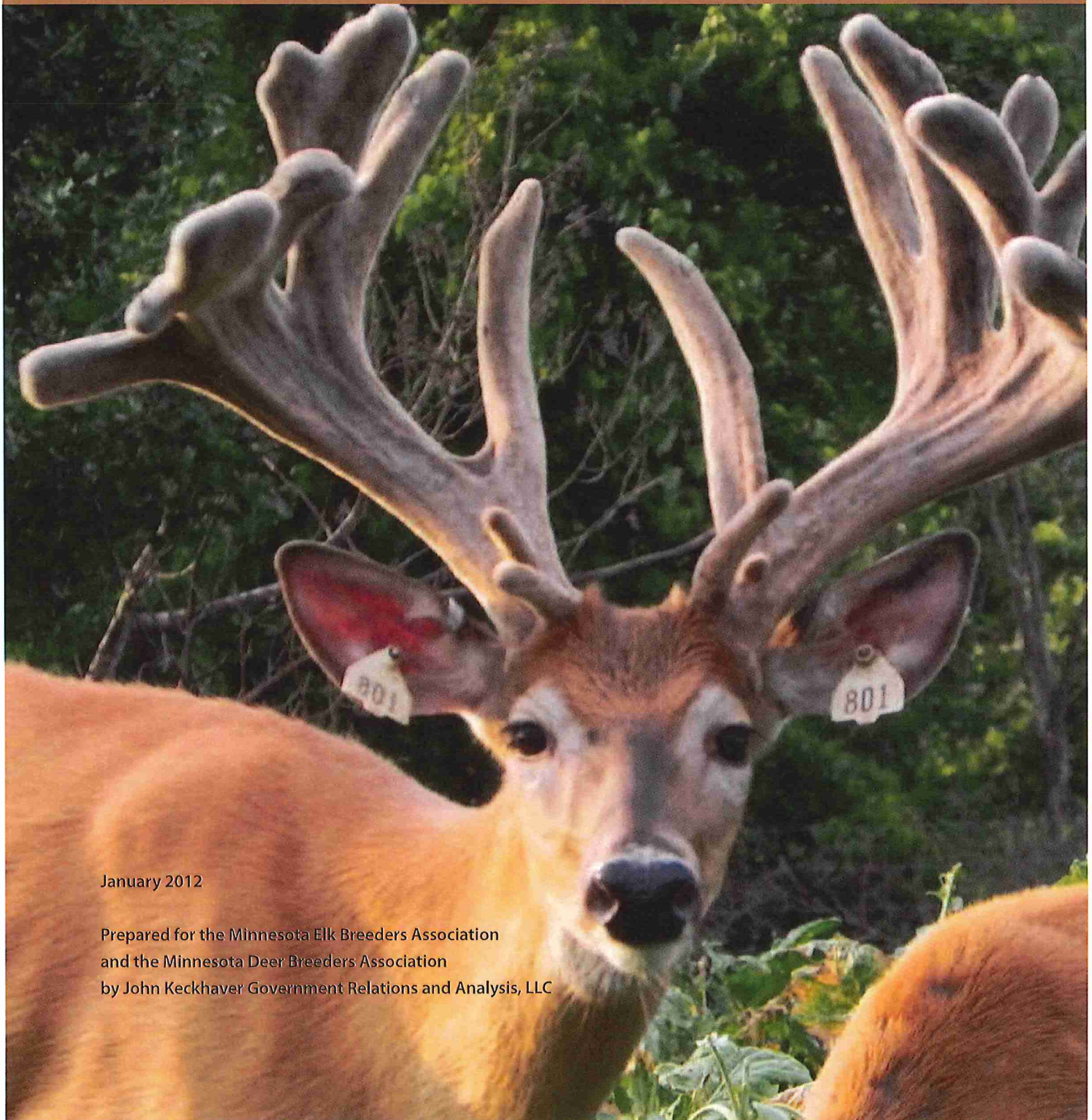


The Economic Impact of Cervid Farming in Minnesota



January 2012

Prepared for the Minnesota Elk Breeders Association
and the Minnesota Deer Breeders Association
by John Keckhaver Government Relations and Analysis, LLC

Resources

The author would like to thank the Minnesota Board of Animal Health in St. Paul, Minnesota for their assistance and for providing data regarding the number of cervid herds in Minnesota and their locations. Also utilized for this report is the 2007 U.S. Census of Agriculture (available at http://www.agcensus.usda.gov/Publications/2007/Full_Report/index.asp). This census is conducted every five years and the 2012 census is currently underway. Another valuable resource on cervid farming has been the 2007 national study conducted by researchers at Texas A&M University, Economic Impact of the United States Cervid Farming Industry (2007)(available at <http://www.nadefa.org/images/stories/cervid-report.pdf>). The economic multiplier determined by researchers for that study is used in our analysis of the economic impact of cervid farming in Minnesota. Also, Cornell University's 2001 study titled Agricultural-Based Economic Development: Trends and Prospects for New York is used for its look into the employment impacts of agricultural industries. All other data contained in this report was gleaned from surveys sent to all cervid farming operators in Minnesota during 2011. 582 surveys were delivered and 166 were returned for a response rate of 29 percent.

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Executive Summary

Cervids, or cervidae, include Elk, Fallow Deer, Mule Deer, Red Deer, Reindeer, Sika Deer and Whitetail Deer. The following are key facts surrounding cervid farming in Minnesota.

Minnesota's Cervid Industry Background

- Minnesota ranked 1st nationally in the number of elk and 3rd in the number of commercial elk farms according to the 2007 U.S. Census of Agriculture.
- According to the same census, Minnesota ranked 5th in the number of commercial deer farms and 6th in the number of deer at these farms.
- The average cervid farm in Minnesota protects 43 acres of land.
- As of November, 2011 there were 560 registered cervid herds in Minnesota.
- The number of herds has decreased steadily since 2005 when there were 757 herds.
- Despite the decline, cervid farming remains widespread throughout Minnesota. Cervid herds are located in 76 of Minnesota's 87 counties. 70 counties boast a deer farm and 63 counties an elk farm.
- The 2007 U.S. Census of Agriculture (the latest agriculture census completed at this time) found 199 commercial elk farms and 274 commercial deer farms in Minnesota (defined as having at least \$1,000 in sales that year).

