2015

Livestock Industry Study

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Minnesota Department of Agriculture

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Pursuant to Minn. Stat. § 3.197, the cost of preparing this report was approximately $22,750.

Executive Summary

This Livestock Industry Study is the result of action taken by the 2015 Minnesota Legislature and signed into law by Governor Mark Dayton.

> *The commissioner of agriculture must identify causes of the relative growth or decline in the number of head of poultry and livestock produced in Minnesota, Iowa, North Dakota, South Dakota, Wisconsin, and Nebraska over the last ten years, including but not limited to the impact of nuisance conditions and lawsuits filed against poultry or livestock farms. No later than February 1, 2016, the commissioner must report findings by poultry and livestock sector and provide recommendations on how to strengthen and expand Minnesota animal agriculture to the legislative committee with jurisdiction over agriculture policy and finance.*[1]

Livestock Industry State Comparisons

Minnesota's cow numbers have stabilized and milk production has increased by nearly 1.5 billion pounds since 2005. Over the last ten years, milk production per cow has increased in all six states, while milk cow inventory has increased in all states except Nebraska and North Dakota. A longer view (since 1950) is not as positive with milk cow inventories decreasing in all states. One of the challenges facing Minnesota's dairy industry is the current capacity in milk processing. Most cheese plants are processing at capacity which means producers are not able to sell as much to them. The value of milk produced fluctuated widely over the past 10 years with prices ranging from a low of $10.70 per hundredweight (cwt) to a high of $26.60/cwt in April of 2014.

Hog inventory and pork production in Minnesota experienced a 15 percent increase since 2006, an increase of over one million hogs. Only Iowa's 20 percent increase topped Minnesota's growth over the study period. Nebraska's inventory increased by 8 percent, followed by South Dakota at 7 percent. Two states, North Dakota and Wisconsin, saw decreased hog inventories over the past decade with Wisconsin's 29 percent decrease the most prominent. Minnesota pork production value topped $2.7 billion in 2014 compared to $1.6 billion in 2005, a 177 percent increase.

All states within the study, with the exception of Wisconsin, experienced decreasing numbers of beef cows ranging from 4 percent to 10 percent. Minnesota's inventory decreased by 10 percent, while Wisconsin's increased by 10 percent. One of the reasons for the decline is competition for marginal and grazing acres, a factor in all six target states. The United States has seen the lowest beef cow inventory since the 1950s which directly reflects on the number of calves being fed and marketed. The number of cattle on feed marketed is split with inventories in Minnesota, Iowa, and Wisconsin increasing between 3 percent and 33 percent, while Nebraska, South Dakota, and North Dakota are decreasing by 3 percent, 4 percent, and 27 percent, respectively.

As the nation's number one turkey producer, Minnesota's annual production has remained fairly constant over the past 10 to 15 years at 44-46 million head. Iowa's annual turkey production has increased from 8.5 million head in 2005 to 10.5 million in 2014. South Dakota's turkey production has been fairly stable at 4.0 to 4.7 million head annually. Turkey production is dependent on the capacity of processors and few, if any, new processors or major expansions have been noted over the study period. The poultry industry is vertically integrated (one company operates two or more stages of production normally operated by separate companies) and there are a number of independent growers who have a marketing agreement to market their poultry. With the exception of some backyard flocks raised for personal consumption and local direct marketing, many poultry farmers now have contracts to raise birds for the processors. Jennie-O Turkey Store, GNP Company (formerly Gold'n Plump Poultry), Willmar Poultry Company, Michael Foods, Inc., Sparboe Co LLC and Rembrandt Enterprises Inc. are a few Minnesota- based companies.

Egg production data showed an increase in all states except North Dakota where no data were available. Iowa leads the nation with 16.5 billion eggs produced annually and has increased 14 percent since 2008.

Total sheep inventories have steadily declined in all six states since 1950 while the number of sheep per farm has increased. Iowa and South Dakota lead in sheep inventories while Iowa and Minnesota have the greatest number of farms with sheep.

[1] 1st Special Session Laws 2015 Ch. 4, Art. 2, Sec. 83

There are three main goat sectors: meat, dairy and angora. The meat goat inventory decreased in four of the six study states since 2008, including Minnesota, Iowa, North Dakota, and Nebraska. Dairy goat numbers increased in all six states. Angora goats (raised for the hair) are a very small percentage of the U.S. goat herd.

Change Factors

There are many factors that may be considered drivers of change within the livestock industry, including labor availability; location and quantity of processing plants; availability of water; significant weather events (e.g. drought); economic factors such as land and feed prices (including bi-products from ethanol and bio-diesel processing plants); domestic and international market conditions and export demand; the regulatory environment; and nuisance conditions and lawsuits.

Important factors in growing or declining livestock numbers include the changing pattern of where homegrown feeds and fodders are raised. Corn and soybean production has increased in all six states over the last 10 years, and record-level harvests continue to occur. Demographic changes such as the increasing average age of principal farm owners and decreasing farm numbers have occurred nationwide – the six study states are no exception. These are indirect but important considerations for possible policy change.

An analysis of environmental review for the permitting and zoning of livestock operations in the target states found the following:

- Some of the requirements specific to permitting livestock facilities are on a level playing field at the federal level. In some instances, Minnesota may add an additional level of environmental review not seen in other states, with increased permitting costs as a result.
- Local zoning control is more prominent in Minnesota, especially at the township level, than in neighboring states.
- In Minnesota, nuisance complaints by county are proportionately higher as the number of feedlots increases. Citizen complaints regarding livestock include, but are not limited to, manure runoff, loose animals, and bad odors.
- Legislatures in every state have passed Right-to-Farm laws which are designed, in the broadest sense, to protect an agricultural operation from facing a nuisance lawsuit if certain criteria are met.
- In comparing the Right-to-Farm laws of the six target states, other than North and South Dakota, few similarities exist. Minnesota is the only state to address animal feedlots, excluding them from protection under the legislation if they are over a certain size. North Dakota is the first state to go beyond the Right-to-Farm law in protecting farmers and ranchers with the passing of the Farming and Ranching Amendment in 2012. Wisconsin's requirement that an agricultural practice be a substantial threat to public health or safety in a nuisance action appears to eliminate a cause of action for private nuisance. Minnesota, North Dakota, South Dakota, and Iowa address a time-in-operation requirement, while Wisconsin and Nebraska do not.
- Other states do offer some financial and technical assistance to livestock farmers, but based on the information collected, the other states have some programs similar to what Minnesota offers while others offer very little assistance.

Recommendations

Minnesota should continue its regulatory efforts to protect the environment and natural resources. Crop and livestock producers should be encouraged to continue to follow recommended guidelines and standards and Best Management Practices (BMPs) that provide optimum health and growth of their livestock and crops. The environmental review process should seek a balance that includes public input and involvement. Projects that meet these standards should be encouraged to proceed. The following recommendations are presented:

- Ensure the success of Minnesota's livestock industry by encouraging processors to modernize and/or expand their operations to meet the growing market needs of the industry.
- Support the dairy processing infrastructure by stimulating investments in cheese processing capacity and boosting demand for fluid/soft dairy products. This would help to address the impending oversupply of milk in Minnesota.
- Fund programs that provide capital, low-interest loans and grants to young and beginning farmers or those considering an intergenerational transition of their farm.
- Fund educational programs that train and teach tomorrow's agricultural professionals, in particular large animal veterinarians who provide critical services to livestock farmers.
- Explore how state and federal agencies could allow the use of more conservation acres as "working lands" and combine protection for wildlife and habitat with a source of feedstuffs for livestock using proper grazing management practices.
- Support local ordinances that are fair, reasonable, recognize landowner property rights, and that seek solutions which allow for both livestock production and protection of the environment.
- Continue to fund Minnesota Department of Agriculture programs that provide beneficial financial and technical resources to both producers and processers.
- Increase the permitting process assistance provided to livestock producers, a service that has been successful in the other five states.

Introduction

This Livestock Industry Study is the result of action taken by the 2015 Minnesota Legislature and signed into law by Governor Mark Dayton.

> *The commissioner of agriculture must identify causes of the relative growth or decline in the number of head of poultry and livestock produced in Minnesota, Iowa, North Dakota, South Dakota, Wisconsin, and Nebraska over the last ten years, including but not limited to the impact of nuisance conditions and lawsuits filed against poultry or livestock farms. No later than February 1, 2016, the commissioner must report findings by poultry and livestock sector and provide recommendations on how to strengthen and expand Minnesota animal agriculture to the legislative committee with jurisdiction over agriculture policy and finance.*[2]

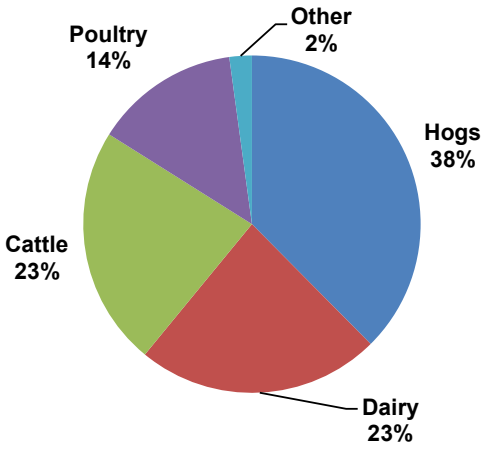
The livestock industry is a vital sector of Minnesota's economy. In 2014, livestock cash receipts totaled $9.6 billion and represented half of the $19.1 billion in the state's total agricultural cash receipts. Among U.S. states, Minnesota ranks first in turkey production, third in hogs, sixth in red meat production, seventh in milk cows and cattle on feed, and eighth in milk production. Furthermore, livestock cash receipts have nearly doubled in the past 10 years, up from $5 billion in 2005.

The landscape of the livestock industry has changed dramatically over the past ten years. In the summer of 2015, the Minnesota Legislature directed the Minnesota Department of Agriculture (MDA) to conduct an all-species assessment of the relative growth or decline of livestock in the state compared to the neighboring states of Iowa, North Dakota, South Dakota, Wisconsin, and Nebraska. The livestock sectors included in this study are dairy, cattle, hogs, poultry, sheep and goats.

Using the latest data available for each livestock sector, the study addresses the following questions: Is Minnesota's livestock industry keeping pace with neighboring states? Which sectors, including dairy, cattle, hogs, poultry, sheep and goats, are growing and which ones are declining? The study also examines factors that have implications for the livestock industry including regulatory issues, zoning laws, processing facilities, the availability of feedstock, and demographic trends.

Of all the data and comparisons made in this Livestock Study, two important points should be noted.

Chart 1. Minnesota livestock cash receipts by sector (2014)

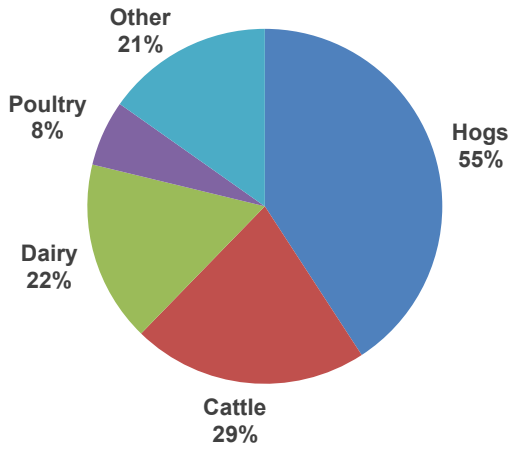


Source: Bureau of Economic Analysis

First, Minnesota's diverse livestock sector is unique to all other states in the study and possibly the entire United States. Where one state may be strong in one sector and lacking in another livestock species, Minnesota has strong livestock numbers in several species, as shown in Chart 1, with operations of all sizes and business models.

[2] 1st Special Session Laws 2015 Ch. 4, Art. 2, Sec. 83

Chart 2. Six-state percentage of U.S. livestock cash receipts by sector (2014)



Source: Bureau of Economic Analysis

Second, this six-state area produces over 55 percent of all pork in the U.S, 29 percent of the beef, 22 percent of the dairy and 8 percent of the poultry as shown in Chart 2.

Livestock Inventory

Dairy Industry

Dr. Marin Bozic of the University of Minnesota summarized dairy trends between 1992 and 2014, showing a decline in Minnesota milk production of 7.4 percent from 9.85 billion lbs. to 9.13 billion lbs. Over the same period, milk production in the neighboring states of Wisconsin, Iowa and South Dakota increased by 16 percent, 16.5 percent and 27 percent respectively. Pennsylvania and Vermont, two northeast states characterized by small average herd size similar to Minnesota, also grew by 3.2 percent and 6.1 percent respectively. The fastest growing state in the Midwest/ Northeast belt was Michigan with 77 percent growth between 1992 and 2014.[3]

Between 1992 and 2014, the number of dairy farms in Minnesota decreased by 76 percent – from 14,000 to 3,500 – while average herd size nearly tripled from 47 to 129 cows per farm. In 1993, milk production per cow in Minnesota was 15,255 lbs., 345 lbs. higher than cow productivity in Wisconsin, and 135 lbs. higher than Iowa. By 2014, Minnesota's yield at 19,845 lbs. was trailing Wisconsin by 2,030 lbs. and Iowa by 2,640 lbs. In comparison, Michigan's milk production per cow was 1,120 lbs. higher in 1992 and was 4,785 lbs./yr. in 2014.

While the data presented above paint the picture of dairy decline in Minnesota, in reality the dairy production trends changed in the mid-2000s and Minnesota milk production increased by nearly 1.5 billion lbs. between 2004 and 2015. Long-term excess dairy processing capacity had rendered the Upper Midwest a sellers' market for milk, characterized by small production growth, under-utilized processing capacity and high milk price premiums. This situation was not stable; however, and a combination of attrition of dairy processing capacity, strong regional increases in milk production since 2013, and decrease in demand for beverage milk, has altered the landscape in the last year and a half.

Table 1 shows the average milk production per cow over the last 10 years. Per cow production increased in all six states between 5 percent and 34 percent. North Dakota experienced the largest increase at 34 percent while Iowa's increase was 5 percent. Minnesota per cow production increased 11 percent from 17,815 lbs./cow in 2005 to 19,841 lbs./cow in 2014.

[3] Bozic, M. and J. Clark. 2015. Situation in the Dairy Processing Sector in Minnesota. The National Program on Dairy Markets and Policy, Briefing Paper 15-02. URL: http://dairymarkets.org/PubPod/Pubs/BP15-02.pdf

Table 1. Milk production per cow in pounds, 2005-2014

Year	Minnesota	Iowa	North Dakota	South Dakota	Wisconsin	Nebraska
2005	17,815	21,524	14,182	17,963	18,515	17,656
2006	18,598	20,630	14,242	18,580	18,869	18,633
2007	19,024	20,371	14,800	20,259	19,341	17,917
2008	18,968	19,702	16,077	20,884	19,578	19,000
2009	19,271	20,005	15,480	20,128	20,111	20,305
2010	19,366	20,195	18,286	20,258	20,663	19,797
2011	18,915	20,586	17,250	20,811	20,599	20,224
2012	19,512	22,015	19,278	21,867	21,521	21,179
2013	19,652	22,473	18,944	21,989	21,710	21,182
2014	19,841	22,663	19,059	22,200	21,886	22,547

Source: USDA, National Agricultural Statistics Service

Economic factors relevant for dairy production, such as availability of water, quality feed, dairy-related infrastructure, availability of labor, etc., are not substantially different across Upper Midwest states. The difference in relative growth of the dairy sectors in the Upper Midwest states, despite similar economic factors, suggests that a state's investment in public policy in support of dairy can have meaningful impact on the success of the dairy sector. In the past 10 years, Wisconsin and South Dakota have invested in the growth of their dairy farm numbers as shown in Table 2. The most pressing issue Minnesota's dairy sector is facing is no longer the sluggish milk supply, but bottlenecks in milk processing capacity. More information on milk processing is found in the *Livestock and Milk Processing* section of this report.

