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Economic Impacts of Veterinary Medicine in Ohio

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Economic Impacts of Veterinary Medicine in Ohio

by

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SYNOPSIS

Introduction

This research defines and quantifies selected economic factors associated with the veterinary medical profession in Ohio. Food animal agriculture is already a significant force within the state's economy. Veterinary medical professionals help maintain the health and well-being of both food animals and companion animals. In addition, the profession contributes expertise through various activities designed to assure a safe food supply for all citizens. The veterinary medical profession is of particular significance for all Ohio citizens because of the role veterinary medical professionals' play in helping assure a safe food supply and maintaining the health of food animals and companion animals. This research highlights the direct economic contribution of veterinary medicine and analyzes the geographic distribution of practicing veterinarians within Ohio.

It is always difficult to quantify the economic contribution of a diverse and complex group of professionals contributing in numerous ways to the well-being of Ohio's citizens. However, economic modeling techniques, such as input-output models, allow the analysis of sector economic contributions in a consistent and methodologically defensible way. This synopsis provides the highlights of the Ohio analysis from the detailed report.

Analysis and Methods

This study is based on an input-output model, using 2008 input-output relationships among every industry in Ohio that is used to estimate numerous metrics that quantify economic impact. The primary metrics are output, contribution to gross state product (GSP), and employment. Another vital metric is the economic multiplier for various sectors of the Ohio economy. The multipliers allow estimation of both the direct and indirect or secondary economic impacts of a particular industry.

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With regard to methods, all data analyzed is for the 2008 calendar year. All industry definitions throughout adopt the North American Industrial Classification System (NAICS) for defining industries. This is customary for this type of analysis. A six-digit code precisely defines the industry being analyzed and is the same definition throughout all of North America, not just the United States.

Findings

Veterinary medicine is engaged in maintaining the health of food animals and companion animals, in assuring a safe food supply, in scientific research and development (R&D), in teaching and R&D in academia, and in numerous novel activities such as government agencies (The Ohio Department of Agriculture, for example), military, zoos, and working for private firms. Most veterinarians are self-employed; nationally it is estimated that 80 percent of the veterinarians are self-employed and Ohio is not likely to be substantially different from the national number.

The direct role of veterinarians in maintaining the health of food animals is one of their better-known activities. The aggregate contribution of the food and agriculture sector to the general economy of Ohio is one important element of quantifying the economic impact of veterinary medicine. The agrifood sector is defined in a supply chain context consisting of broad agrifood sectors including farm inputs, agricultural production, food manufacturing, food wholesaling and retailing, and food service. The analysis indicates that for 2008 the food and agricultural cluster of Ohio's economy contributed 11 percent of the output, added 8 percent to Ohio's gross state product (GSP), and accounted for 13.5 percent of the total employment in the Ohio economy.

In 2008, the Ohio economy generated a gross state product (GSP) of $471.5 billion. The food and agricultural cluster's share of this GSP was $39.0 billion, or $8.27 of each $100 of Ohio GSP. For 2008 the contributions to GSP for the five components of the agrifood cluster are $1.6 billion for farm inputs, machinery, and professional services; another nearly $3.8 billion from agricultural production; about $10.6 billion from processing; an additional $12.3 from food wholesaling and retailing; and another $10.2 billion in food services.

The economic impact of veterinary medicine is $1.96 billion on Ohio. This is the amount of output added to the Ohio economy from veterinary medicine in 2008, considering the direct, indirect, and induced effects of the sector. In terms of jobs, the total influence of veterinary medicine is an additional 33,382 in Ohio. Moreover, veterinary medicine contributes a total of $1.4 billion to Ohio's gross state product.

The direct economic activity from veterinary medicine in Ohio also is substantial. There are 14,778 employed directly in the veterinary medicine sector. The direct output of veterinary medicine is estimated at $1.1 billion in Ohio. The direct contribution ofveterinary medicine to GSP is estimated at $503.6 million. There are nearly 1,100 veterinary medicine establishments in Ohio with approximately 11,780 employees.