Current Economic Impact

- The cervid industry supports an estimated 1,287 jobs in the state (240 full time and 1,047 part time).
- The total estimated annual economic impact of cervid farming in Minnesota is \$17.6 million.

Future Prospects for the Industry in Minnesota

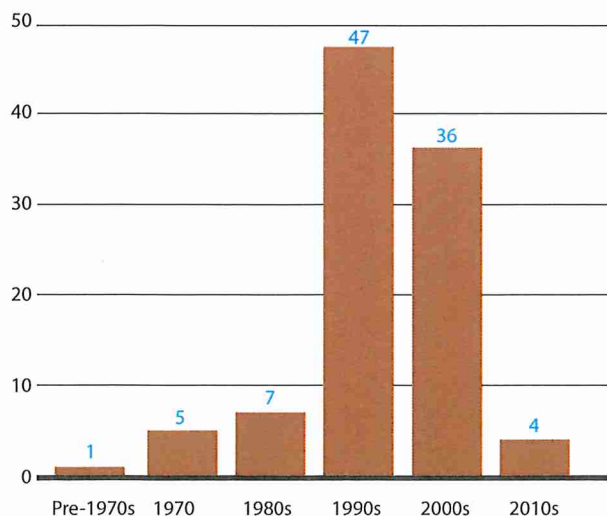
- 41 percent of Minnesota cervid farmers expect to increase the number of cervids stocked on their farms in the near future.
- 30 percent expect to increase the acreage used to support their cervid operations.
- 51 percent of Minnesota's cervid farmers expect to increase their sales in 2011 over 2010.
- 45 percent expect to increase their expenditures in 2011 over 2010.
- 63 percent consider their cervid operations as part of their long term business/retirement plan or carrying on of the family farm.



Cervid Farming in Minnesota

Cervids, or cervidae, include Elk, Fallow Deer, Mule Deer, Red Deer, Reindeer, Sika Deer and Whitetail Deer. Many cervid farms in Minnesota have been around for decades, with many others only recently started. The average length of time in operation for Minnesota cervid farms is 14 years and 10 months. Figure 1 shows the breakdown by decade.

Fig. 1: Percent of MN Cervid Farms Created by Decade



Cervid farming often serves to protect the environment through improved land use. 64 percent of Minnesota cervid farmers surveyed for this analysis have converted highly erodible or marginal cropland into pasture for their cervid operations. Figure 2 shows the average size of cervid operations in Minnesota.

Fig. 2: Acreage Utilized in Average Cervid Operation

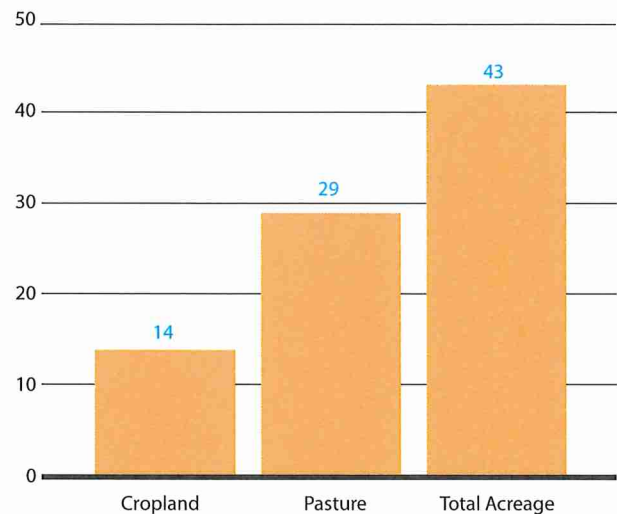


Fig. 3 Year (as of 1/1) Number of Cervid Herds

2005	757
2006	715
2007	679
2008	664
2009	648
2010	613
2011	593

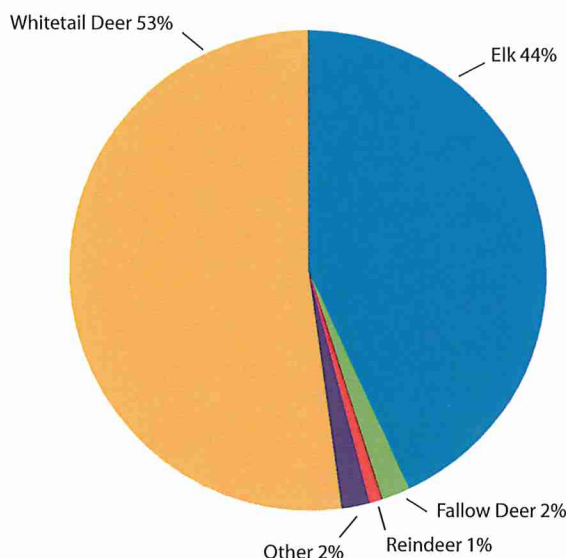
As of November, 2011, there were 560 registered cervid herds in Minnesota. The number of cervid farms in Minnesota has slowly decreased since 2005 as Figure 3 indicates.

Despite this decline, Minnesota remains a national leader in cervid farming. According to the 2007 U.S. Census of Agriculture, Minnesota ranked 3rd in the nation in

Stearns	41
Morrison	36
Wright	21
Todd	19
Wabasha (Tie)	18
Winona (Tie)	18
Otter Tail	16
Olmsted (Tie)	15
Fillmore (Tie)	15
Isanti (Tie)	15
St. Louis	13

Not surprisingly, cervid farms are primarily located in rural areas, but they are also widely distributed throughout the state's counties. Cervid herds are located in 76 of Minnesota's 87 counties. 70 counties boast a deer farm and 63 counties an elk farm. Figure 4 above lists the ten counties in Minnesota with the most deer and elk farms. The state map to the right shows the total number of cervid farm operations per county in Minnesota.