Table 2. January 1 Milk Cow inventory, 2006-2015

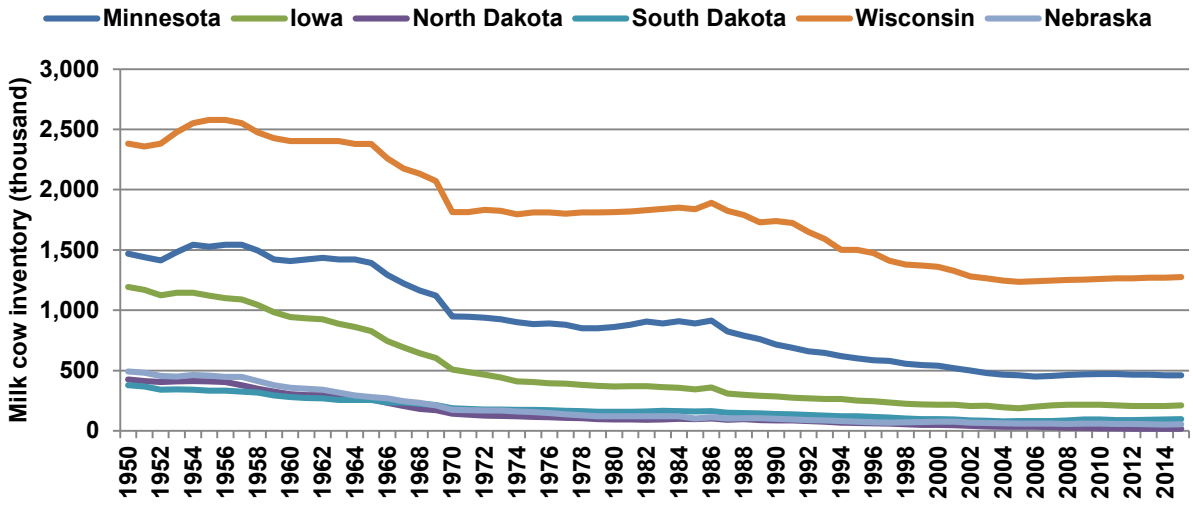
Year	Minnesota	Iowa	North Dakota	South Dakota	Wisconsin	Nebraska
2006	450,000	200,000	33,000	81,000	1,240,000	60,000
2007	455,000	210,000	30,000	81,000	1,245,000	60,000
2008	463,000	215,000	26,000	86,000	1,250,000	57,000
2009	468,000	215,000	25,000	94,000	1,255,000	59,000
2010	470,000	215,000	21,000	93,000	1,260,000	59,000
2011	470,000	210,000	20,000	90,000	1,265,000	58,000
2012	465,000	205,000	18,000	90,000	1,265,000	56,000
2013	465,000	205,000	18,000	92,000	1,270,000	55,000
2014	460,000	205,000	17,000	95,000	1,270,000	53,000
2015	460,000	210,000	16,000	98,000	1,275,000	54,000

Source: USDA, NASS

Wisconsin has the largest dairy cow inventory in the six-state region and the second largest inventory in the nation behind California. In the past ten years, Wisconsin cow inventory has increased 3 percent, from 1.24 million in 2006 to 1.28 million in 2015 as shown in Table 2. Minnesota and Iowa have the next largest population of dairy cows with 460,000 and 210,000, respectively, increases of 2 percent and 5 percent, respectively. The largest increase occurred in South Dakota at 21 percent. North Dakota and Nebraska inventories decreased by 52 percent and 10 percent, respectively.

Since 1950 there has been a sharp decline in milk cow inventory in all six states, as shown in Chart 3. Inventory levels dropped over 50 percent in all states except Wisconsin, which declined 46 percent. The largest decreases occurred in North Dakota (96 percent), Nebraska (89 percent) and Iowa (82 percent). Minnesota experienced a 69 percent inventory decline, from 1.47 million to 460,000 milk cows. In the past ten years, dairy cattle numbers have grown and now stabilized to 460,000 milk cows.

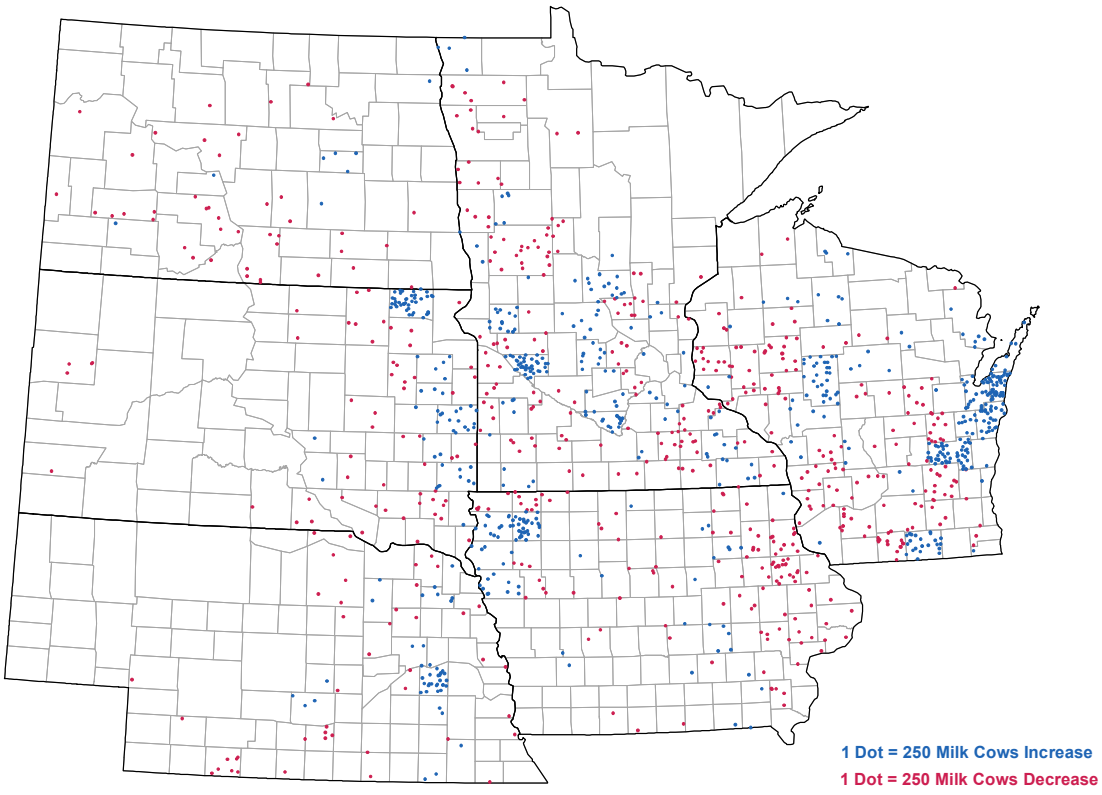
Chart 3. Milk cow inventory, 1950-2015



Source: USDA, NASS

The 2012 U.S. Census of Agriculture depicts the change in milk cow inventory from 2007-2012 as seen in Map 1. Milk cow increases can be seen along the Interstate 29 corridor in South Dakota, west-central Minnesota, northwest Iowa, southeast Nebraska and east-central Wisconsin.

Map 1. Milk cow change in inventory, 2007-2012



Source: USDA Agricultural Census, 2012

Hog Industry

Of the six states examined, four experienced increases in hog inventories since 2006 (Minnesota, Iowa, South Dakota and Nebraska) and two experienced decreases (North Dakota and Wisconsin) as illustrated in Table 3 shown on the next page. Iowa is the top hog producer in the nation with 20.8 million hogs. Iowa's hog inventory increased 20 percent since 2006. Minnesota's hog inventory is 7.95 million, an increase of 15 percent – or over 1 million hogs – during the same period. Nebraska's hog inventory increased 8 percent to 3.30 million hogs and South Dakota's increased 7 percent. North Dakota and Wisconsin inventories decreased 29 percent and 18 percent, respectively.

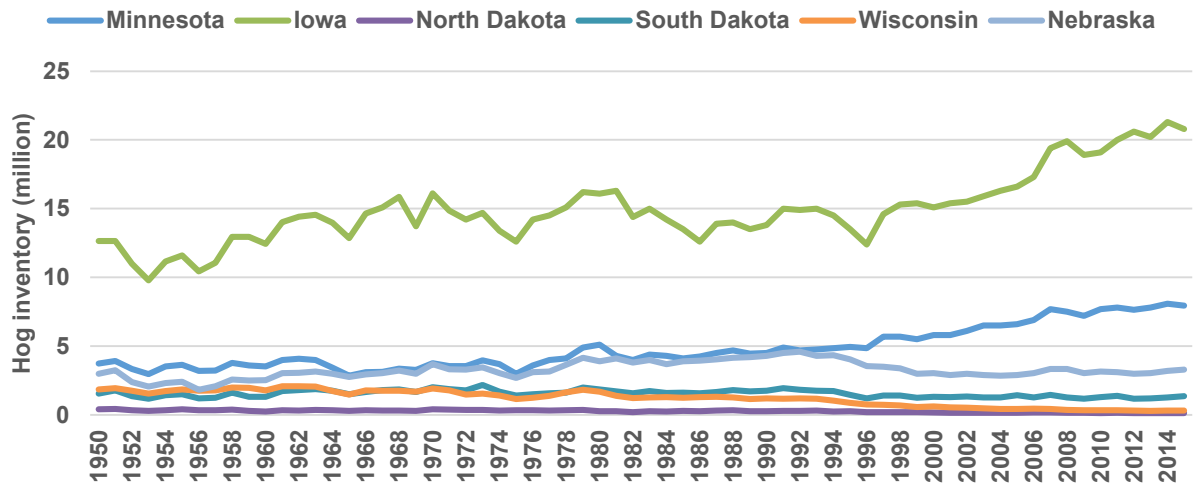
Table 3. December 1 Hog inventory, 2006-2015

Year	Minnesota	Iowa	North Dakota	South Dakota	Wisconsin	Nebraska
2006	6,900,000	17,300,000	169,000	1,270,000	450,000	3,050,000
2007	7,700,000	19,400,000	182,000	1,460,000	440,000	3,350,000
2008	7,500,000	19,900,000	151,000	1,280,000	360,000	3,350,000
2009	7,200,000	18,900,000	155,000	1,180,000	350,000	3,050,000
2010	7,700,000	19,100,000	143,000	1,290,000	330,000	3,150,000
2011	7,800,000	20,000,000	149,000	1,390,000	340,000	3,100,000
2012	7,650,000	20,600,000	135,000	1,190,000	320,000	3,000,000
2013	7,800,000	20,200,000	135,000	1,200,000	295,000	3,050,000
2014	8,100,000	21,300,000	138,000	1,270,000	300,000	3,200,000
2015	7,950,000	20,800,000	138,000	1,360,000	320,000	3,300,000

Source: USDA, NASS

Since 1950, states with the largest inventories (Iowa, Minnesota, and Nebraska) experienced an inventory increase as shown in Chart 4. Iowa's hog inventory increased 65 percent with the greatest growth since 1996. Minnesota's hog inventory more than doubled with a steeper increase since 1996. Nebraska, the third largest hog state, increased its inventory by 10 percent during that period.

Chart 4. Hog inventory, 1950-2015



Source: USDA, NASS

Fifty-five percent of the nation's pork comes from the six states in the target area. The trend for split-site (breeding, grower, and finisher operations) operations is found in all states as bio-security is increasingly important. One of the important factors in today's pork industry is the difference between sow-to-wean operations and hog finishers in terms of economic impact. A 2,500-head sow (breed)-to-wean operation employs about 10 full-time employees (FTE's) while the same size (2,500 head) finisher employs .5 FTE, illustrating the impact a sow operation can have on a local economy. The most economical size of newly constructed sow farms today is 5,000 head which can fill a 2,500-head finishing site with one week of production.

Hog production value increased in all six states between 2005 and 2014. Iowa experienced the largest increase of 222 percent, while Wisconsin had the lowest increase of 9 percent as shown in Table 4. Unsurprisingly, production value closely follows inventory.

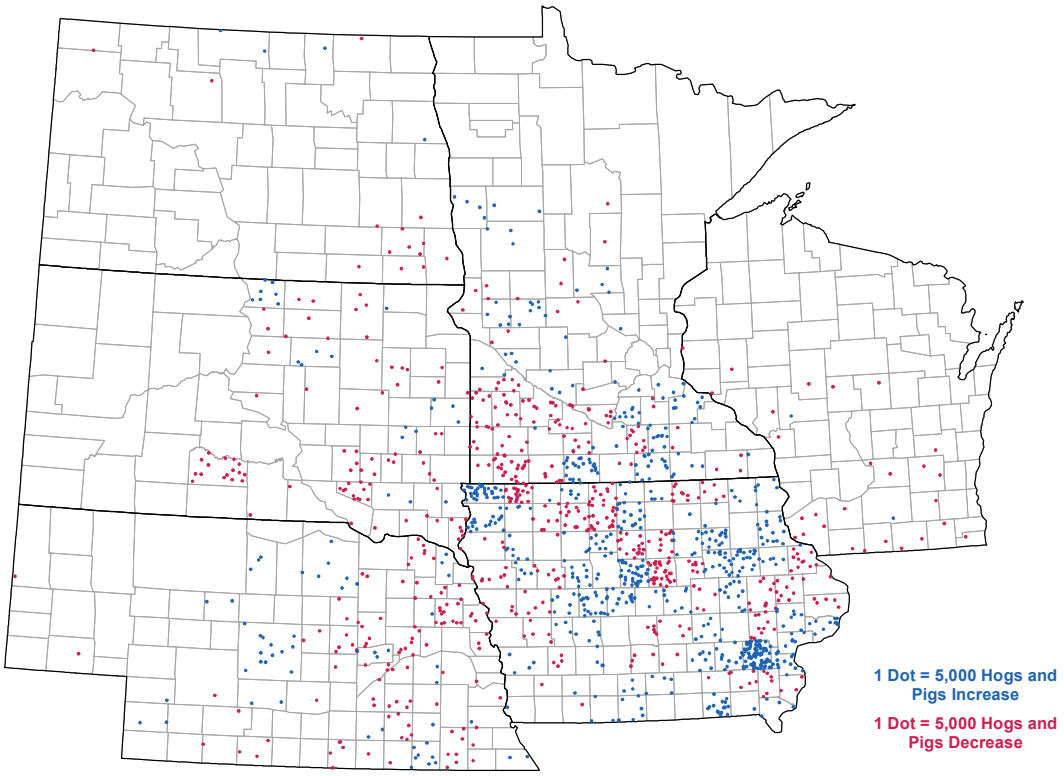
Table 4. Hog production, $, 2005-2014

Year	Minnesota	Iowa	North Dakota	South Dakota	Wisconsin	Nebraska
2005	1,570,936,000	3,617,637,000	41,532,000	331,308,000	112,235,000	727,650,000
2006	1,501,906,000	3,417,443,000	37,696,000	347,125,000	105,652,000	699,144,000
2007	1,645,781,000	3,632,366,000	35,825,000	320,577,000	108,595,000	727,299,000
2008	1,757,315,000	4,029,267,000	35,474,000	348,707,000	107,923,000	710,448,000
2009	1,246,087,000	3,582,445,000	39,733,000	292,574,000	90,766,000	622,442,000
2010	1,848,944,000	4,503,113,000	51,177,000	417,399,000	110,277,000	800,932,000
2011	2,296,476,000	5,926,789,000	56,408,000	529,653,000	135,219,000	913,304,000
2012	2,410,425,000	6,174,367,000	46,692,000	532,239,000	122,921,000	842,576,000
2013	2,522,978,000	6,890,501,000	52,400,000	503,056,000	128,999,000	844,760,000
2014	2,784,251,000	8,017,968,000	66,738,000	537,480,000	122,235,000	1,004,858,000

Source: USDA, NASS

The 2012 U.S. Census of Agriculture depicts the change in hog inventory from 2007-2012 as shown in Map 2. Operations expanded further north in Minnesota and declined overall in Wisconsin and North Dakota. Iowa experienced clusters of both growth and loss throughout the state.

Map 2. Change in hog inventory, 2007 to 2012



Source: USDA Agricultural Census, 2012

Beef Industry

Beef inventory in the target states is a combined total of beef cows raised on pasture or marginal land and cattle on feed, usually raised in feedlots. Cattle finished to market weight may be purchased locally or from other regions of the country.

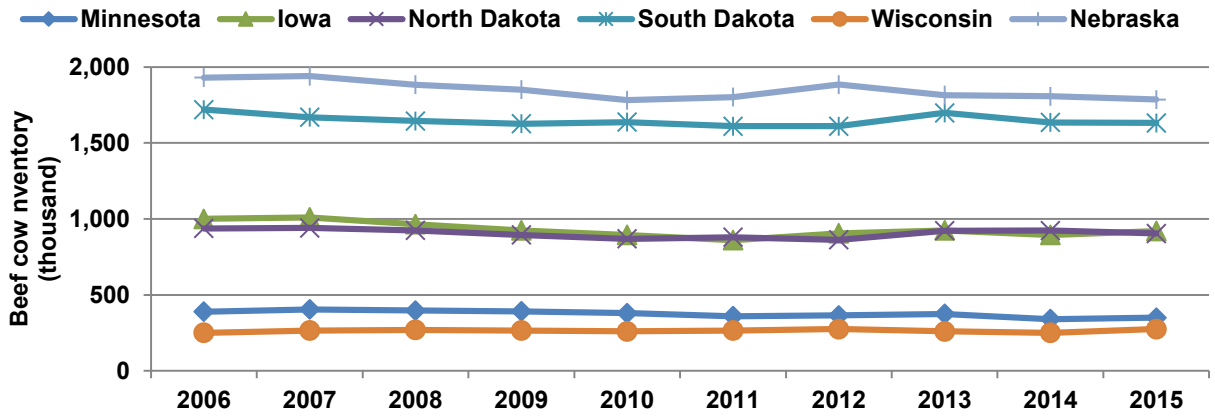
Over the last decade, rising crop prices have led to the conversion of some marginal lands previously used for raising beef cows, to crop production. Competition for these marginal and grazing acres has been a factor in all of the six target states. While total beef cow numbers are declining, the average beef cow herd size gradually increased. Over 85 percent of the beef cow producers in Minnesota have fewer than 50 head and operate on nearly 1.4 million acres. Minnesota has nearly 13,500 cow/calf ranchers and about 350,000 beef cows, according to the USDA, National Agricultural Statistics Service (NASS).