Veterinary medicine is a partner in Ohio's livestock, equine, food animal industries, in addition to companion animals. Many sectors of the economy rely either directly or indirectly on the expertise and services of veterinarians. For 2008 in Ohio, it is estimated that there are over 3,627 establishments in various industries that are related to veterinary medicine, Table 1. These establishments employed a total of 59,088 and had an annual payroll in excess of $3.0 billion, Table 1. The industries included in this mix range from pet food stores to animal shelters and zoos.

Companion animal population in Ohio is substantial. Ohio has an estimated dog population of 3,210,480; a cat population of 3,621,949; pet bird population of 497,828, and a horse population of 320,032. The distribution of companion animals by county within the state is concentrated in urban and suburban areas of the state.

Food animal production in Ohio includes beef cattle, dairy cattle and milk, hogs, broilers, eggs, other poultry and miscellaneous farm animals such as sheep. This sector contributes a total economic output in Ohio of $2.7 billion and contributes $846.9 million to GSP. This food animal sector of the agricultural economy adds another 27,566 jobs to employment.

A recent analysis of the national situation on veterinarians reveals that there is a growing shortage of veterinarians nationwide. The most critical shortage is likely to be for veterinarians who care for animals raised for food, serve in rural communities, and have training in public health. According to the American Veterinary Medical Association, the nation's food supply could at risk along with efforts to protect humans from zoonotic diseases. There are space constraints at the country's 28 veterinary colleges, which can graduate only about 2,500 students a year combined. The federal government employs more than 3,000 veterinarians. This is only a small percent of the federal workforce but these veterinarians play a crucial role in helping to protect people and the economy from animal diseases.

Table 1. Economic Importance of Sectors Related to Veterinary Medicine, Ohio, 2008

Industry Definition	Description	Number of Employees	Annual Payroll ($1,000)	Number of Establishments
115210	Equine Boarding	389	8,075	97
311111	Dog and Cat Food Manufacturing	1,086	51,574	12
311119	Other Animal Food Manufacturing	1,299	61,409	55
325412	Veterinary Medical Preparations Manufacturing	3,469	231,627	20
339112	Veterinarians' Instruments and Apparatus Manufacturing	3,610	210,909	49
423490	Veterinarians' Equipment and Supplies Merchant Wholesalers	1,691	80,403	79
424210	Veterinarians' Medicines Merchant Wholesalers	7,068	380,895	717
424910	Farm Supplies Merchant Wholesalers	2,418	98,240	262
453910	Pet and Pet Supply Stores	4,307	66,606	359
541710	Biotechnology Research and Development Laboratories or Services in Veterinary Sciences (including biotechnology R&D)	17,182	1,428,011	404
541940	Veterinarians: Offices, Practice, Testing Services	11,780	328,599	1,087
711212	Racetracks	1,003	25,452	32
712130	Zoological Gardens and Petting Zoos	1,810	46,328	22
812910	Pet Boarding and Animal Shelters	1,976	27,203	432
	Totals	59,088	3,045,331	3,627

Notes and Source: Computed from U.S. Census Bureau, *County Business Patterns*, 2008, Washington, DC [http://www.census.gov/econ/cbp/index.html] using the North American Industrial Classification System (NAICS) 6-digit industry definitions.

Economic Impacts of Veterinary Medicine in Ohio

INTRODUCTION

Rarely does a profession contribute to the well-being of society and the average citizen to the degree of veterinary medical professionals. The profession not only cares for sick animals, maintains the health of well animals, but also contributes significant expertise to a wide array of commercial areas such as food safety and diagnostic capabilities, in both industrial and government agency settings. Numerous veterinarians are engaged in private practices or are employed by public sector agencies, such as the Ohio Department of Agriculture. In addition, Ohio has an internationally recognized College of Veterinary Medicine at The Ohio State University. This College engages many veterinarians as academic faculty along with numerous ancillary professionals that work in the teaching hospital at the University.

This research defines and quantifies selected economic factors associated with the veterinary medical profession in Ohio. Animal agriculture is already a significant force within the state's economy. Veterinary medical professionals help maintain the health and well-being of food animals and companion animals. In addition, the profession contributes expertise through various activities designed to assure a safe food supply for all citizens. The veterinary medical profession is of particular significance for Ohio because of the linkages it provides between the state's food supply and its agricultural sectors.