Fig. 5: Percentage of Farmed Cervids in MN, by Species

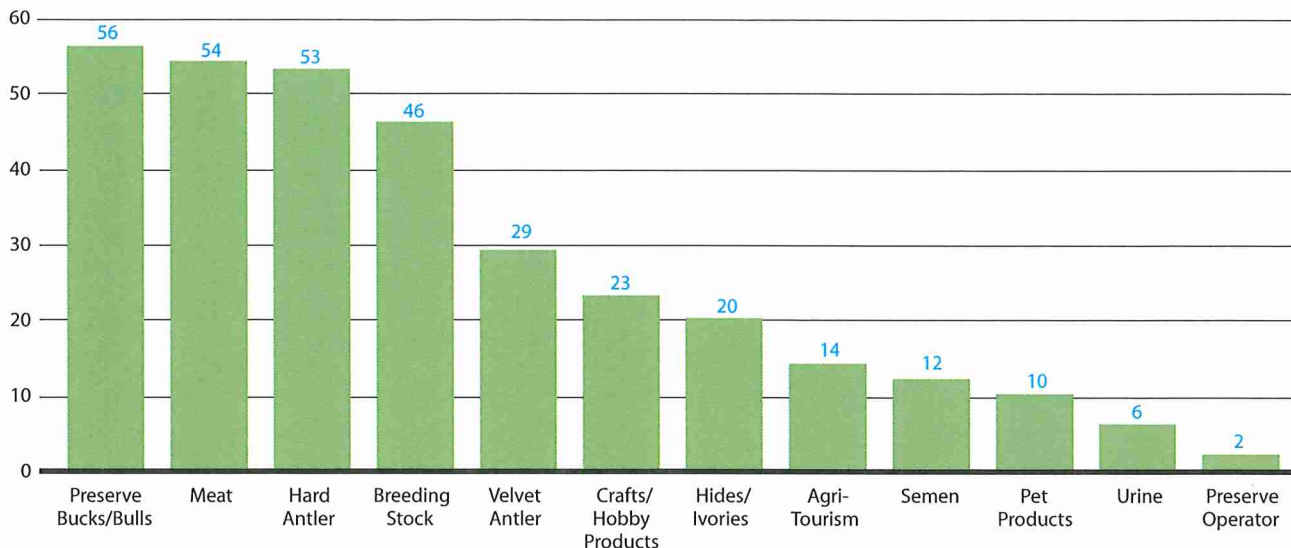


MIN Board of Animal Health
December 21, 2011

**562
Total Premises**

County	Premises
Adams	1
Anoka	9
Becker	7
Benton	7
Big Lake	2
Blue Earth	8
Carlton	2
Cass	10
Chippewa	5
Chishago	7
Crow Wing	10
Dakota	6
Dodge	7
Douglas	9
Faribault	4
Fillmore	15
Hennepin	4
Houston	12
Isanti	6
Itasca	10
Jackson	5
Kandiyohi	5
Kearney	5
Kellogg	2
Lac Qui Parle	4
Lake	2
Lake of the Woods	2
Lake Superior	2
Le Sueur	4
Lincoln	4
Lyon	2
Mankato	2
Marshall	2
McLeod	8
Martin	1
Meeker	5
Mille Lacs	5
Murray	1
Mower	6
Nobles	1
Norman	2
Pennington	2
Pine	7
Pope	2
Polk	6
Red Lake	2
Redwood	5
Renville	6
Rice	8
Rock	2
Scott	3
Shelburne	10
Shiboleth	2
St. Louis	13
Stearns	41
Stevens	2
Swinburn	2
Todd	5
Traverse	1
Union	2
Wadena	5
Washington	4
Watonwan	1
Webster	2
Winona	18
Wright	21
Yellow Medicine	6
Ziebach	2

Fig. 6: Percentage of Cervid Operations Which Provide Certain Products/Services



The Economics of Cervid Farming in Minnesota

The impact of cervid farming on local rural communities can be significant. According to a national study conducted in 2007 by researchers at Texas A&M University, cervid farming was at that time one of the fastest growing industries in rural America. Niche agricultural industry contributors such as cervid farming can also help sustain small farming operations during difficult economic times.

Fig. 7: Sales Methods Used by MN Cervid Farmers, %

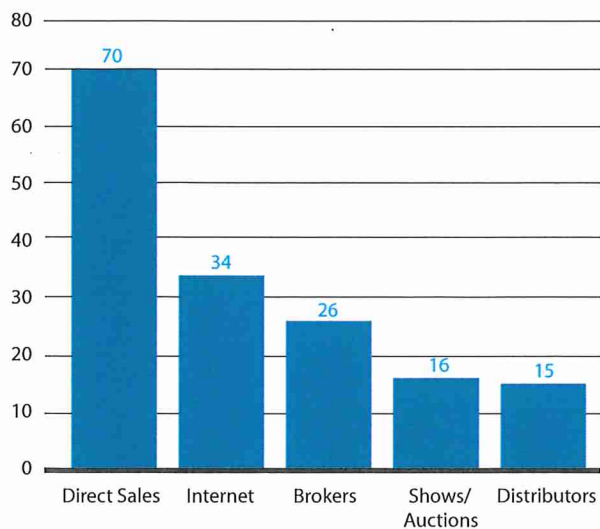
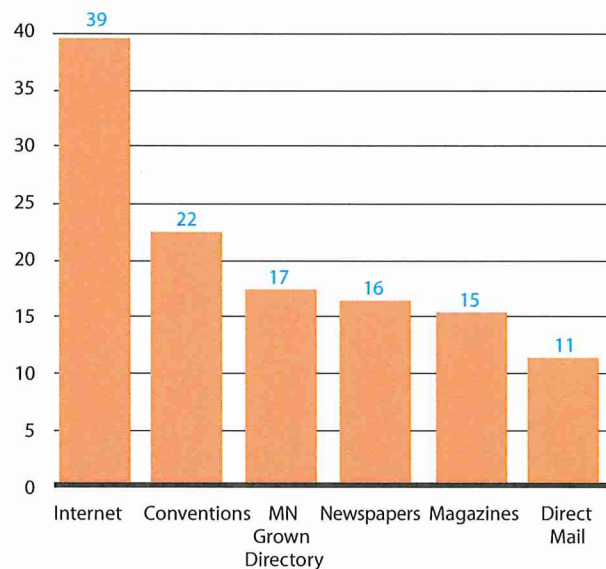


Fig. 8: Marketing Methods Used by MN Cervid Farmers, %



Sales

Cervid farmers provide a wide range of products and services to consumers. Preserve bucks/bulls, meat, hard antler and breeding stock top the list in sales followed by velvet antler. Velvet antler produced in Minnesota is used for medicinal purposes all throughout Asia. A high percentage of cervid farmers also market byproducts such as hides, ivories and urine, which is widely used by hunters to attract deer. Average 2010 per farm sales from those farms reporting sales figures for this analysis was \$11,607.

Figure 6 shows the various products and services available at the state's cervid farms along with the percentage of farms which offer each.