The United States has seen the lowest beef cow inventory since the 1950s which directly reflects on the number of calves being fed and marketed. Some regions of the country have seen severe droughts (West and Southwest) while blizzards and flooding in the six target states impacted beef cow inventories. Currently, the trend is for beef cow producers to consider keeping additional heifer replacements as the slow process of rebuilding herds is underway. This process takes several years as heifer calves grow, but won't produce their first calf until two years of age.

Average feedlot size has gradually increased since 2006 while the number of cattle feeding operations has steadily declined. In 2015, Minnesota had 2,400 feedlots with a one-time feeding capacity of 300,000 head with 500,000 head finished annually. About 175,000 dairy steers from Minnesota's dairy industry are also fed in Minnesota feedlots.

All states within the study, with the exception of Wisconsin, have experienced declines in beef cow numbers since 2006, as seen in Chart 5. Declines ranged from 4 percent to 10 percent with Minnesota's inventory decreasing by 10 percent. Nebraska and South Dakota, states with the largest inventories, decreased by 7 percent and 5 percent, respectively. Wisconsin increased beef cow inventory by 10 percent.

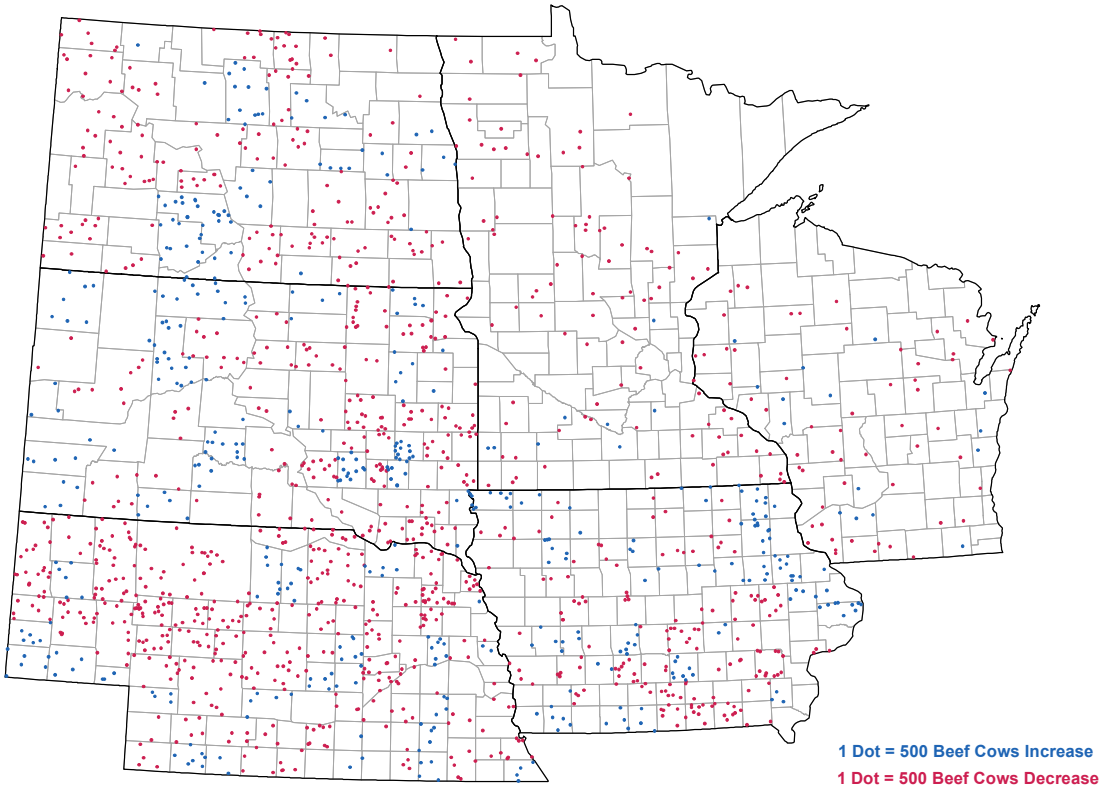
Chart 5. Beef cow inventory, 2006-2015



Source: USDA, NASS

Map 3 shows the change in beef cattle inventory from 2007 to 2012. The inventory loss can be seen particularly in Minnesota and western North Dakota. Areas of both growth and loss are relatively uniform and not limited to one region or state.

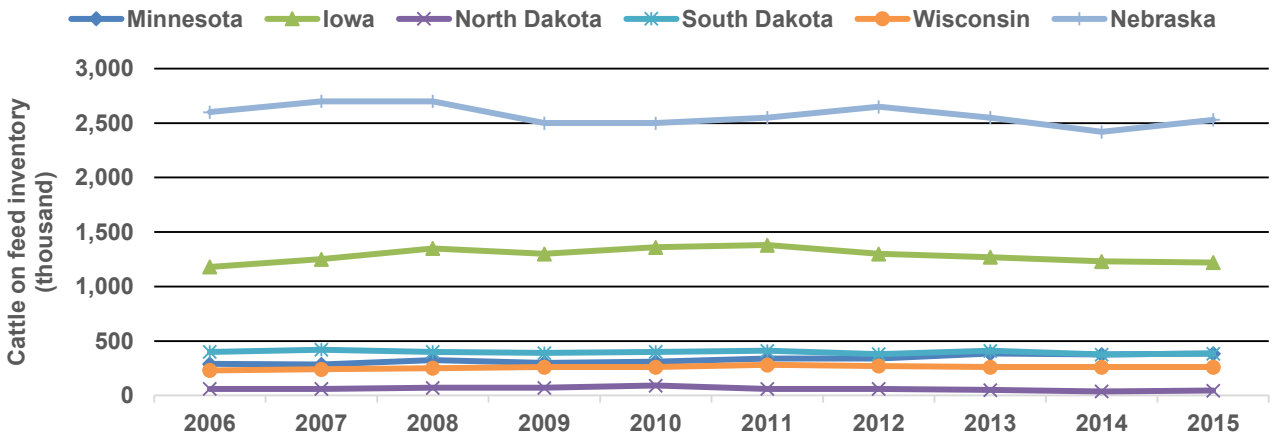
Map 3. Change in beef cattle inventory, 2007-2012



Source: USDA Agricultural Census, 2012

Nebraska has seen the greatest increase in number of cattle on feed per farm/feedlot since 1950. The number of cattle on feed marketed and the total number of all classes of cattle marketed increased in Nebraska, with Iowa showing a significant drop, and the remaining states staying relatively consistent, as shown in Chart 6.

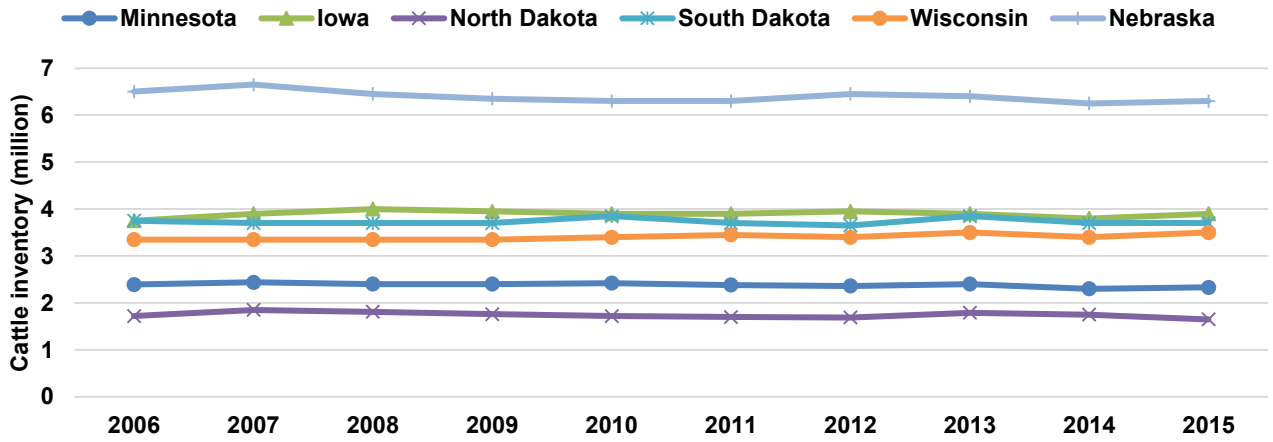
Chart 6. Cattle on Feed inventory, 2006-2015



Source: USDA, NASS

Since 2006, overall cattle inventory (includes both types of beef and dairy cattle) decreased in Minnesota, Nebraska, South Dakota, and North Dakota by 1 percent to 4 percent (Chart 7). Inventory increased in Iowa and Wisconsin, both by 4 percent. In 2015 Nebraska had the largest all cattle inventory at 6.3 million head, dropping 3 percent from 2006.

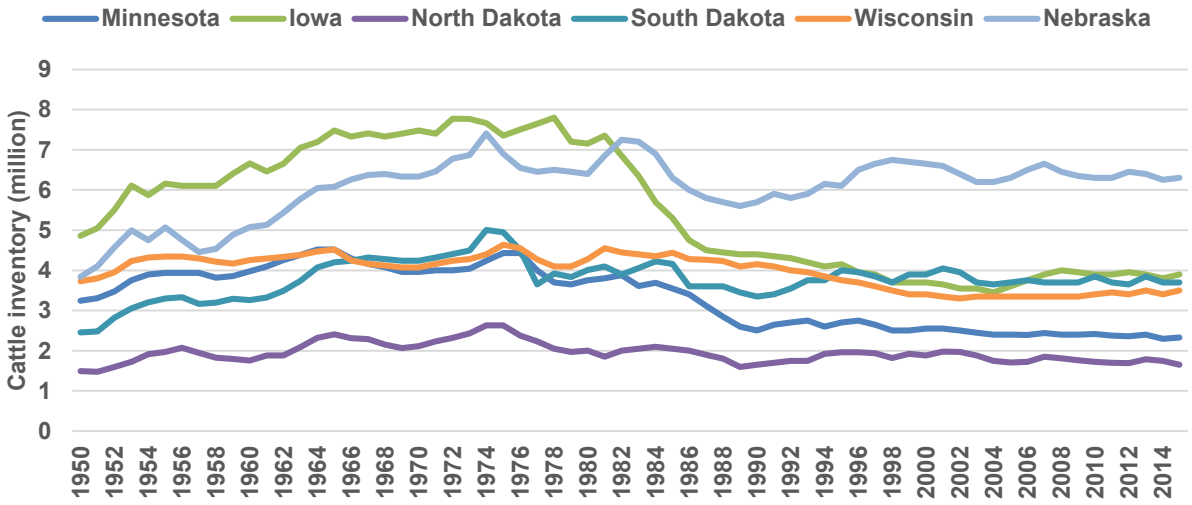
Chart 7. All cattle inventory, 2006-2015



Source: USDA, NASS

The long-range cattle trend shows a mixed picture among the six states. Nebraska has the largest cattle inventory which increased 64 percent since 1950 (Chart 8). Iowa's cattle inventory decreased 20 percent, while South Dakota's increased 51 percent. Wisconsin's inventory decreased 6 percent. Minnesota's inventory decreased 28 percent from 3.24 million in 1950 to 2.33 million in 2015.

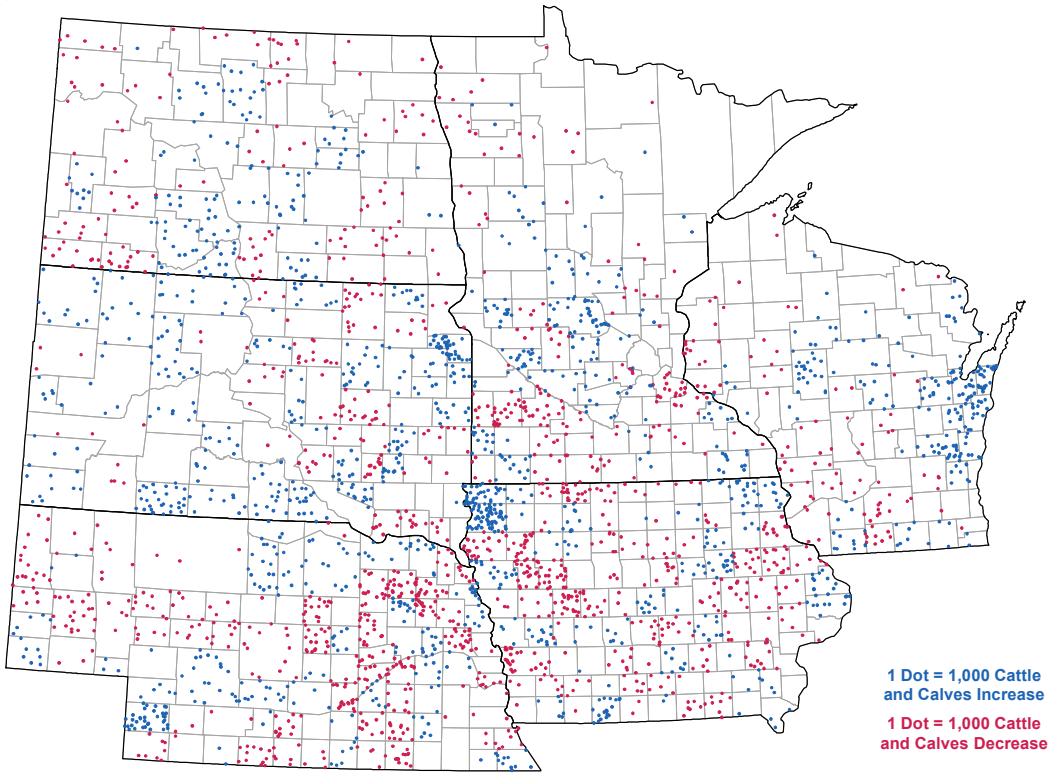
Chart 8. Cattle inventory, 1950-2015



Source: USDA, NASS

Map 4 shows the change in all cattle inventory from 2007 to 2012. Areas of large change, both increases and decreases, are seen in pockets in northwest Iowa, northeast South Dakota, southwestern Nebraska, and eastern Wisconsin.

Map 4. Change in all cattle inventory, 2007-2012

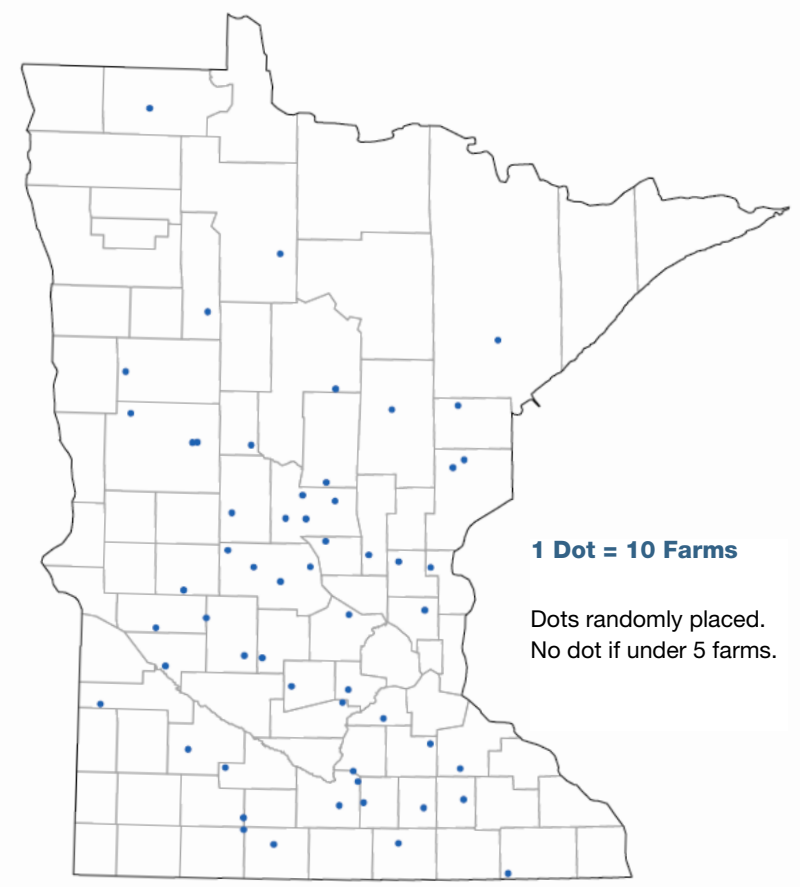


Source: USDA Agricultural Census, 2012

Poultry Industry

The poultry industry is vertically integrated and there are a number of independent growers that have marketing agreements to market their poultry. With the exception of some backyard flocks raised for personal consumption and local direct marketing, many poultry farmers now have contracts to raise birds for the processors. Jennie-O Turkey Store, GNP Company (formerly Gold'n Plump Poultry Inc.), Willmar Poultry Company, Michael Foods, Sparboe Co LLC and Rembrandt Enterprises Inc. are a few Minnesota-based companies. Poultry processors tend to keep their source of poultry within a 100-mile radius of their processing facilities in order to reduce transportation costs. This can be seen by the high concentrations of turkey and broiler barns in and near Central Minnesota. Farms with turkey inventory are shown by Map 5. North Dakota poultry data has been combined with other U.S. states to avoid disclosing individual operations.