It is not easy to quantify the economic contribution of a diverse group of professionals contributing in numerous ways to the well-being of Ohio's citizens. However, there are economic modeling techniques, such as input-output models, that allow the analysis of sector economic contributions in a consistent and methodologically defensible way. The broad goals of this applied research is two-fold: 1) to determine the economic impact of the veterinary medical profession on Ohio's aggregate economy; and 2) to analyze selected spatial aspects of the at-risk animal populations and the spatial distribution of practicing veterinarians. The analytical framework to analyze the economic contribution of the veterinary medical profession is a sophisticated economic modeling technique known as input-output modeling.

This study provides the first economic analysis of veterinary contributions to Ohio. The research results assist in understanding the characteristics and economic magnitude of veterinary medical professionals, provides a benchmark for political action committees, and more generally, provides information describing the full scope of veterinary medicine in Ohio. The data and information developed in this project is of interest to policy-makers, the veterinary medical profession, and the food and agricultural industries. This research provides information vital to understanding the economic influence of the veterinary medical profession in the state of Ohio.

Objectives and the Report Layout

To accomplish the broad goals of this research, selected economic factors relevant to the economic influence of veterinary medical professionals in Ohio are defined and quantified. The four specific objectives of this research are to:

Objective 1: Evaluate the economic influence of veterinary medicine on Ohio's aggregate economy, including metrics such as output, employment, and contribution to Ohio's gross state product (GSP)

Objective 2: Analyze the economic value and location of at-risk animal populations relevant to the veterinary medical profession by region within Ohio

Objective 3: Evaluate spatial aspects of the veterinary medical profession within Ohio, analyzing which geographic areas may be underserved using benchmarking (ratio analysis)

Objective 4: Estimate the economic multipliers for the veterinary medical profession within Ohio.

This report will first define and describe the veterinary medicine workforce and its relationship to the macro economy. This description includes data on the number of veterinarians and broad specialties. The analysis presented provides information for both national and Ohio employment types. The number of establishments for private practice veterinarians in Ohio is part of the analysis as well.

The next portion of the analysis is devoted to the economic impact of the agrifood sector on the economy of Ohio. This information is key to understanding the economic contribution of veterinary medicine to the economy of Ohio. The economic metrics presented serve as a baseline measure to compare if there were no veterinarians in the state's economy. The estimates of the economic impact rely on input-output analysis, a standard economic modeling technique designed to capture interdependencies among various industries within an economy.

Various economic multipliers were estimated by sector within Ohio's economy (Objective 4 above but presented with the agrifood sector economic impact). These multipliers have varied utility over time in providing information useful in gauging the economic impact of changes that may occur involving veterinary medicine.

Objectives two and three above are presented together as the next portion of this report. This portion of the analysis presents the distribution of food animals and companion animals by county within Ohio. The most important conclusions from the analysis are provided in the synopsis, which are the first four pages of this document.

DESCRIPTION OF VETERINARY MEDICINE WORKFORCE

Identifying and defining the scope of veterinary medicine is based on key occupations as defined by the Standard Occupational Classifications (SOC) of the U.S. Bureau of Labor Statistics. The scope of veterinary medical professionals is defined by the BLS Standard Occupational Classifications (SOC). These are:

- SOC 29-1131: Veterinarians—diagnose and treat diseases and dysfunctions of animals. May engage in a particular function, such as research and development, consultation, administration, technical writing, sale or production of commercial products, or rendering of technical services to commercial firms or other organizations. Includes veterinarians who inspect livestock.
- SOC 29-2056: Veterinary technologists and technicians—perform medical tests in a laboratory environment for use in the treatment and diagnosis of diseases in animals. Prepare vaccines and serums for prevention of diseases. Prepare tissue samples, take blood samples, and execute laboratory tests such as urinalysis and blood counts. Clean and sterilize instruments and materials and maintain equipment and machines.
- SOC 31-9096: Veterinary assistants and laboratory animal caretakers—feed, water, and examine pets and other nonfarm animals for signs of illness, disease, or injury in laboratories and animal hospitals and clinics. Clean and disinfect cages and work areas, and sterilize laboratory and surgical equipment. May provide routine post-operative care, administer medication orally or topically, or prepare samples for laboratory examination under the supervision of veterinary or laboratory animal technologists, veterinarians, or scientists. Excludes "Nonfarm Animals Caretakers (SOC 39-2021).