Cervid farmers utilize a number of sales and marketing methods as seen in Figures 7 and 8.

Expenditures

Cervid farmers spend funds—largely in their local communities—on a variety of items, including: feed, livestock, labor, veterinary work, and many other goods and services. Figure 9 shows the average expense level for a number of different expenses reported by survey respondents who incurred that expense in the past year (not all respondents incurred all of the expenses listed).

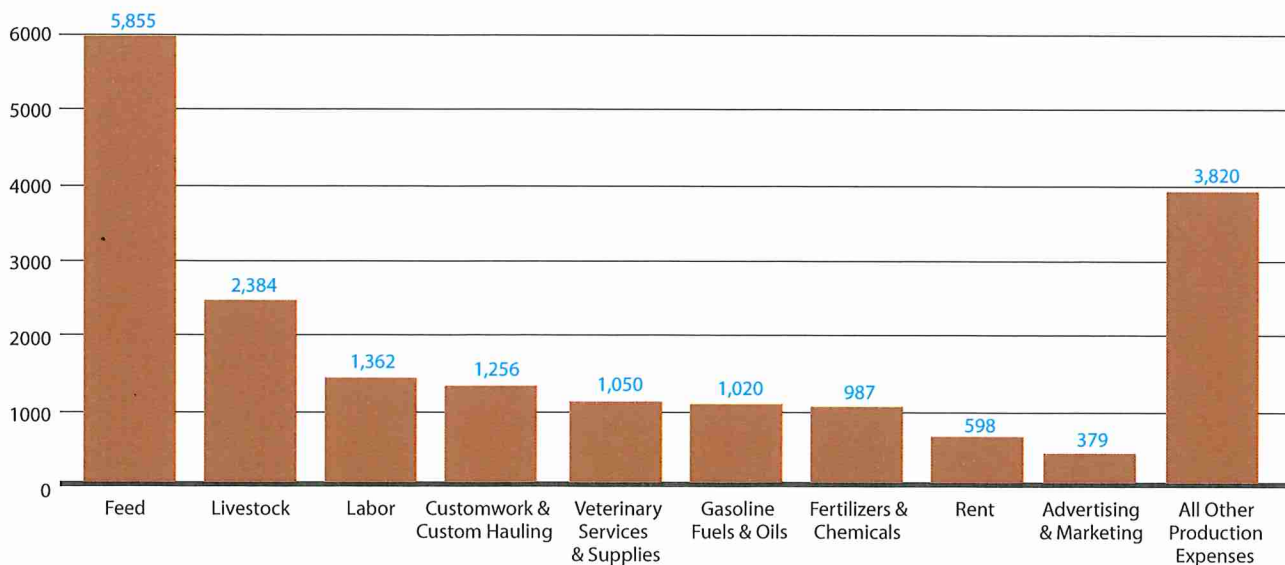
Jobs and Overall Economic Impact

The economic and employment impacts of any business spreads beyond those actually engaged in that industry. A portion of a farm's revenue is used to support and supply that business and those expenditures in turn support other businesses and jobs at other businesses. The economic and employment impacts are therefore described and computed as direct and indirect.

As noted above, average sales reported by survey respondents totalled \$11,607. This results in a state-wide estimate of \$6.9 million in direct economic impact in 2010 from all cervid farming operations in Minnesota.

Using the cervid farming economic multiplier of 2.55 determined by researchers at Texas A&M produces an estimated total economic impact of \$17.6 million statewide. Cervid farming provides jobs around the state. Based on survey responses, 894 jobs are directly supported by cervid farming in Minnesota. Using the established employment multiplier for cervid operations of 1.44 results in an estimated total jobs supported by cervid farming of 1,287 (1,047 part time and 240 full time).

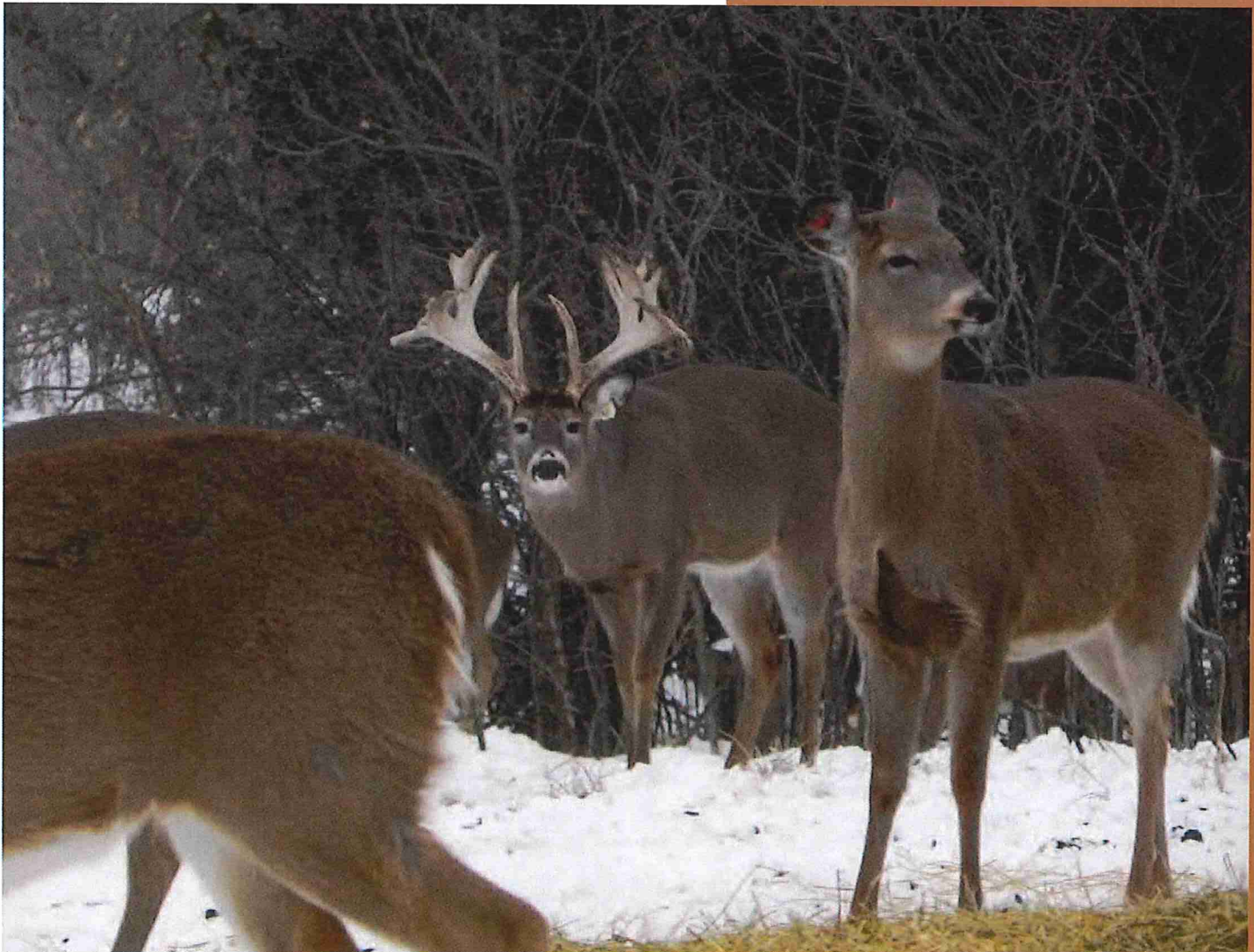
Fig. 9: Average Annual Expenditures (\$) per Farm by Type