Map 5. Farms with turkey inventory, 2012

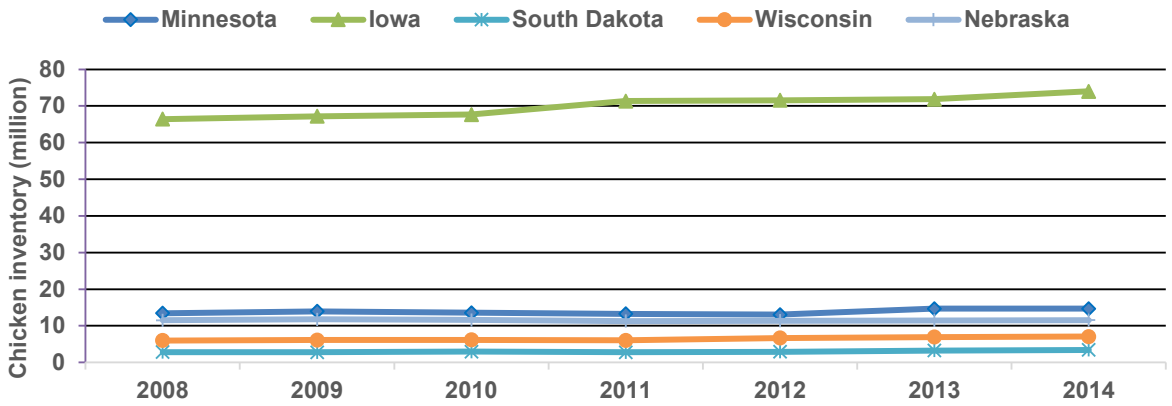


Source: USDA, National Agricultural Statistics Service

Nearly every state in the target area sustained losses during the 2015 High Path Avian Influenza (HPAI) outbreak. Of the 219 cases of avian flu in 15 states, Minnesota and Iowa were hit the hardest with over 80 percent of all cases and 85 percent of the lost birds. In Minnesota, 108 farms in 23 counties were affected with over 9 million birds dying from the virus or being depopulated as required by USDA – including commercial turkey, commercial layers, and one backyard flock.

Iowa, Minnesota, Wisconsin, and South Dakota have all seen growth in the poultry industry since 2008. Chicken inventories, excluding broilers, increased or held steady in all the study states (except North Dakota where data were combined with other states) as shown in Chart 9. Iowa has the largest chicken inventory, increasing 11 percent since 2008 to 74 million birds in 2014. Minnesota increased 9 percent to 14.7 million birds and Nebraska held steady at 11.6 million birds.

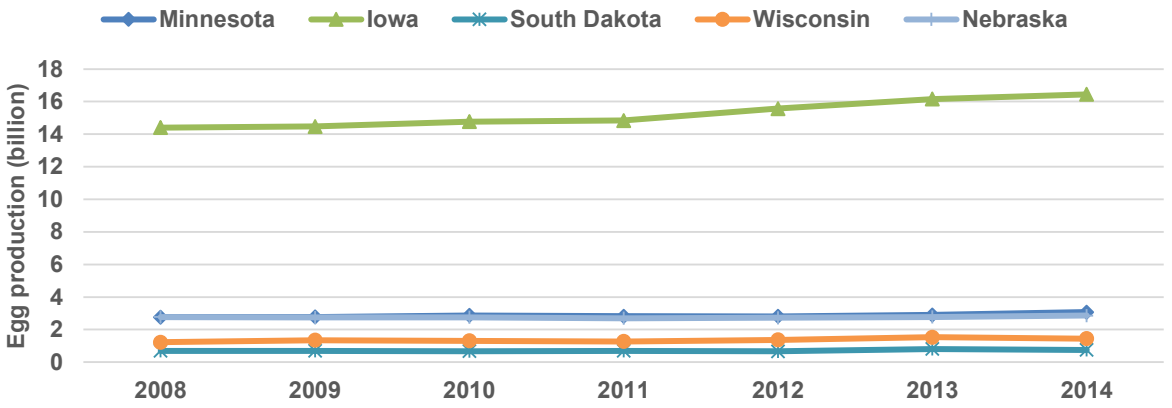
Chart 9. Chicken inventory, 2008-2014



Source: USDA, NASS

Egg production closely follows chicken inventory. Chart 10 shows growth in egg production mirroring chicken inventory. All states increased egg production ranging from 3 percent in Nebraska to 19 percent in Wisconsin. Minnesota increased egg production by 11 percent to 3.07 billion eggs.

Chart 10. Egg production, 2008-2014



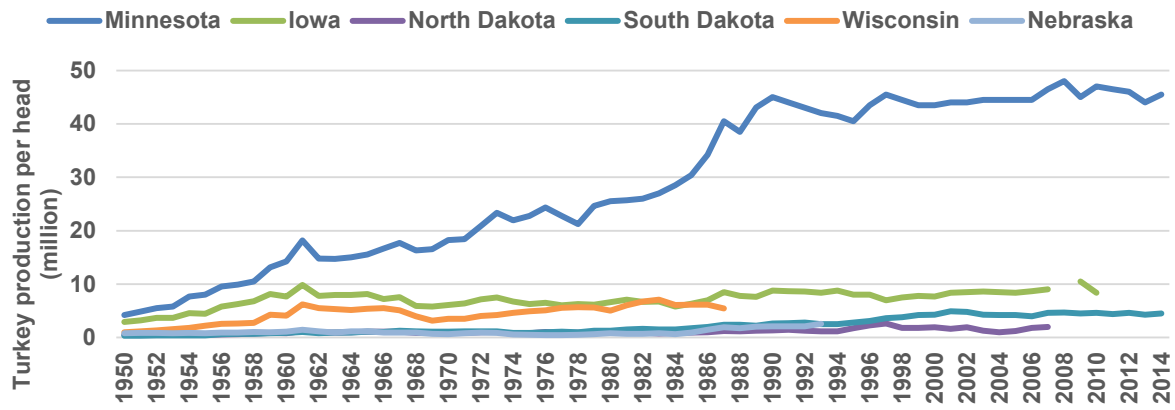
Source: USDA, NASS

Broiler inventory data was limited to Minnesota and Wisconsin and available from 2008 through 2014. Inventories in each state grew by 4 percent and 3 percent, respectively, to 46.8 million and 53.4 million head.

Minnesota is the number one turkey producer in the U.S., and Minnesota farmers raise 44 to 46 million turkeys per year. In 2012, Minnesota had 560 farms reporting turkey inventory according to the U.S. Census of Agriculture, although the number of commercial operations is about 450, according to the Minnesota Turkey Growers Association. Minnesota is home to the world's largest turkey hatchery and second largest turkey processing company.

Chart 11 shows the long-term turkey inventory trend from 1950 to 2014. Data for several states is confidential to avoid disclosing individual operations. Minnesota's turkey inventory grew from 4.21 million in 1950 to 45.5 million in 2014.

Chart 11. Turkey production, 1950-2014

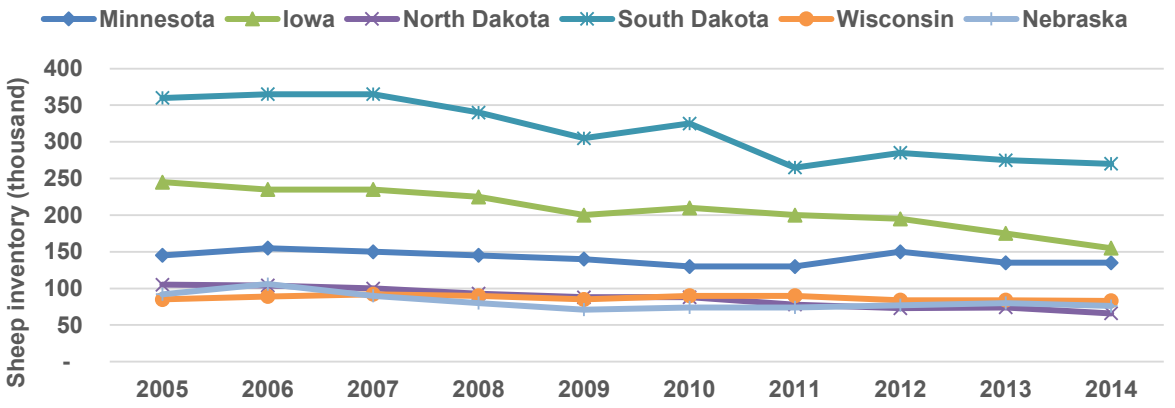


Source: USDA, NASS

Sheep Industry

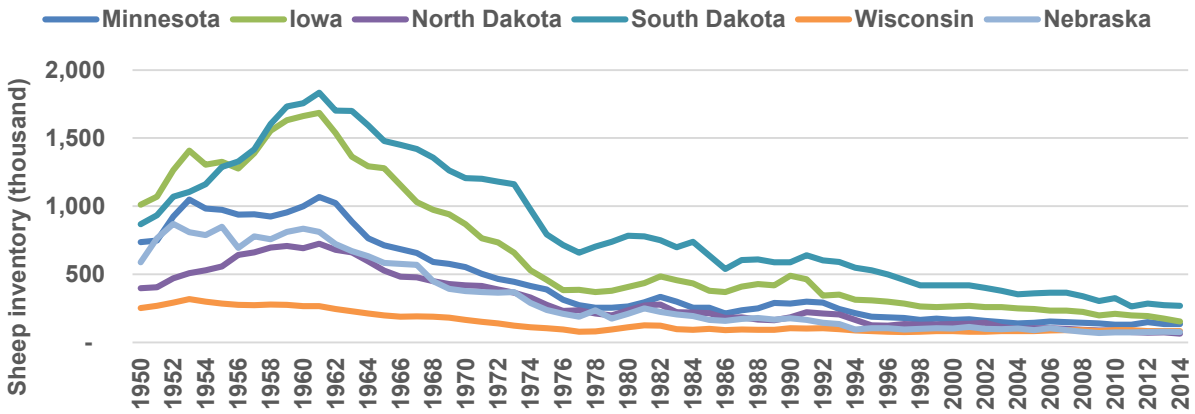
There has been a steady decline of sheep numbers in all six states since 2005 with South Dakota and Iowa leading the six-state region for total inventory of sheep (Chart 12). Total sheep inventories' downward trend started as long as 50 years ago (Chart 13). This is further evident with the decline in the number of sheep farms (Chart 14). While total inventory has declined, sheep per farm has consistently increased. The trend is fewer farms with more animals per farm similar to other livestock species. North Dakota and South Dakota have had larger flock sizes in part due to larger land parcels more conducive to grazing and pasturing versus crop farming.

Chart 12. Total sheep inventory, 2005-2014



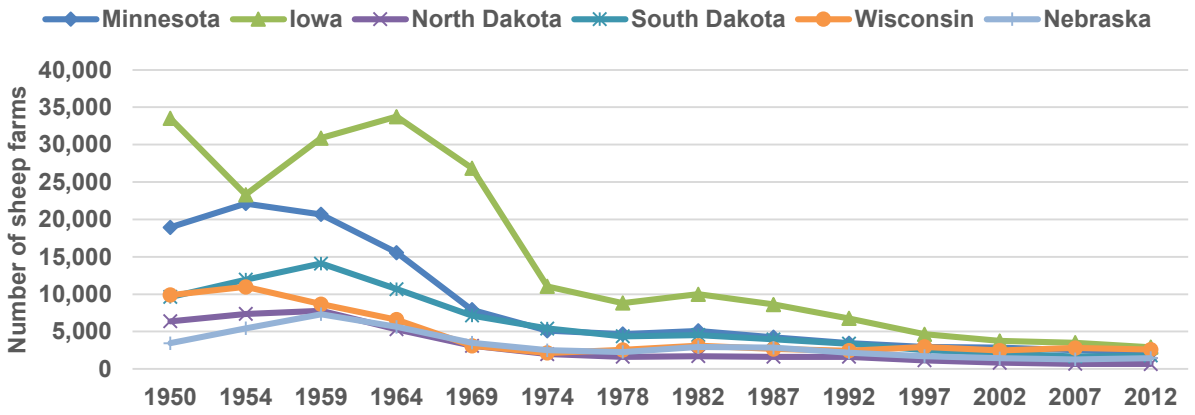
Source: USDA, NASS

Chart 13. Total sheep inventory, 1950-2014



Source: USDA, NASS

Chart 14. Number of sheep farms, 1950-2012



Source: USDA, NASS Census of Agriculture

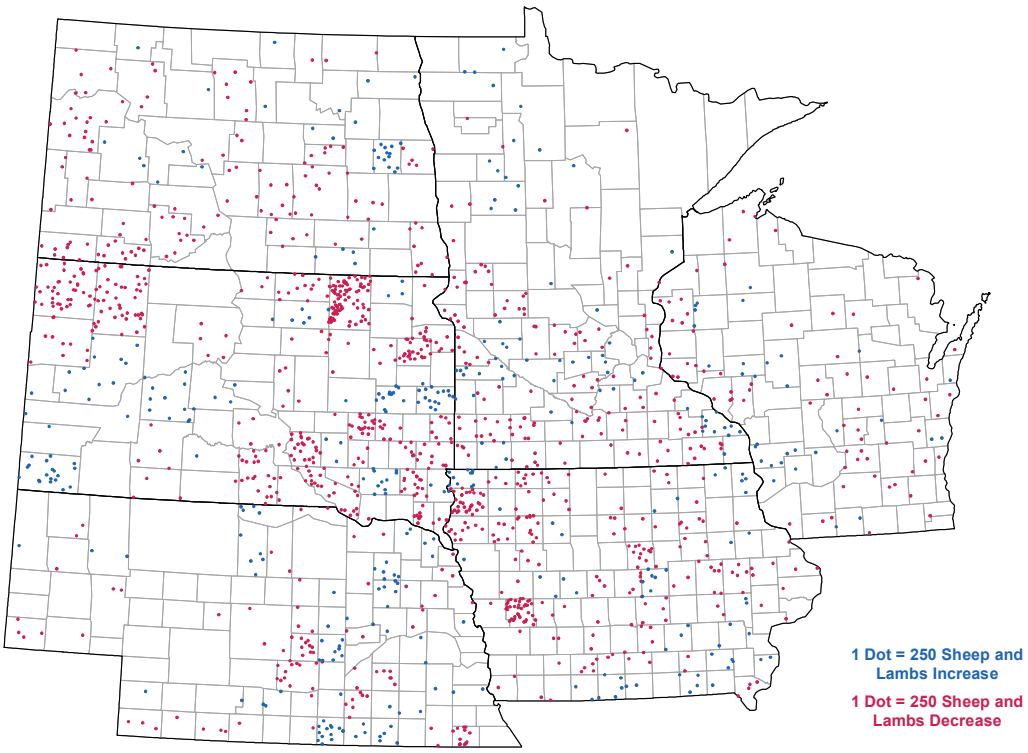
The declining trend is due to the overall change in livestock production from individual farms raising multiple species to becoming more species-specific. Generally speaking sheep are either raised for their wool or for their meat. The Upper Midwest has moved to raising sheep bred for carcass traits but have poor wool qualities. Other regions of the US are noted more for raising breeds that are noted for their wool quality.