Number of Veterinarians by Practice Type

As is true in most professions, veterinarians tend to specialize. A major distinguishing feature of specialization is veterinarians that engage in private practice compared to those that are salaried employees of a corporation, governmental agency, or NGO (nongovernmental organization). Those veterinarians that engage in private practice typically specialize in the care of the health and well-being of food animals or companion animals[2]. Veterinarians the are engaged in the public or corporate sectors of the economy specialize in various areas. Examples include veterinarians specializing in food safety for governmental agencies such as the U.S. Department of Agriculture or the Center for Disease Control, laboratory work for government or industry, or academic research and teaching assignments at various universities.

The number of veterinarians in Ohio for 2008 totaled 3,492 with about two-thirds of them engaged in private practice, Table 2. The majority of veterinarians are specialized

[2] Food animals are domestic farm animals and include their products (such as milk) that are part of the human food supply. Food animals include dairy cattle, beef cattle, hogs, and sheep and goats. Companion animals are pets that include dogs, cats, birds, and equine (horses).

in companion animal private practice, numbering 1,766 in 2008. For the same year there were a total of 187 veterinarians specialized predominantly or exclusively in food animal private practice, or only about 5 of each 100 licensed veterinarians in Ohio. Only 1 of every 100 Ohio veterinarians are in private practice exclusively for food animals.

About 65 of every 100 veterinarians in Ohio are engaged in private practice. There are 1,766 veterinarians in private practice specialized primarily in companion animals. This is roughly 1 in every 2 veterinarians licensed in Ohio and 3 in every 4 veterinarians in private practice in Ohio.

Table 2. Veterinarians by Employment Type, U.S. and Ohio, 2008

Employment Type	Ohio	
Private	Number	Percent of Total
Food animal exclusive	42	1.2
Food animal predominant	145	4.2
Mixed animal	164	4.7
Companion animal exclusive	1,543	44.2
Companion animal predominant	223	6.4
Equine	139	4.0
Other	28	0.8
Total Private	2,284	65.4
Public & Corporate		
College or university	237	6.8
Government	108	3.1
Uniformed services	24	0.7
Industry	122	3.5
Other	77	2.2
Total Public & Corporate	568	16.3
Unknown Employment	640	18.3
OHIO TOTAL	3,492	100

Source: Estimated from data provided by AVMA and the Ohio Veterinary Medical Licensing Board.

Another major classification of veterinarians is corporate and government. For 2008, there were 230 veterinarians in various specializations employed in corporations and at various governmental agencies, or about 6 of every 100 veterinarians in Ohio. These professionals are engaged in a wide array of activities in all levels of government (local, state, and federal) or are employed by corporations in numerous and varied industries.

Ohio Employment in Veterinary Medicine

Veterinarian establishments employ individuals trained to assist them with their practice. The types of employment in veterinary medicine are provided in detail above under the discussion of the Standard Occupational Classifications of the Bureau of Labor Statistics. Based on these definitions, there are a total of 1,087 establishments in Ohio that employ 11,780, Table 3. The numbers are based on NAICS 541940 which is defined as establishments of licensed veterinary practitioners primarily engaged in the practice of veterinary medicine, dentistry, or surgery for animals; and establishments primarily engaged in providing testing services for licensed veterinary practitioners.

Table 3. Number of Ohio Veterinary Medicine Establishments, by Size, 2008

Paid Employees Per Establishment	Number of Establishments
1-4	307
5-9	350
10-19	312
20-49	102
50-99	14
100-249	2
250+	0
TOTAL ESTABLISHMENTS	1,087

Source: For NAICS 541940 from U.S. Census Bureau, *County Business Patterns*. 2008.