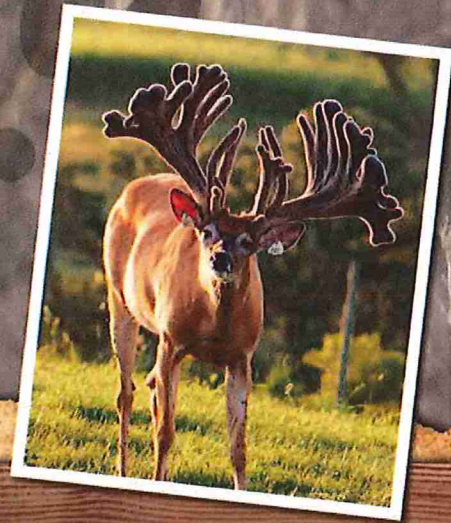
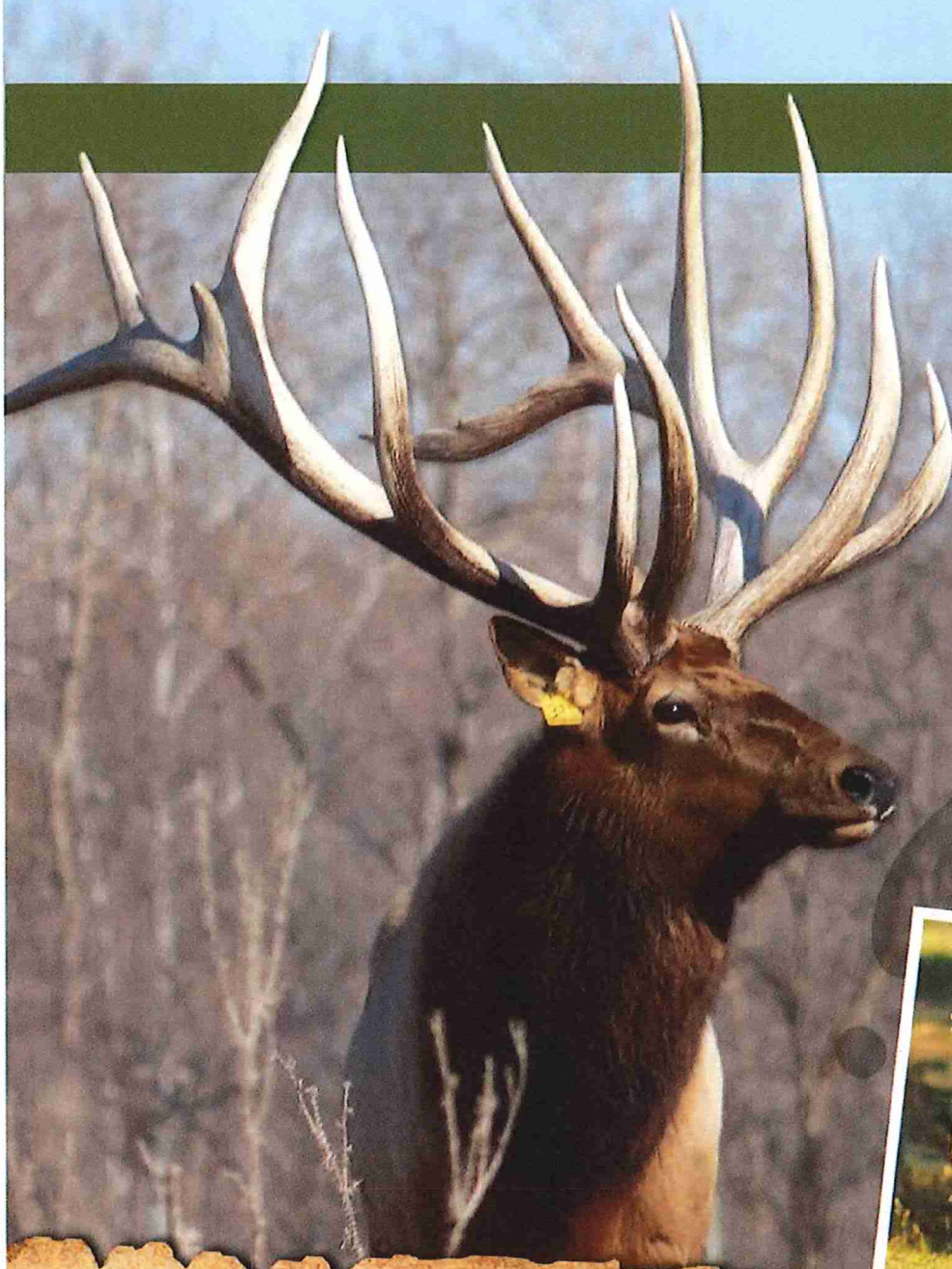
Conclusion

Minnesota is clearly a national leader in the cervid industry, one which can reap big rewards for rural economies and farmers alike. Although there has been a decade long decline in the number of registered herds in the state, public demand for meat and antlers are steadily increasing. Over 40 percent of Minnesota cervid farmers expect to increase the number of animals they raise. Over 50 percent expect 2011 sales to top 2010 sales and 30 percent look to expand their acreage. This industry is clearly poised to reverse this downward trend into a future of growth. Most cervid farms are small agricultural businesses which are very important to Minnesota's rural economy. As survey respondents clearly pointed out, for many of them cervid farming is a way to further protect their family farm and they look forward to continuing that tradition in the years to come. ■

Estimated total annual
economic impact from
cervid farming in
Minnesota is \$17 million.
And the total estimated
number of jobs supported
by the industry are 1,287.