There are a number of factors that have led to reductions in the number of sheep farms in the Upper Midwest. Those factors include lack of demand for lamb (less than 1 lb. per person/year); lack of advertising because of the lack of a commodity check-off program; importation of lower-cost lamb from New Zealand; and lack of processing facilities (Greely, CO and Chicago, Ill). The inability to control predators, lack of shearers (Chart 15) and wool buyers, and lack of veterinarians with knowledge about sheep are also factors in the decline of sheep production.

Cultural diversity is one of the factors maintaining the sheep industry especially in the Upper Midwest. Demand for lamb is coming from ethnic markets where lamb is a preferred protein in the diet.

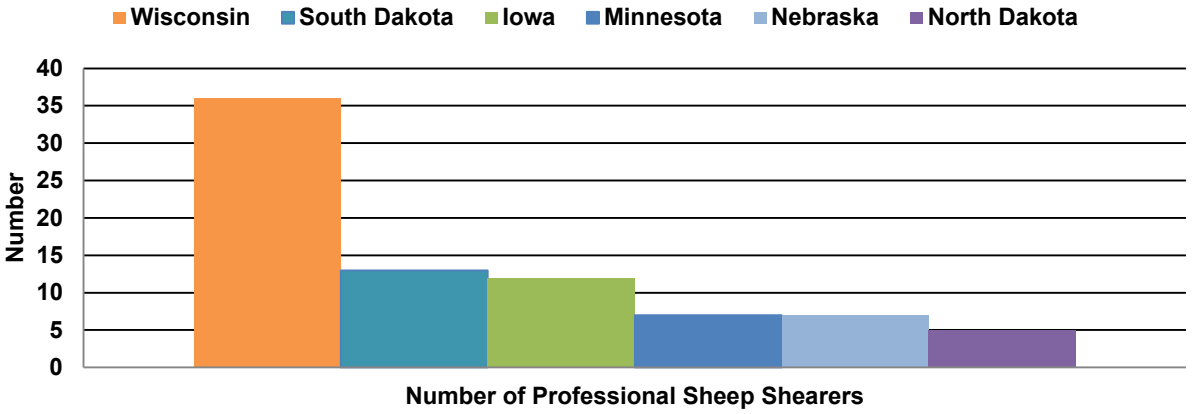
Map 6 shows the change in sheep inventory from 2007 to 2012. Decreases in sheep inventory can be seen in pockets of northwestern and northeastern South Dakota and northwestern and west central Iowa. Other inventory changes are somewhat evenly dispersed throughout the states.

Map 6. Change in sheep inventory: 2007-2012



Source: USDA, NASS Census of Agriculture

Chart 15. Professional sheep shearers

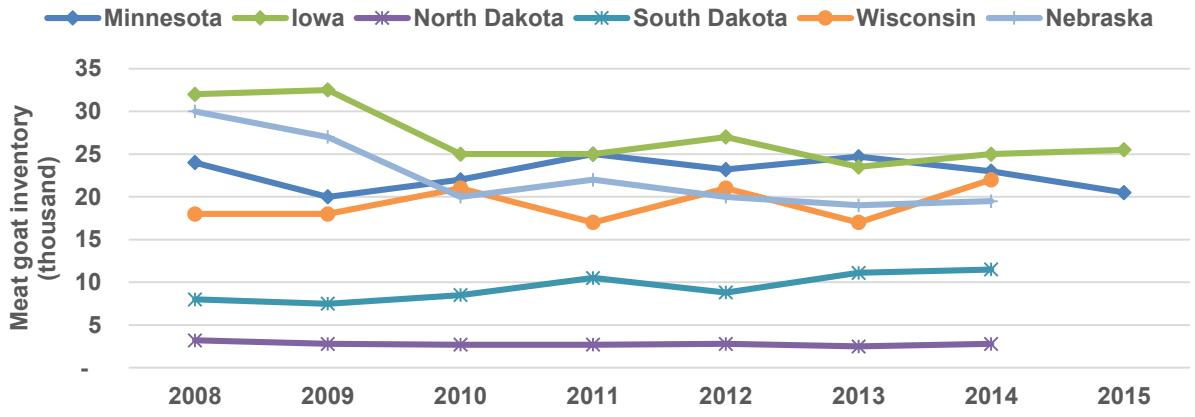


Source: American Sheep Industry Association (ASIA)

Goat Industry

There are three main goat sectors: meat, dairy, and angora. The meat goat inventory decreased in four of the six study states, Minnesota, Iowa, North Dakota, and Nebraska, since 2008, the latest data available. Decreases range from 13 percent in North Dakota to 35 percent in Nebraska, as shown in Chart 16. In North Dakota, South Dakota, Wisconsin, Nebraska, 2015 data were unavailable. South Dakota inventory increased by 44 percent and Wisconsin increased by 22 percent.

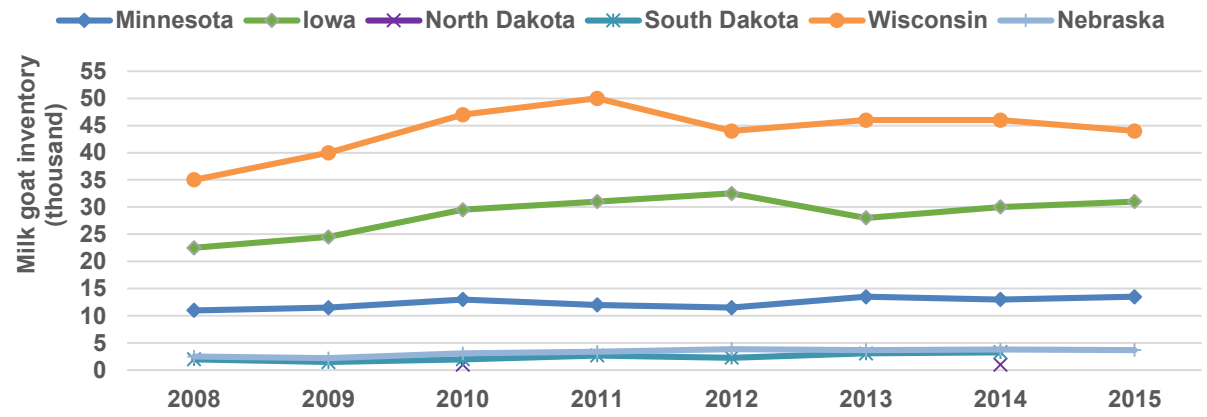
Chart 16. Meat goat inventory, 2008-2015



Source: USDA, NASS

Dairy goat numbers increased in all six states since 2008. Wisconsin and Iowa inventories increased by 26 percent and 38 percent, respectively. States with smaller inventories, such as South Dakota and Nebraska, increased by 65 percent and 48 percent, respectively (Chart 17). Minnesota's dairy goat inventory increased 23 percent. This is due in part to the demand for goat milk and goat cheese. Goat milk is a good alternative for some people that are lactose intolerant. A major roadblock for more exponential growth in the dairy goat sector is the marketing of milk with only a few facilities purchasing goat milk, mainly in Wisconsin. Minnesota has one major goat milk buyer, but shows growth, along with Iowa, because of proximity to Wisconsin.

Chart 17. Milk goat inventory, 2008-2015



Source: USDA, NASS

Angora goats (raised for the hair) are a very small percentage of the U.S. goat herd; they are raised in very small herds for a niche market that produces a luxury item and they are more difficult to raise and maintain. Producers often harvest the hair and then produce a finished product that is sold to a specific market. Minnesota and Wisconsin are the only states with angora inventory data. Both states have approximately 1,000 head according to NASS data.

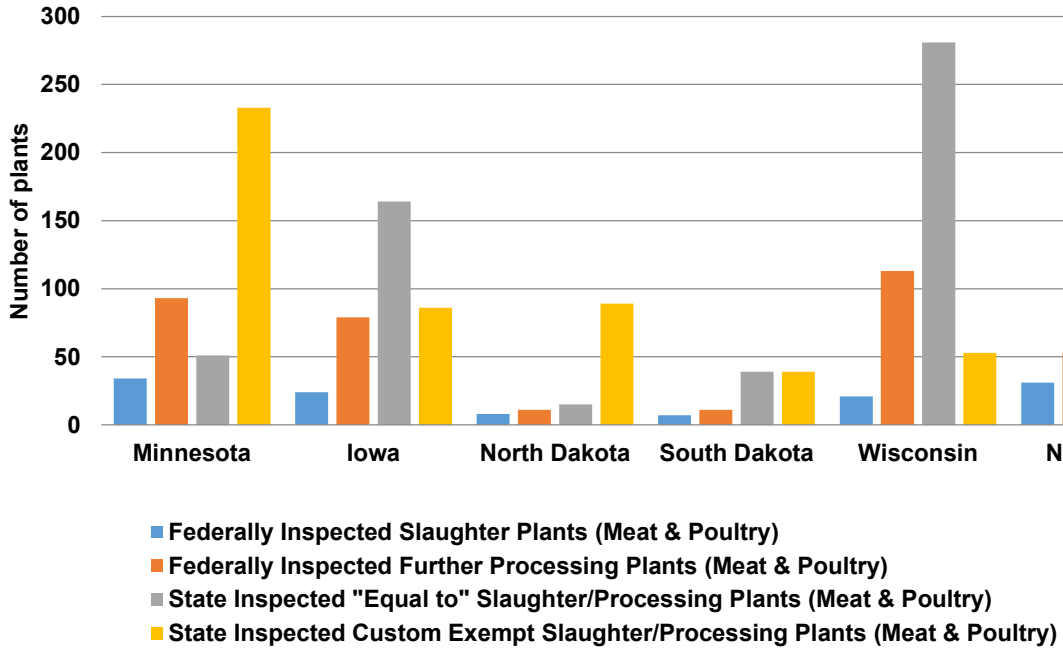
Livestock and Milk Processing

Livestock Processing

Chart 18 shows the number of slaughter facilities in the target states with Minnesota having the most custom exempt slaughter/processing plants while Iowa and Wisconsin have the greatest number of state inspected “equal to” facilities. Map 7 shows the distribution of the livestock slaughter and processing facilities. The custom exempt facilities were not included because the data were not available for all the states in the study.

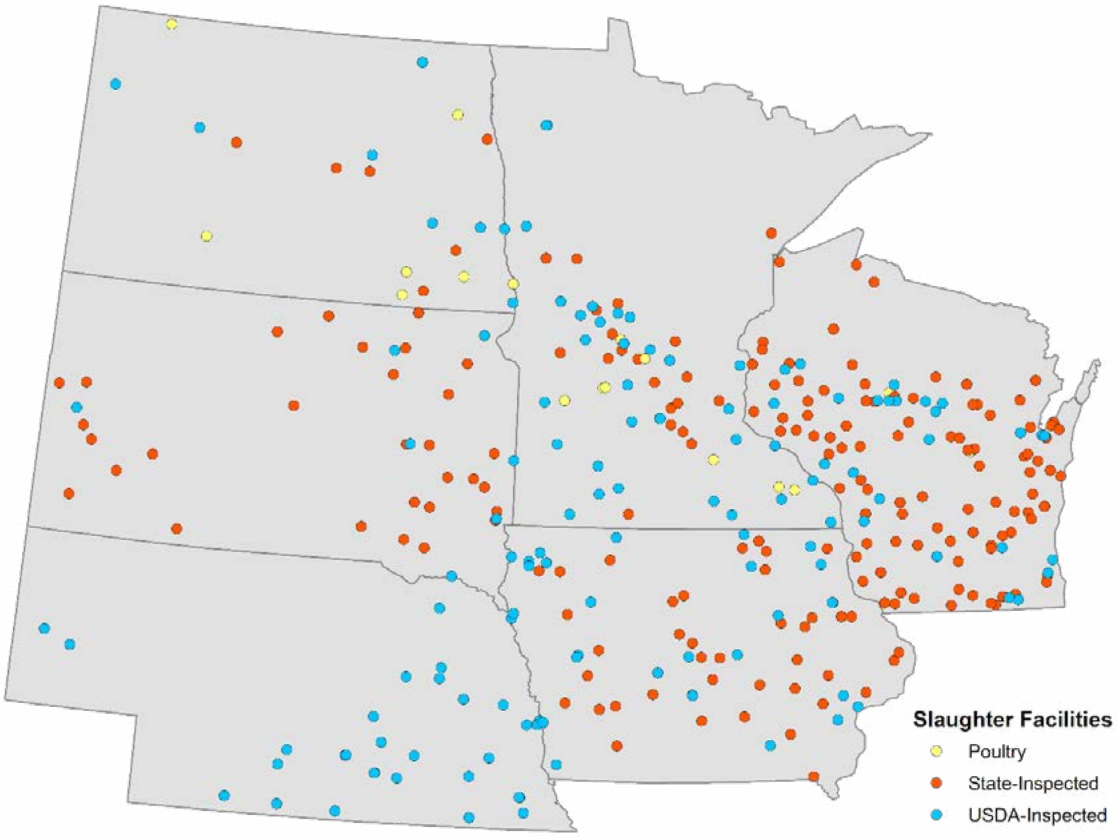
The ability of a state or region to expand livestock and milk production is largely dependent on the processing infrastructure. Comparisons of the number of livestock and milk processing facilities in the six-state region are shown below.

Chart 18. Slaughter and processing plants in selected states



Definitions: See Appendix A

Map 7. Federally inspected and Equal To facilities



Inspected processing facilities allow for interstate commerce and account for greater than 99 percent of the meat processing in the Upper Midwest. While custom exempt processors provide an alternative market for livestock producers and are a cornerstone of local communities, they only provide the option of local, direct marketing and the processed products are available for individual use only, not for interstate commerce.

Milk Processing

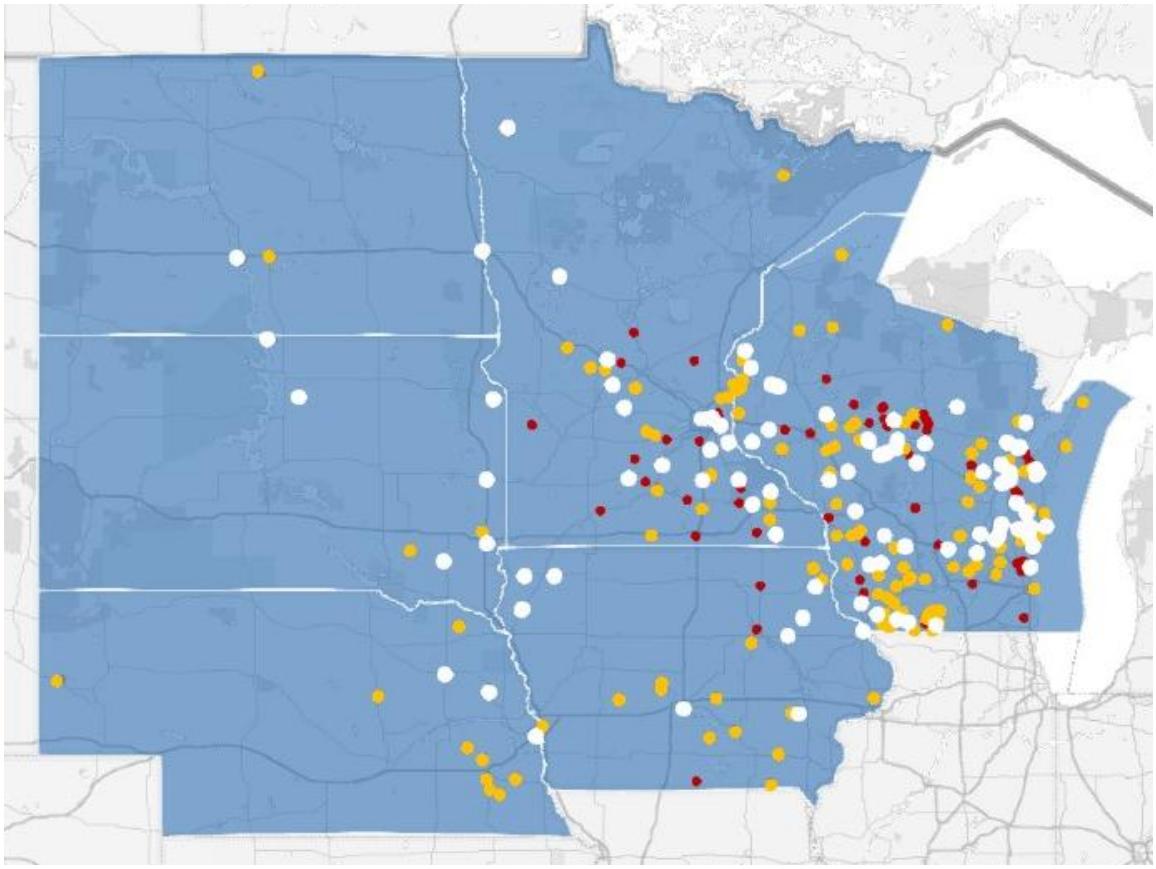
All dairy plants in Minnesota were classified into three categories:

1. Major dairy plants are those dairy plants that intake raw milk or cream.
2. Artisanal and farmstead operations are either very small independent dairy foods makers or dairy producers that have added dairy manufacturing capacity to their dairy operation. For the sake of completeness, in this category we include dairy plants that utilize sheep and goat milk.
3. Secondary processing plants are all plants that take dairy ingredients such as liquid or dry whey, cheese, milk powders, etc. as input in their production. These products are very diverse and range from butter-oil to cheese powders to animal nutrition products, etc.