December 2017



Minnesota Cervid Farming and its Economic Impact

Prepared by John Keckhaver Consulting, LLC, of Madison, Wisconsin

Methodology and Sources

This report is an update to one written and released in 2011. For that report, surveys were distributed to cervid herd keepers throughout Minnesota. The same process took place again early in 2017. 453 surveys were distributed and 140 returned, for a response rate of 31 percent. The 2012 report includes 2010 financial data (sales, expenditures, employment) reported by survey respondents, and this report includes financial data from 2016.

Identical survey questions were used for this report to create as clear a comparison as possible with the earlier responses. It should be noted, however, that the two groups of survey respondents were not identical.

Also included in this report is information provided by the Minnesota Board of Animal Health and that gleaned from the 2012 USDA Census of Agriculture.

In this report, the terms "cervid farm" and "cervid farmer" are used to refer to cervid herd keepers regardless of the size of their operation or any specific financial parameters. The USDA's Census of Agriculture, by comparison, uses the term "farm" to refer to a business with over \$1,000 in annual sales. That is the reason why the number of cervid farms reported by the USDA is much lower than the number of cervid herds reported by the Minnesota Board of Animal Health.

Any questions regarding the methodology or data used in this report can be directed to the author at the following:

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Executive Summary

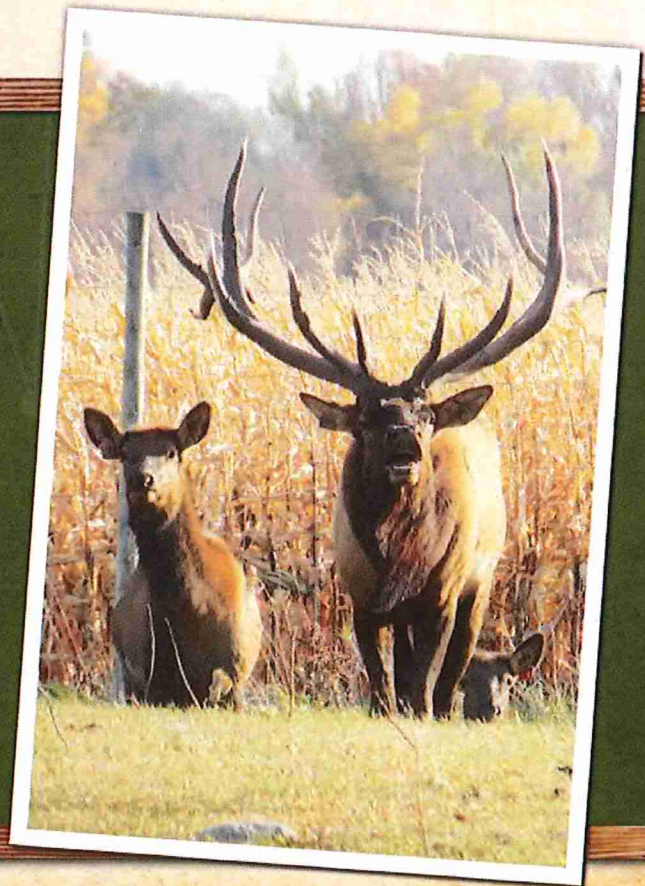
Minnesota has long been a leader in cervid farming, ranking high nationally in both the number of herds of elk and deer as well as the number of animals maintained. Minnesota's cervid farmers provide a wide range of products and services through their operations and impact their local and regional economies. Below are a few key facts related to the size, scope, and impact of Minnesota's cervid industry.

Size and Scope

- Minnesota ranked first nationally in the number of elk maintained (4,610) according to the USDA's 2012 Census of Agriculture, and second nationally in the number of Elk farms (151).
- Minnesota ranked fifth nationally in both the number of deer (6,229) and number of deer farms (174) according to the USDA's 2012 Census of Agriculture.
- According to the Minnesota Board of Animal Health, there were 453 registered cervid herds in the state in 2017.
- In 2017, for the first time in over ten years, the number of registered cervid herds increased in Minnesota.
- Seventy-six out of Minnesota's eighty-seven counties contained at least one cervid herd.
- The average cervid farm in Minnesota protects twenty-nine acres of land.
- Forty-six percent of survey respondents report having converted highly erodible or marginal cropland into pasture to support their cervid herds.

Economics of Cervid Farming in Minnesota

- Cervid farmers reported spending an average of approximately \$21,000 in 2016 to supply and maintain their herds, an increase of over thirteen percent since 2010.
- Minnesota cervid farm sales averaged \$47,490 in 2016, according to survey respondents, an increase of over 400 percent since 2010.
- The cervid industry in Minnesota supported an estimated 759 jobs in the state in 2016 (164 full-time and 595 part-time).
- The overall estimated annual economic impact of cervid farming in Minnesota in 2016 was \$24.2 million, an increase of 37 percent since 2010.



Minnesota Cervid Farming Basics

Species Maintained

Several species of cervids, or Cervidae, are raised and kept domestically in Minnesota as they are in many states around the country. Minnesota cervid farmers responding to surveys in the Spring of 2017 reported the following species in their operations: whitetail deer, sika deer, reindeer, mule deer, fallow deer, muntjac deer, red deer and elk. As noted later in this report, caribou herds are also maintained within the state.

Figure 1 below shows the prevalence of each of these reported, with whitetail deer and elk accounting for over ninety percent of the cervids maintained in Minnesota.

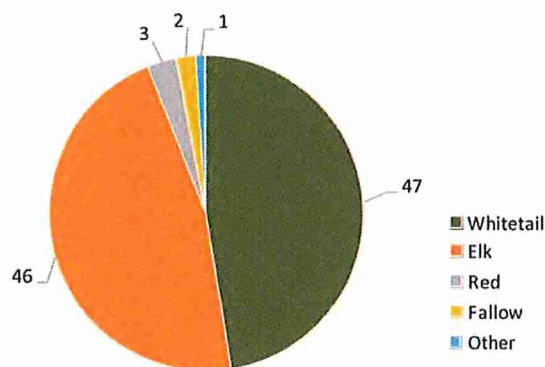


Figure 1: Percentage of Farmed Cervids by Species in MN, 2017

The most notable change between surveys conducted in 2011 and in March of 2017 regarding the types of cervids farmed is the reduction in whitetail deer, which accounted for fifty-three percent of cervids in the first survey effort and forty-six percent in 2017.

Age and Size of Cervid Farms

Most of the cervid farms that exist today in Minnesota were started in the 1990s and 2000s, though approximately twenty-five percent were started in the 2010s (obviously a decade not yet complete). The average operational span of survey respondents as of March 2017 was seventeen years and three months. Figure 2 shows the start dates by decade of today's cervid farms in Minnesota.

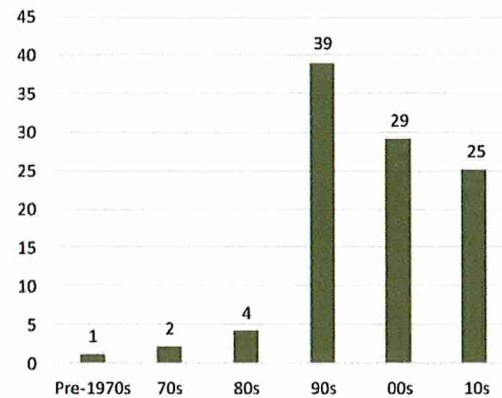


Figure 2: Percentage of MN Cervid Farms Created by Decade

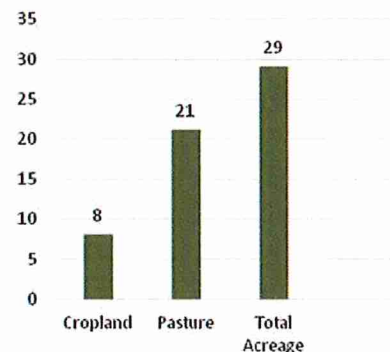


Figure 3: Average Acreage Utilized

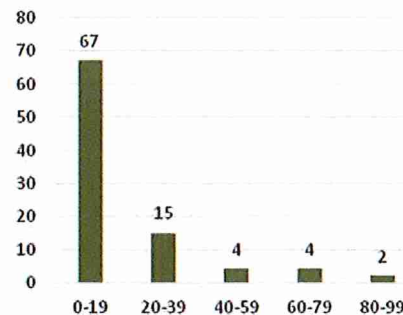
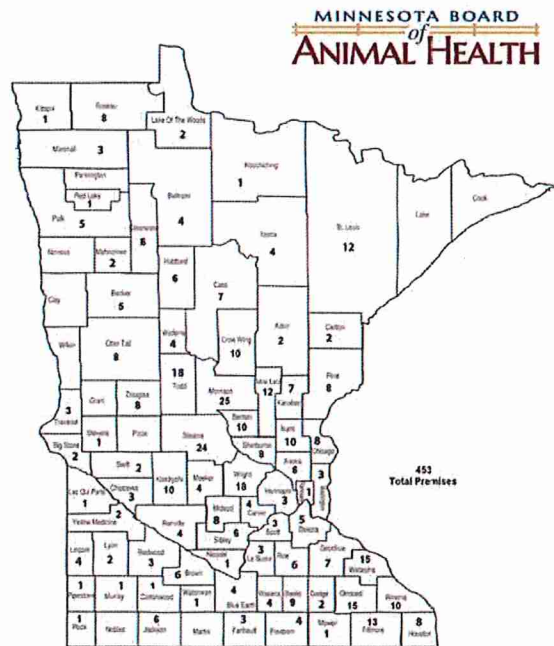


Figure 4: Breakdown of Acreage Utilized (% of Respondents)

Year	Deaths
2008	664
2009	648
2010	613
2011	593
2012	532
2013	0
2014	482
2015	468
2016	449
2017	453

Total Farmed Cervidae Herds by County



Looking more specifically at the past two years, the Minnesota Board of Animal Health reports the following information.

Table 1: Herd Figures by Year

	2016	2017
Total Registered Herds	449	453
Herds with Elk	126	126
Herds with White-tailed Deer	315	319
Herds with Other Cervid Species	55	56

Table 2, also provided by the Minnesota Board of Animal Health, provides an inventory of the cervids, by type, in 2016 and 2017.

Table 2: Inventory of Cervids by Year

Type of Cervid	2016	2017
Caribou	8	8
Elk	3885	3867
Fallow Deer	244	231
Moose	7	7
Mule Deer	33	33
Muntjac	34	34
Red Deer	224	226
Reindeer	88	87
Sika Deer	56	56
Unspecified	55	58
Whitetail Deer	5725	5737
Total	10383	10368

Most counties in Minnesota (seventy-six out of eighty-seven) contain at least one cervid herd. The following table shows the top ten counties (and ties) by number of cervid herds as of March 2017.

Table 3: Top Ten Counties by Herd Total

County	Number of Herds
Morrison	25
Stearns	24
Todd	18
Wright	18
Olmsted	15
Wabasha	15
Fillmore	13
Mille Lacs	12
St. Louis	12
Benton	10
Crow Wing	10
Isanti	10
Kandiyohi	10
Winona	10

Economic Impact

Products and Services

Cervids are raised for sale or to yield other products. These products vary from hard antler used for dog chews or in the craft and hobby industry, velvet antler used in nutritional supplements, to meat, trophy stock animals and more.

While cervid farming pales in comparison to more common livestock or crop production, cervid farming does have a positive economic impact on many families in the state and their local communities. These agribusinesses with their diverse product offerings provide many opportunities for small scale farming operations to generate income.

Figure 6 below shows the wide range of products and services offered by cervid farmers and the percentage of those responding to surveys that provide each. The chart also includes the results from surveys conducted in 2011 as a comparison.