Minnesota has 17 large dairy plants of which eight are cheese plants, six are fluid milk plants, one is a butter plant, one is a soft dairy products plant and two are milk powder plants.

Map 8 shows the locations of dairy plants in the six-state region.

Map 8. Dairy Plants in the Upper Midwest



MN Dairy Plant Types: ● Artisan/Farmstead ○ Major Dairy Plants ● Secondary Processors

A survey of milk processors in Minnesota was conducted by the University of Minnesota's Dr. Marin Bozic in 2015. The survey indicated that Minnesota's dairy sector is no longer facing a sluggish milk supply, but is experiencing bottlenecks in milk processing capacity. Map 8 charts all dairy plants in Minnesota and in the neighboring states. Investments to stimulate dairy processing capacity and boost demand for locally produced fluid milk and soft dairy products will be required to stimulate further growth.

As part of the Upper Midwest survey, Dr. Bozic contacted all major processors in Minnesota for additional information on plant-level data on capacity and capacity utilization. Processors were offered confidentiality agreements that guarantee only aggregate measures of capacity will be reported publicly. With only a few exceptions, most Minnesota dairy processors shared all requested sensitive production and capacity data. For processors where information was not available directly, interviews with dairy industry participants working with these plants obtained necessary data indirectly. As a result, comprehensive and precise aggregate measures on dairy capacity and utilization in the state show that from 2010 to 2015, Minnesota cheese plant capacity utilization went up from 93.1 percent to 96.2 percent even though annual aggregate milk intake capacity went up from 6.1 to 7.3 billion pounds (an 18.8 percent increase) over this period due to expansions. Over the same period, non-cheese plant utilization (fluid, soft and drying plants) decreased below 65 percent of capacity due to declining demand for fluid milk and increase in milk condensing capacity that is still not being utilized. As South Dakota and Wisconsin increased their own production, the percentage of Minnesota's milk production processed outside Minnesota borders declined from 16.2 percent in 2010 to 7.5 percent in 2015.

In addition there are reports of milk being dumped in Michigan because there was a lack of processing capacity to handle the milk in the late spring of 2015. Also as a result of the lack of processing capacity, there are restrictions on dairy growth in the Northeast U.S. These are examples of the impact on the dairy industry if processing capacity is not increased.

These statistics suggest the following:

- Neighboring states have grown their own milk production faster than processing capacity and they do not need to import as much milk from Minnesota as before.
- Due to declining demand, Minnesota fluid milk plants are being utilized less.
- Cheese plants have undergone substantial increases over the past five years through a combination of major plant upgrades as well as incremental expansions achieved through optimizing product mix or resolving production bottlenecks. At over 96% utilization, it is fair to say that cheese plants in Minnesota are essentially full. Some increase in milk intake may come from running longer production shifts, but that opportunity is fairly limited.
- Under-utilized capacity still exists in the production of butter and dried milk powder, as Plainview Milk Products Cooperative recently increased the capacity of their spray dryer.

The confluence of these four factors suggests that while capacity still exists to accommodate seasonal milk production surges, the recent decline in milk price basis is at least partially going to be persistent over the next several years. Stimulating investments in cheese processing capacity and boosting demand for fluid/soft dairy products from local processors would seem to be policy initiatives that can help to address the forthcoming oversupply of milk in Minnesota.

Permitting and Zoning

Livestock permitting and zoning regulations in the six-state region have similarities but also differences (Table 5). Fewer people are seeking full time employment in the livestock sector due to the lack of flexibility in schedules, risk in the market place, and high introductory and input costs. As a result, there are fewer producers and they are raising a larger number of animals per farm leading to added public scrutiny regarding environmental sustainability and added potential conflict with neighbors (residences, cities, towns, cemeteries, churches, etc.). While most of the requirements specific to permitting livestock facilities are on a level playing field on the federal level, population levels, public understanding of agriculture, natural resources, and economic impact shape the differences in permitting and zoning laws in each state.

One major difference in livestock regulation of large feedlots is that Minnesota requires an environmental review that is not required in other states. The purpose of NPDES and SDS permits (see Appendix A for definitions) is to keep animal waste out of water. Livestock operations with close proximity to any of Minnesota's 12,000 lakes and many stream miles, have more potential to impact water quality than compared to Iowa, which has far fewer lakes than Minnesota. Minnesota's economy of tourism and recreation is tied to water and is protected with these permits.

The environmental review process may increase initial permitting costs significantly and can be a deterrent to livestock expansion. Minnesota as a state does not get involved in zoning and gives that responsibility to local governments or other political subdivisions. Local zoning control is prominent in Minnesota, especially on the township level, which is not the case in neighboring states. Local zoning boards are authorized by statute to create their own requirements/ permits to protect the general health, safety, and welfare of its population. These requirements may be more restrictive than state requirements; however, they cannot be less restrictive than any provision in state statute or, in the example of township government, less restrictive than a county requirement.

Table 5. Requirements for state and federal operating permits, zoning, water appropriation and environmental review

	Minnesota	Iowa	North Dakota	South Dakota	Wisconsin	Nebraska
Federal NPDES Operating Permit	Yes: required if there is a discharge & CAFO	Same as Minnesota; however, Iowa does not have general NPDES permits, only individual	Yes: required combined State/Federal CAFO	Yes: required combined State/Federal CAFO	Yes, required combined State/Federal CAFO or 1,000+ AU	Same as Minnesota
State Operating Permit	Yes: State Disposal System (SDS) permit required if >1,000 AU. Or, can obtain coverage under NPDES permit.	State permit for construction of CAFO	Yes: see above	Yes: see above	Yes: required if there is a discharge & CAFO	Only if NDEQ requires it after review
Manure Management Plan	Yes: required for all State and Federal permitted sites	Yes: same as Minnesota	Yes: same as Minnesota	Yes: same as Minnesota	Yes: same as Minnesota	Yes: same as Minnesota
Winter Spreading 1. Liquid 2. Solid	1. No application after Nov 30th on frozen or snow-covered ground, except for emergency situations; must follow permit requirements. 2. Must follow MMP	1. No winter application from Dec. 21-April 1 if ground is frozen. 2. Must follow MMP	1 & 2: Allowed – must have and follow a nutrient management plan	1 & 2 Allowed – must have and follow a nutrient management plan	1. No application on frozen or snow covered ground, unless immediately incorporated or injected. 1. No application in Feb/Mar unless immediately incorporated	1 & 2: Allowed – must have and follow a nutrient
Run-off controls, basins, feed pad regulations	Facility must be designed and operated to meet zero discharge	Facility must be designed and operated to meet zero discharge	Facility must be designed and operated to meet zero discharge	Facility must be designed and operated to meet zero discharge	Facility must be designed and operated to meet zero discharge	Facility must be designed and operated to meet zero discharge

	Minnesota	Iowa	North Dakota	South Dakota	Wisconsin	Nebraska
Local Zoning County	Yes: no restrictions other than county ordinances; cannot be less restrictive than any state law	Chapter 355 prohibits counties from zoning farms, including feedlots	Chapter 11-33-02 and 58-03-11 prohibits counties from not allowing expansions & construction of feedlots & caps setbacks at 1.5 miles	Same as Minnesota	Yes, state law requires all feedlots over 500 AU be approved if they meet state standards	Counties may institute distance
Local Zoning Township	Yes: no restrictions other than township ordinances; cannot be less restrictive than any state or county law	State statute does not allow township zoning	Same as above, except setback cap is .5 mile	Yes	Only if county located in does NOT zone	Yes
Water Appropriation Permit	Yes, if usage is over 10,000 gallons/day or one million gallons/year	Yes, if usage is over 25,000 gallons/day	Yes, if usage is over 4.0731 million gallons/year	Yes, if usage is over 25,920 gallons/day	Registration, not permit, is required for usage over 100,000 gallons/day. Permit required for same if located in Great Lakes Basin.	All wells need permits from local Natural Resources District. No minimum usage requirement
Environmental Review	Yes, required for new or expanding over 1,000 AU or 500 AU in sensitive areas	No	No	No	Yes, required only if WDNR permit drafter determines its necessity	No

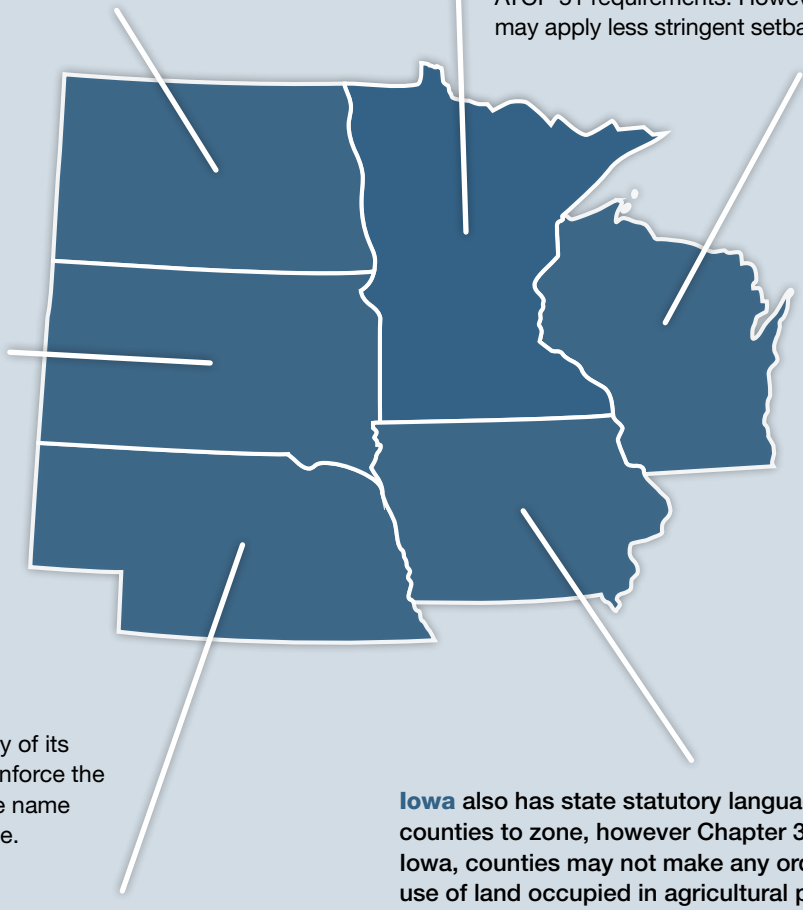
Source: Minnesota Pollution Control Agency, Minnesota Department of Agriculture. See Appendix A for definitions.

Included for each state, below, is the statutory language regarding feedlot permitting and authorizations for local governments to zone.

North Dakota, despite broad powers granted to counties with respect to zoning through the constitution of North Dakota and Chapter 11-33-02 and 58-03-11 of the North Dakota Century Code, many specific exceptions exist. For example, counties and townships may not prevent the use of land for agricultural or ranching purposes, nor may they prohibit the expansion of diversification of agricultural or ranching buildings and operations, though they may establish low-density production zones around residential, commercial, and industrial areas (but cannot exceed 1.5 miles in counties and .5 miles for townships). A board of county or township commissioners also may not preclude the development of a concentrated feeding operation in the county or township. Any new regulation that is approved within a county or township and creates a substantial economic burden to an existing CAFO, the county/township shall excuse the CAFO from meeting the new requirement.

In **South Dakota**, the South Dakota Constitution and Title Six and Seven of the South Dakota Statutes authorizes counties, in the interest of conservation, to make ordinances to protect public water from pollution if they so desire. Chapter 8-2-1-4 of codified law in South Dakota gives townships the option to pass bylaws or ordinances for the government of such township and for the protection of the lives and property of its inhabitants, and to enforce the same in its corporate name before any magistrate.

In **Nebraska**, counties are given statutory authority to regulate conservation and agriculture and counties may institute distance requirements from the nearest residence; however, counties may not implement a moratorium on livestock waste facilities nor impact existing facilities.



Minnesota statutes Chapter 394.21 and Chapter 462 give the authority to counties and townships to develop their own zoning ordinances. However any county ordinance cannot be less restrictive than any rule in state statute and any township ordinance cannot be less restrictive than any rule in state statute or the county ordinance in which they reside.

Wisconsin has a state livestock siting law, Chapter ATCP 51, that establishes a framework for issuing local permits for new or expanding livestock facilities that have more than 500 animal units and that are required to obtain local approval. If a city, village, town or county chooses to require a permit to site facilities, then that political subdivision must use the statewide standards contained in chapter to evaluate permit applications. Further, local political subdivisions must approve applications that meet the Chapter ATCP 51 requirements. However, local governments may apply less stringent setback requirements than found in chapter ATCP 51, and may apply more stringent siting standards if the increased standard is based on "reasonable and scientifically defensible findings of fact" that show that the standard is necessary to protect public health or safety. Appeals to local decisions are made the states Livestock Facility Siting Review Board. Wisconsin statute 60.61 gives authority to townships to zone if the county they are located within does not enforce county wide zoning.

Iowa also has state statutory language authorizing counties to zone, however Chapter 335 exempts farms. In Iowa, counties may not make any ordinance regulating the use of land occupied in agricultural production, including animal feeding or care operations, except specifically permissible by state law. The local board may receive copies of CAFO permit applications or receive permits on behalf of the State of Iowa. Any local zoning requirement regarding feedlots and permissible by state law cannot be less stringent than state requirements. Townships are not given statutory authority to create zoning ordinances.

Permitting Costs Associated with Livestock Facilities

The general costs of permitting on the state level are shown in Table 6. It does not include permitting costs on local levels. The chart also shows time-line rules or goals for the permitting process and approval in selected states. Minnesota currently has some of the highest costs for permitting of all six states.

Table 6. Permitting costs

	Minnesota	Iowa	North Dakota	South Dakota	Wisconsin	Nebraska
General NPDES or SDS Application Fee	$620	$0	No	No	No	$200
Individual NPDES or SDS Application Fee (new site)	$1,860	$85	No	No	No	$200
Individual NPDES or SDS Application Fee (reissuance)	$620					
General NPDES or SDS Annual Fee	$345	$0	No	$175	$345	$50
Individual NPDES or SDS Annual Fee	$1,230	$340	No	$175	$345	$50
Initial Inspection Fee	No	No	No	No	No	$500
Indemnity Fee (one-time fee in case of disaster clean up)	No	$150	No	No	No	No
Manure Management Plan Filing Fee	No	$250	No	No	No	No
Construction Permit Fee	No	$250	No	No	No	No
Storm water permit fee	$0	$175	$0	$0	$140	$0
Total Cost for new NPDES or SDS General Permit	$620	NA	$0	$175	$485	$700
Total Annual Fee Cost to operate under General NPDES or SDS	$345	NA	$0	$175	$345	$50
Total Cost to apply for new Individual NPDES or SDS permit	$1,860	$910	$0	$175	$485	$700
Total cost for annual fee to operate under Individual NPDES or SDS permit	$1,230	$590	$0	$175	$345	$50
Deadline for state to make permitting decision that affects applicant	60 day rule	60 day rule on NPDES*	180 day goal*	60 day goal*	150 day rule*	No
Deadline for local government to make permitting decision that affects applicant	60 day rule	No	No	65 day rule	No	No

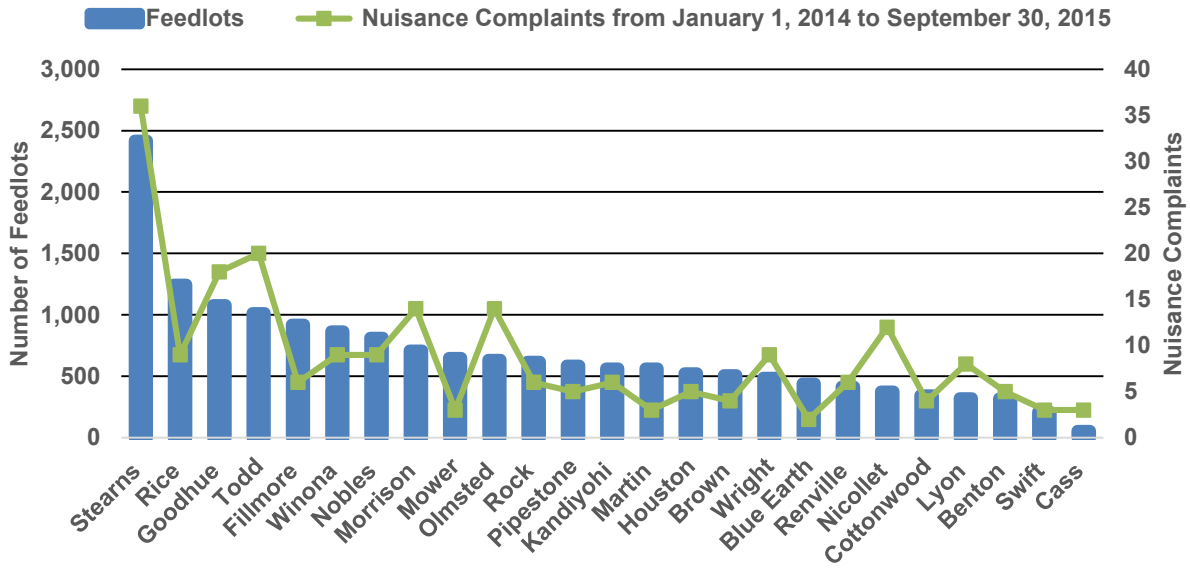
* Additional details related to permitting decisions are referenced in Appendix B.