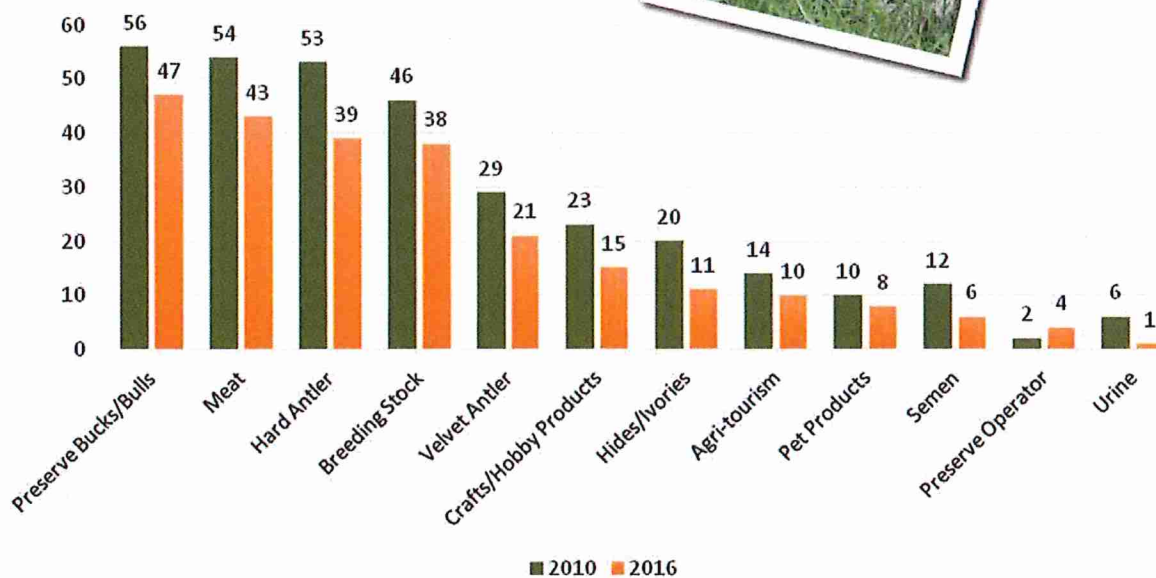


Figure 6: Percentage of Cervid Farmers Providing Various Products/Services

Sales

Cervid farmers reported an average sales total of \$47,490 in 2016. This amount is significantly higher than that reported in the earlier surveys conducted in 2011. That average sales figure was \$11,607 for 2010. Identical questions and categories were used in both surveys related to sales. The large difference may be attributable to the fact that the respondent groups were not, as noted earlier, identical, and there were several large cervid farming operations which returned surveys in the most recent effort.

The two charts below show the sales and marketing methods used by cervid farmers in both survey years.

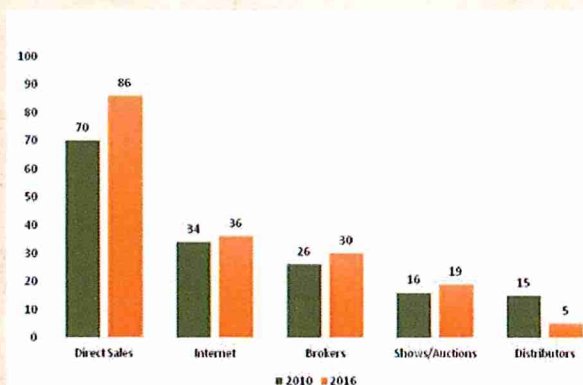


Figure 7: Sales Methods Used by MN Cervid Farmers, %

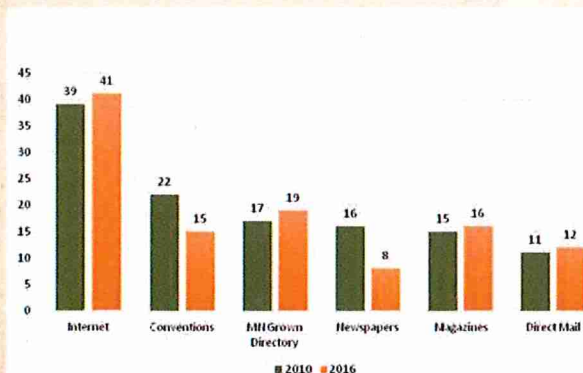


Figure 8: Marketing Methods Used by MN Cervid Farmers, %

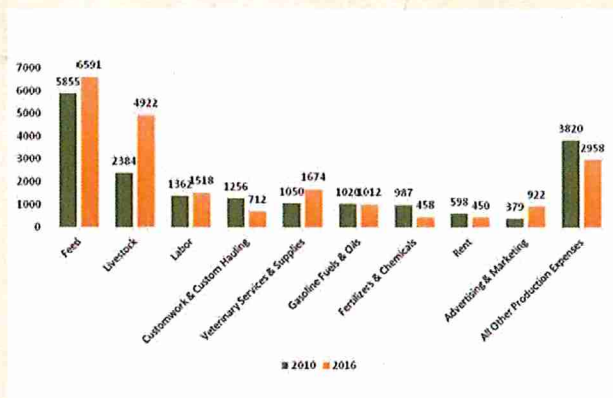


Figure 9: Average Annual Expenditures (\$) per Farm by Type

Expenditures

Cervid farmers expend funds in their community and beyond to maintain their herds and run their businesses. Figure 9 shows the various costs they incur and the average reported expenditure amount from survey respondents in the two survey years. The average total expenditures reported increased by over thirteen percent to \$21,217.



Resulting Economic Impact

The economic impact of any industry is felt both directly and indirectly. Farm revenue is used to support other businesses when that farmer buys their products or supplies, such as fuel, fertilizer, advertising, and the other items listed in Figure 9. Considering the average expenditures in 2016 along with the number of registered herds in the state that year results in a direct economic impact of \$9.5 million.

Along with the direct impact, economic activity is spurred indirectly through these activities. A common "economic multiplier" used when estimating the impact of cervid operations is 2.55 as determined by researchers at Texas A&M University. This results in a total (direct and indirect) economic impact of \$24.2 million in 2016.

Jobs are in turn supported, both directly on a farm and indirectly through the extended economic activity. Survey respondents report supporting an average of .94 part-time jobs and .26 full time jobs in 2016. Using the established employment multiplier for cervid operations of 1.44 results in an estimated 759 total jobs supported by cervid farming in Minnesota in 2016 (595 part-time and 164 full-time).

Conclusion

Cervid farming continues to have a significant economic impact for families and communities throughout Minnesota. Notably, the decline in the number of cervid farming operations in the state, which mirrored the decline nationally, has stabilized. Combined with the increased livestock expenditure figures reported through surveys (more than doubling between 2010 and 2016), it appears likely that the industry will continue to rebound and see growth in coming years.