Nuisance Conflicts and Complaints

Land use conflicts, including nuisance complaints and lawsuits, both during the livestock siting process and after the start of operation, are unusual in Minnesota. For those neighbors or livestock operations involved, these lawsuits can be personal and costly.

Chart 19 shows the number of complaints received by county feedlot officers in delegated Minnesota counties and through Sheriff's Departments in non-delegated counties from January 1, 2014 to September 30, 2015. Citizen complaints focus on many issues regarding livestock and include, but are not limited to, manure runoff, loose animals, and odor complaints. Counties with the greatest number of feedlots also had the greatest number of nuisance complaints.

Chart 19. Nuisance complaints, Jan. 1, 2014 - Sept. 30, 2015



Nuisance, in general, is a condition, activity, or situation that interferes with the use or enjoyment of property. There are two types of nuisance, public and private. A public nuisance occurs when there is an unreasonable interference with a right common to the general public, such as a condition dangerous to health, offensive to community moral standards, or unlawfully obstructing the public in the free use of public property. In contrast, a private nuisance is an interference with an individual's enjoyment of property which constitutes a tort or civil wrong. A nuisance is distinguishable from trespass, however, as trespass requires an unauthorized physical entry onto another's property.

The MDA searched for nuisance lawsuits both statewide and federally to assess the number of livestock-related cases that have occurred in the past ten years. In Minnesota there have been three nuisance lawsuits that were related to agricultural operations. Each case has been settled – one involved sprayer drift onto organic crops, one involved bees, and the final case involved livestock. Nationwide there were only four legal cases that involved agriculture in relation to nuisance; only two were livestock related. Kentucky (2013) and Indiana (2012) each had cases related to swine odors. The other cases were related to dust, erosion and exotic animals.

In the early days of Minnesota statehood, land was abundant and neighbors were distant. Today, with the trend to larger-scale business models (both agricultural and non-agricultural) and rising population in some rural areas, conflicts are becoming more frequent. In addition, the recent threats of various strains of foreign animal virus (porcine epidemic diarrhea virus and high path avian influenza, for example) have caused livestock producers to consider locating future livestock operations in less-concentrated regions of the state for bio-security purposes. As farmers move operations into areas where residents are not familiar with today's farming practices (e.g., larger livestock operations), protecting the rights of farming operations in agriculturally zoned areas and the adjacent property owners will become more complicated.

If a homeowner purchases a property in an urban area that is zoned for both residential and commercial use or has neighboring manufacturing businesses in close proximity to the residence, certain noise levels or traffic congestion may be considered a nuisance at times but not unexpected. The same reasoning could be made for a rural homeowner who purchases next to an existing livestock operation or in a township zoned for agricultural purposes. Certain expectations of what constitutes an interference of property rights should be weighed by local zoning laws and land-use ordinances to limit public nuisances and maintain the quality of the neighborhood and community.

Right-to-Farm laws in the United States deny nuisance lawsuits against farmers who use accepted and standard farming practices. All 50 states have some form of Right-to-Farm law. Minnesota Statute 561.19 says that an agricultural operation cannot be considered a nuisance if it has been in operation for at least two years and operates according to "generally accepted agricultural practices." However, under Minnesota law, animal operations are exempt from the Right-to-Farm law on if the operation has a swine capacity of 1,000 or more animal units or cattle capacity of 2,500 head or more.

Table 7 is a breakdown of the current Right-to-Farm statutes for the six states included within the Livestock Study.

Table 7. Nuisance and Right-to-Farm legislation

State (Statute)	Law application/key definitions	Not a nuisance if…including time in operation requirement	Attorney Fees/ Court Costs	Relief Granted to Plaintiff	Limitations/Other information
Minnesota (Minn. Stat. §561.19)	Agricultural operations: Defined as facility and its appurtenances for the production of crops, livestock, poultry, dairy or poultry products, but not a facility primarily engaged in processing	-located in agriculturally zoned area -complies with all applicable federal, state, or county laws, regulations, rules, and ordinances and any permits issued for the agricultural operation -operates according to generally accepted agricultural practices -2 years from established date of operation			Does not apply: -animal feedlot facility with a swine capacity of 1,000 or more animal units as defined by the PCA or cattle capacity of 2,500 animals or more -to any prosecution for a crime of public nuisance or to an action by a public authority to abate a particular condition which is a public nuisance -to an enforcement action related to zoning brought by a local unit of government
Wisconsin (Wis. Stat. $823.08)	-Agricultural use: Any of the following activities conducted for the purpose of producing an income or livelihood: crop or forage production, keeping livestock, beekeeping, nursery sod, or Christmas tree production, floriculture, aquaculture, fur farming, forest management, enrolling land in a federal agricultural commodity payment program or a federal or state agricultural land conservation payment program. And any other use that the department, by rule, identifies as an agricultural use -Agricultural practice: any activity associated with agricultural use	The agricultural use or practice is: -conducted on, or on a public right-of-way adjacent to land that is agricultural use without substantial interruption before the plaintiff began use of property that is alleged to be interfered with -Does not present a substantial threat to public health or safety	-Litigation expenses to defendant if found not to be a nuisance	-May not substantially restrict or regulate the use or practice, unless a substantial threat to public health or safety -if required to take action, court will request expertise on how to mitigate from public agencies, and give the operation up to a year to implement -court may not require any action that substantially interferes with the economic viability of the use unless substantial threat to public health or safety exists	

State (Statute)	Law application/key definitions	Not a nuisance if…including time in operation requirement	Attorney Fees/ Court Costs	Relief Granted to Plaintiff	Limitations/Other information
South Dakota (SD Codified Laws §§ 21-10-25.1 to 21-10-25.6)	Agricultural operation and its appurtenances: any facility used in the production or processing for commercial purposes of crops, timber, livestock, swine, poultry, livestock products, swine products, or poultry products	-Facility was not a nuisance at the time the operation began -One year in operation	-If action is found to be frivolous by the court, defendant recovers the aggregate amount of costs reasonably incurred in connection with the defense and attorney's fees		-Doesn't apply if a nuisance is the result of negligent or improper operations -Doesn't affect the right of any person, firm or corporation to recover damages for injuries sustained as a result of the pollution or other change in the quantity or quality of water used by that party for private or commercial purposes or as a result of any overflow of land by or in the possession of any such person, firm, or corporation
North Dakota (N.D. Cent. Code §§ 42-04-01 to 42-04-05)	Agricultural operation: science and art of producing plants and animals useful to people. Includes livestock auction markets and horticulture, floriculture, viticulture, forestry, dairy, livestock, poultry, bee, and any and all forms of farm products, and farm protection	-If operation was not a nuisance at the time it began -One year in operation			-Doesn't stop a person from recovering damages for any injury or damage sustained by the person on account of any pollution of or change in the condition of the waters of any stream or on account of any overflow of lands of any such person -Doesn't apply if nuisance results from negligent or improper operation -Passed North Dakota Farming and Ranching Amendment (Article XI, Section 29) in 2012 which blocks any law "which abridges the right of farmers and ranchers to employ agricultural technology, modern livestock production and ranching practices."
Iowa (Iowa Code §352.1 to 352.12)	-Farm: The land, buildings, and machinery used in commercial production of farm products -Farm Operation: Condition or activity occurring on a farm in connection with the production of farm production, not limited to the raising, harvesting, drying, or storage of crops; the care or feeding of livestock; the treatment or disposal of wastes resulting from livestock; the marketing of products at roadside stands or farm markets; the creation of noise, odor, dust, or fumes; the operation of machinery and irrigation pumps; ground and aerial seeding and spraying; the application of chemical fertilizers, conditioners, insecticides, pesticides, and herbicides; and the employment and use of labor	No time requirement	Court costs and reasonable attorney fees if claim is found to be frivolous		-Requires mediation prior to bringing an action in court -Doesn't apply if action arises from injury or damage to person/property -Does not apply if nuisance is result from an operation in violation of a federal statute, regulation, state statute, or rule. -Can recover damages for injury or damages caused by pollution or change in condition of the waters of a stream, the overflowing of a person's land, or excessive soil erosion onto another person's land, unless it is the result of an act of God

State (Statute)	Law application/key definitions	Not a nuisance if…including time in operation requirement	Attorney Fees/ Court Costs	Relief Granted to Plaintiff	Limitations/Other information
Nebraska (Neb. Rev. Stat. §§ 2-4401 to 2-4404)	-Farm or farm operation: Any tract of land over ten acres in area used for or devoted to the commercial production of farm products -Public grain warehouse or public grain warehouse operation: any grain elevator building or receptacle in which grain is held for longer than ten days and includes, but is not limited to, all buildings, elevators, and warehouses consisting of one or more warehouse sections within the confines of a city, township, county, or state that are considered a single delivery point with the capability to receive, load out, weigh, and store grain	If operation or warehouse existed before a change in the land use or occupancy of land in and about the locality of the operation and before such change, the operation would not have been a nuisance			

Overview/Key Points of Right-to-Farm Legislation in Target States

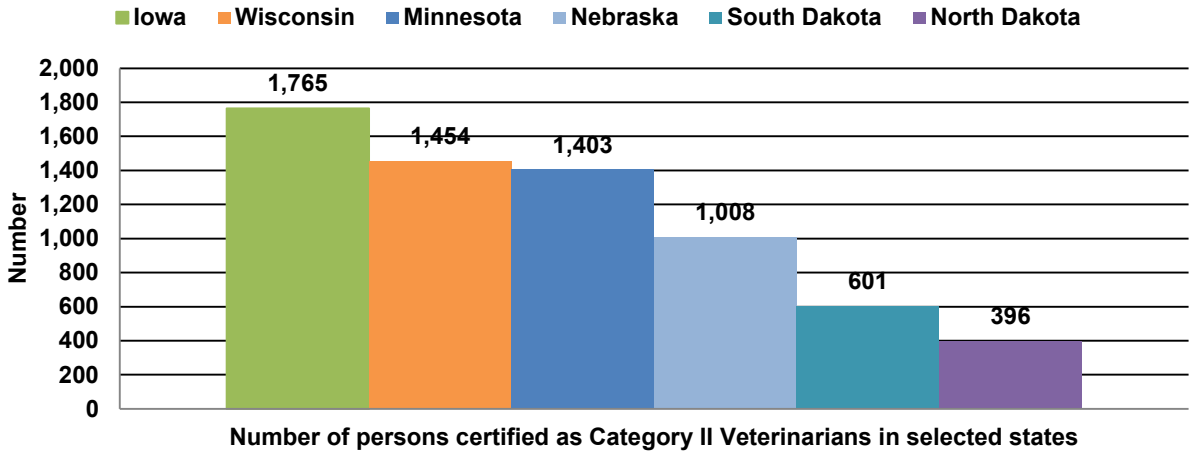
- Minnesota is the only state to address animal feedlots of a certain size.
- North Dakota is the first state to go beyond the Right-to-Farm law in protecting farmers and ranchers with the passing of the Farming and Ranching Amendment in 2012.
- Wisconsin's requirement that an agricultural practice be a substantial threat to public health or safety in a nuisance action appears to eliminate a cause of action for private nuisance.
- Minnesota, North Dakota, South Dakota, and Iowa address a time in operation requirement, while Wisconsin and Nebraska do not.

Other Factors Impacting Livestock Levels

Veterinary Services

A successful livestock industry is dependent on the availability of veterinarian services as herd health and tightened bio-security management procedures become the norm rather than the exception. Chart 20 shows the number of certified Category II veterinarians in the six states in 2015. Iowa has the largest number of veterinarians, 1,765, with Minnesota and Wisconsin nearly equal with more than 1,400. Nebraska has approximately 1,000, followed by South Dakota at 600 and North Dakota under 400.

Chart 20. Number of persons certified as Category II veterinarians, 2015



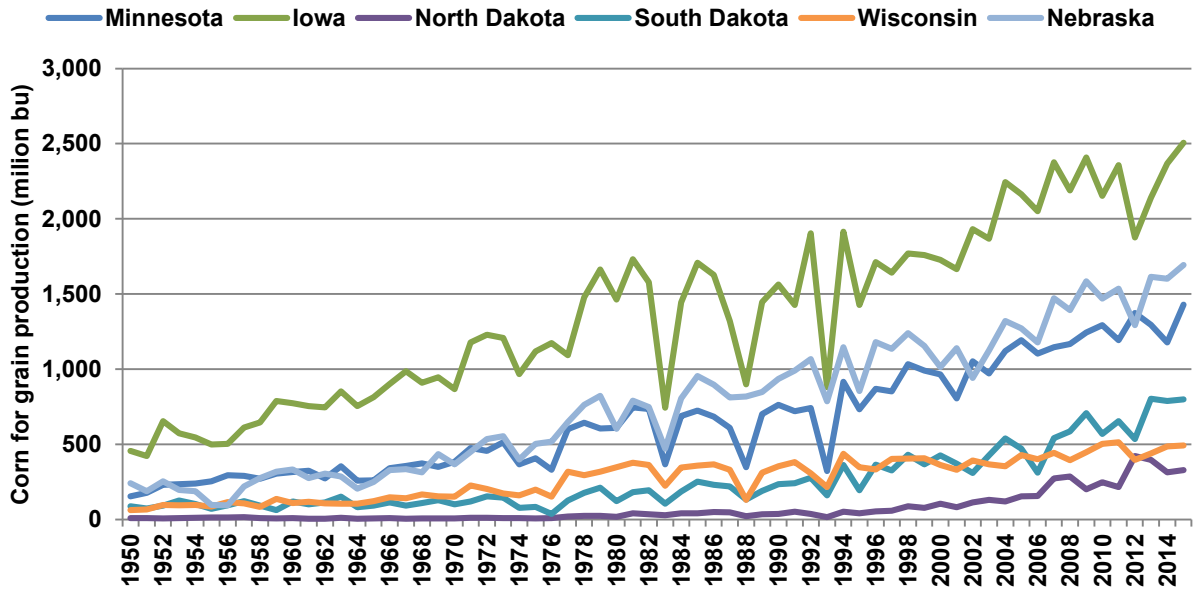
Source: USDA APHIS Veterinary Services/MN Board of Animal Health/North Dakota Board of Animal Health

Crop Production

A major change in farming trends over the past 20-30 years is the increase in corn and soybean acreage and total production. Improved plant genetics, new technology, and crop consultants have led to a major shift from small grains to row crops. These row crops are major components of the livestock feed industry. The availability of feedstuffs contributes to the homegrown livestock feeding industry and provides an important market to the state's row crop farmers.

Chart 21 (on the following page) shows the corn production increase for the six study states since 1950. This growth continued over the past 10 years, where record-level harvests continue to occur. In Minnesota, corn production in 2015 was 4 percent higher than the previous state record set in 2012. North Dakota's production experienced the most rapid growth, from 9.35 million bushels (bu.) in 1950 to 328 million bu. in 2015.

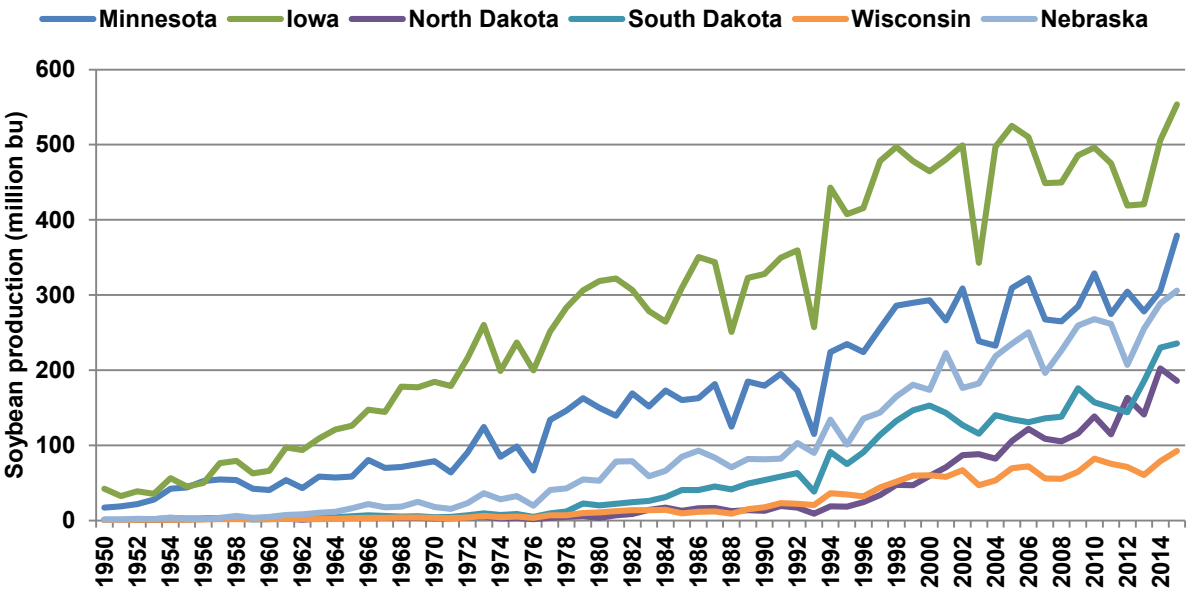
Chart 21. Corn for grain production (bu.), 1950-2015



Source: USDA, NASS

Chart 22 shows the soybean production increase for the six study states since 1950. In 2015, Minnesota soybean yield was the highest on record, 5.0 bu. higher than the previous record set in 2010. As with corn, North Dakota's production increased the most from 430,000 bu. in 1950 to 190 million bu. in 2015.

Chart 22. Soybean production (bu.), 1950-2014

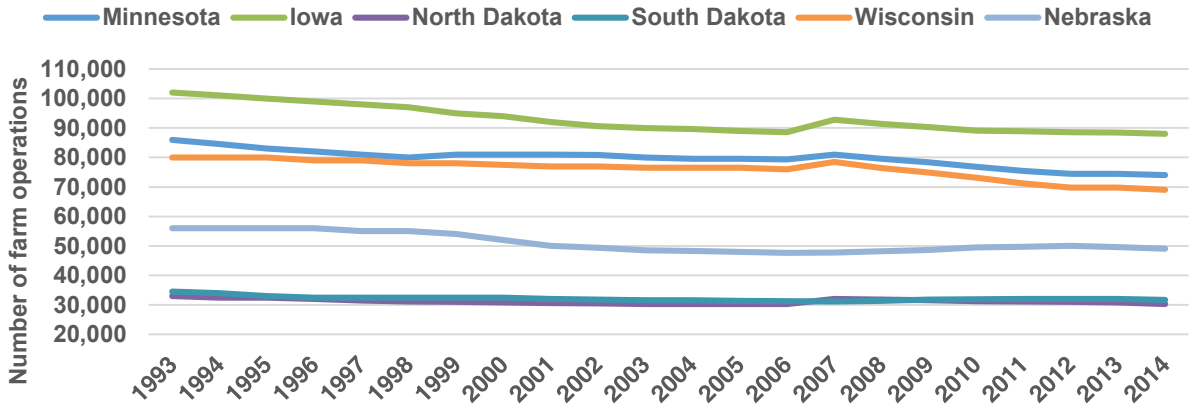


Source: USDA, NASS

Farm Numbers

The number of farms[6] nationwide has been on a declining trend since World War II. Data collected since 1993 shows that the six study states are no exception. From 1993 to 2014, Iowa, Minnesota, and Wisconsin experienced a 14 percent decrease in the number of farms. Nebraska's farms decreased by 12 percent and North Dakota and South Dakota decreased by 8 percent. Chart 23 shows this long-term trend. In the Midwest and across the U.S., livestock production has shifted to larger and more specialized farms that focus in various stages of input provision, farm production and processing. New technologies – mechanical, biological, and chemical – create important financial advantages to larger, more specialized operations.[7]

Chart 23. Farm numbers, 1993-2014

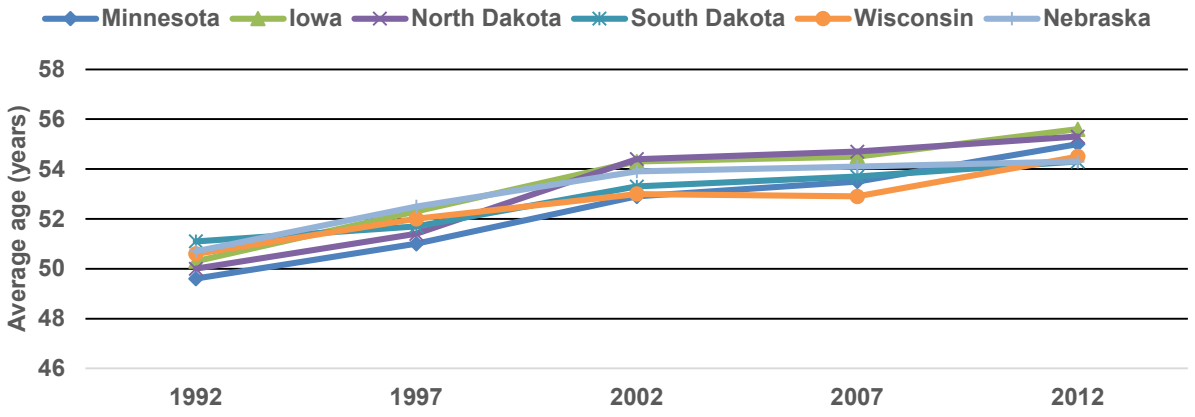


Source: USDA, NASS

Average Age of Principal Operators

The average age of principal farm operators in all six study states is steadily rising (Chart 24). In Minnesota, the average age increased from 49.6 years in 1992 to 55.0 in 2012. As producers age and retire, new farm owners and workers will need to take their place. Labor is a key component in livestock operations, and with rural population declining nationwide, it will likely be difficult to find help and new owners.

Chart 24. Average age of principal operators, 1992-2012



Source: USDA Agricultural Census

[6] A farm is defined as any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the year.

[7] MacDonald, James M. and McBride, William D. The Transformation of U.S. Livestock Agriculture: Scale, Efficiency, and Risks, Economic Information Bulletin No. 43. Economic Research Service, U.S. Dept. of Agriculture. January 2009.

State Assistance Programs

Minnesota has a number of state financial and technical assistance programs through the MDA. Livestock Investment Grants (part of the Agricultural Growth, Research and Innovation Program (AGRI)) cover up to 10 percent of the cost of equipment and facilities that are livestock related. Two million dollars is budgeted each year and awarded competitively to livestock farmers across the state. Value Added Grants (also part of the AGRI Program) cover up to 25 percent of equipment that adds value to Minnesota agricultural products. This program also has a budget of $2M/year. This grant has funded several artisan cheese manufacturers and several meat processors in the past two years. MDA's Dairy Profit Teams work one-on-one with 280 dairy farmers to help them become more profitable and sustainable. Dairy Business Planning Grants provide a 50 percent cost share to dairy farmers to complete a business plan for expansion, modernization or value added processing. These $3,000 grants are available on a first-come, first-served basis and typically will fund 20-25 farms per year. The Minnesota Farmer Assistance Network (MFAN) provides a database of resources for farmers who are experiencing financial and mental challenges. The Rural Finance Authority provides financing to lenders up to 45 percent of the loan amount at reduced interest rates and is funded through state bonding. These loans can be used for the purchase and construction of livestock buildings and are also available to beginning farmers. MDA livestock specialists on who work one-on-one with farmers to help them navigate the livestock permitting process.

Wisconsin has several state-sponsored incentive programs to assist livestock farmers. The most popular are small grants ($5,000) to dairy farmers to complete planning for expansion or modernization. These planning grants are part of a longer-term action plan to achieve 30 billion lbs. of milk by 2020. Production is currently at 27.7 billion lbs. and these planning grants are granted to approximately 40 farms statewide/year. Wisconsin also had tax incentive programs directed at livestock farmers to expand and modernize, but those program recently sunsetted. There are still some tax incentives for milk processors to modernize their facilities. Several state and private individuals are available to assist livestock farmers through the permitting process. Wisconsin also has a Farm Center housed at the Department of Agriculture, Trade and Consumer Protection with experts who help with financial planning options as well as some transition planning.

Iowa doesn't have any financial incentive programs but does employ staff who help livestock farmers through the permitting process and nutrient management plans as well as some engineering assistance. The commodity groups in Iowa have also hired four regional employees to assist farmers through the permitting process.

Nebraska has some incentive programs directed toward livestock modernization but they are extremely competitive and are funded at only $500,000/year. There are some financial incentives for processors to modernize through a competitive grant process but this too has limited funding. The permitting process is administered by the Department of Environmental Quality which has staff to assist livestock farmers through the permitting process as well as several private consultants who work with farmers during the process.

While South Dakota does not have any financial incentive programs, the South Dakota Department of Agriculture is making a concerted effort to grow the dairy industry. The Department has four regional staff who promote South Dakota as a place to relocate and expand livestock. South Dakota has also pre-identified sites for new livestock development that would meet current feedlot requirements. These sites utilize available infrastructure and setbacks as well as other considerations for site location. Permitting assistance is available at the Department of Agriculture as well as through private individuals. South Dakota has some additional bond and loan programs directed at beginning farmers.

North Dakota does not currently have any financial incentive programs, but, like South Dakota, has staff at the North Dakota Department of Agriculture dedicated to the promotion of livestock development as well as permitting assistance. North Dakota also has Dairy Profit Teams. The state does have a state-owned bank that provides financing to agriculture as well as to commerce. North Dakota has a state-funded Agricultural Production Utilization Grant Program that funds projects to develop new and expanded uses of North Dakota agricultural products and has a budget of approximately $1.5M/year. This grant is not specific to livestock but funds everything from agritourism to research and development/marketing.

Recommendations

The agricultural economy in Minnesota tends to be fairly stable because of the balance between the livestock and crop industries. When prices are low in one sector, they tend to be higher in the other. Supporting the state's livestock industry means rural communities will have year-round business activity and a vibrant local economy.

Minnesota should continue its regulatory efforts to protect the environment and natural resources. Crop and livestock producers should be encouraged to continue to follow recommended guidelines and standards and Best Management Practices (BMPs) that provide optimum health and growth of their livestock and crops. The environmental review process should seek a balance that includes public input and involvement. Projects that meet these standards should be encouraged to proceed. The following recommendations are presented:

- Ensure the success of Minnesota's livestock industry by encouraging processors to modernize and/or expand their operations to meet the growing market needs of the industry.
- Support the dairy processing infrastructure by stimulating investments in cheese processing capacity and boosting demand for fluid/soft dairy products. This would help to address the impending oversupply of milk in Minnesota.
- Fund programs that provide capital, low-interest loans and grants to young and beginning farmers or those considering an intergenerational transition of their farm.
- Fund educational programs that train and teach tomorrow's agricultural professionals, in particular large animal veterinarians who provide critical services to livestock farmers.
- Explore how state and federal agencies could allow the use of more conservation acres as "working lands" and combine protection for wildlife and habitat with a source of feedstuffs for livestock using proper grazing management practices.
- Support local ordinances that are fair, reasonable, recognize landowner property rights, and that seek solutions which allow for both livestock production and protection of the environment.
- Continue to fund Minnesota Department of Agriculture programs that provide beneficial financial and technical resources to both producers and processers.
- Increase the permitting process assistance provided to livestock producers, a service that has been successful in the other five states.

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Appendix A. Definitions

AU – Animal Units (one AU is equivalent to the amount of manure generated by one 1,000-pound animal). Minnesota uses AU, however the federal government uses animal numbers.

CAFO – Concentrated Animal Feeding Operation

CAFO's are point sources as defined by the federal Clean Water Act [Section 502(14)]. To be considered a CAFO, a facility must first be defined as an AFO-Animal Feeding Operation:

- Animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period
- Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

General/Individual NPDES permits:

- General Permit: Can cover permitting for facilities using standard practices and is an umbrella-type permit.
- Individual Permit: A permit written specific to a facility due to specific circumstances or due to use of technology not considered standard.

Large CAFO (a large CAFO is required to have an NPDES permit): A large CAFO confined at least the number of animals as listed below:

- 700 mature dairy cows
- 1,000 beef steers
- 1,000 heifers or background feeders
- 2,500 finishing swine
- 10,000 swine under 55 pounds
- 125,000 broiler chickens
- 55,000 turkeys
- 10,000 sheep/goats

Custom Exempt – Facilities that must follow all the same rules as other plants, but are inspected by the state less frequently than Equal To or federally inspected facilities. Food processed in these plants cannot be sold to the general zoning public, but animals are processed by facility for owner.

Equal To – An agreement between the USDA Food Safety Inspection Service and the individual states that allows states to perform the inspections of slaughter/processing plants with the same regulatory oversight as if the USDA were inspecting. However, food processed from these facilities can only be sold intrastate.

Federally Inspected – Facilities inspected by the USDA Food Safety Inspection Service. All products may be sold interstate.

Further Processing – Facility does not slaughter, only further processes meat cuts into different products.

MMP – Manure Management Plan

NMP – Nutrient Management Plan

NPDES – National Pollutant Discharge Elimination System permits regulate wastewater discharges to lakes, streams, wetlands and other surface waters.

SDS - State Disposal System permits regulate the construction and operation of wastewater disposal systems, including land treatment systems. Together, NPDES/SDS permits establish specific limits and requirements to protect Minnesota's surface and ground water quality for a variety of uses, including drinking water, fishing and recreation.

Appendix B. Feedlot permitting notes

Iowa Note: Iowa Code Chapter 459 and 567 Iowa Administrative Code Chapter 65. Iowa has no General NPDES permit, only Individual permits are required. Storm water permits are on a tiered fee schedule depending on how long construction will take, with one year permit at $175 and a 5 year permit at $700. Filing fee is required for manure management plans initially and when amended. A one-time indemnity fee is also required that goes into an account for feedlots that have a spill to assist with clean up. Iowa requires that total confinement feedlots are permitted within 60 days or permit is automatically granted. There is no timeline for feedlots that are open lots, however they try to keep it at 60 days as well (Paul Petitti, P.E, Environmental Engineer Senior, Iowa DNR).

North Dakota Note: 33-16-01-02 states an applicant of a NPDES permit must file a completed national pollutant discharge elimination system application no less than one hundred eighty days prior to the day on which it is desired to commence operation of the waste disposal operation.

South Dakota Note: No fee for initial application of general or individual NPDES permit. Annual fee applies to both general and individual NPDES permit holders and his a three tiered system as outlined in http://denr.sd.gov/des/fp/forms/CAFOchecklist.pdf and codified law 34A-2-125. Maximum fee for largest CAFO is $250. DENR has goals of issuing general NPDES permits that need public notice at 60 days and ones that do not at 30 days. The goal for individual NPDES permits is 180 days. Statute also gives a deadline for a local government to act on Conditional Use Permits of 65 days (Kent R. Woodmansey, P.E. Engineering Manager, SDDENR)

Wisconsin Note: No fee for initial application of general or individual NPDES permit. Annual fee applies to both general and individual NPDES permit holders, Statute 283.31(8). Three tiered system for storm water permit fees depending on number of acres disturbed.

NR 200.10 Time periods for action on permit applications and modification requests.

(1) Within 100 business days of receipt of a complete permit application or request for modification of an existing permit the department shall publish a class 1 notice under Chapter 985, Stats., indicating its intended action.

(2) Where a complete reissuance application has been received at least 180 calendar days prior to the permit expiration date, the department shall, at least 25 business days prior to the expiration date, publish a class 1 notice under Chapter 985, Stats., indicating its intended action. Where a complete reissuance application is not received at least 180 calendar days prior to the permit expiration date, the time deadline in sub. (1) shall apply.

(3) The department's final decision on a permit application or request for modification shall be made within 50 business days after completion of the hearing process under s. 283.49, Stats., and consideration of the environmental impact of the project as required by s. 1.11, Stats.

Nebraska Note: Annual fees are determined by a dollar amount specific to each species multiplied by each animal. Initial inspection fee is a one-time fee that is a tiered approach with monetary amounts categorized into small, medium and large AFO's. Application fees are a set amount for all sizes. All this is outlined Nebraska title 119 & 130