There are major economic linkages of the veterinary medical professionals with various sectors of the economy. Useful insight into this is provided by tabulating the various sectors that are related through economic linkages to veterinarians, Table 1 (in the synopsis at the beginning of this document). Veterinary medicine is a partner in Ohio's livestock, equine, food animal industries, in addition to companion animals. Many sectors of the economy rely either directly or indirectly on the expertise and services of veterinarians. For 2008 in Ohio, it is estimated that there are over 3,627 establishments in various industries that are related to veterinary medicine, Table 1. These establishments employed a total of 59,088 and had an annual payroll in excess of $3.0 billion, Table 1. The industries included in this mix range from pet food stores to animal shelters and zoos.

ECONOMIC IMPACT OF THE AGRIFOOD SECTOR ON OHIO'S ECONOMY

Introduction

The interdependence captured in the input-output model arises because each industry employs the outputs of other industries as its raw materials. In addition, other producers or industries may use its output as a factor of production. To illustrate these economic linkages and interdependencies, consider corn production. Some output from this production activity is input into dry and wet corn milling. Some co-product output from milling is input into livestock feed (e.g. corn gluten feed), as is some output directly from corn production. Moving closer to the consumer level in the supply chain, some output from the milling industry is high-fructose corn syrup (HFCS) which in turn is input into the soft drink manufacturing industry.

Measuring these interdependencies and linkages can reveal how much of each industry's output is consumed by other industries and how much is available for final consumption. OHFOOD is developed so that the supply chain of the food and related agricultural cluster of the economy is highlighted. This cluster consists of five major sectors or components, all vertically linked and interdependent in an economic sense. The five major components comprising the agrifood cluster are 1) *farm inputs and machinery,* 2) *farm production,* 3) *processing of food and forestry products,* 4) *wholesaling and retailing of food and forestry products*, and ultimately the 5) *food service sector*.

For each industry or sector of the economy, estimates of direct purchases per dollar of output are obtained from the interindustry model. In addition, other economic measures of interest derived for each sector of the economy from the input-output model include total employment, income, contribution to gross state product (GSP), and the total dollar value of output. Each of these economic indicators measures different, yet related, economic flows among sectors within the economy. Income in the model is the money earned within the region from production and sales. Thus, income includes personal income (wage and salary income) as well as entrepreneurial income from business proprietor's profits and rents. Income is not just wage income for the region.

Sector Definition

An input-output model of the state's economy captures interindustry economic relationships and provides information on the relative importance of various sectors of the economy. **OHFOOD**, an acronym for **Ohio Food**, is an input-output model composed of 38 aggregated sectors defined in a manner to emphasize agriculture and processed food and forestry products, distribution and retailing of food and forestry products, and food consumption. Most of the 38 sectors are defined based upon the aggregation of similar industries. For example, the "Greenhouse, Nursery & Floriculture Production" sector of **OHFOOD** is defined to include the grass seeds industry, the greenhouse and nursery products industry, flower production, and the landscape and horticultural services industry.

The specific definition of sectors within **OHFOOD** was accomplished by maintaining substantial detail among the agricultural production and food-forestry processing/distribution sectors, but aggregating many other non-food industries into relatively large composite sectors. **OHFOOD** is comprised of 19 sectors related to food and agriculture and 19 sectors that are based on the general manufacturing and service sectors of the entire economy.

The specific food and related agricultural sectors of **OHFOOD** the form the cluster include farm inputs, equipment, and professional services (such as veterinary medicine); dairy cattle and milk production; beef cattle production; poultry and egg production; hogs and other farm animals (including sheep, goats, horses, and other livestock); grain production; soybeans and other oil crops; miscellaneous crops including hay, sugar, tobacco and nut crop production; fruits and vegetables; forestry, hunting and fishing; nursery and horticulture production; processed meat, fish, poultry and eggs; dairy processing; processed food and kindred products; grain milling and flour production; fats and oils processing; beverage processing (mostly soft drinks and liquor production); wood processing, paper production and wood furniture manufacturing; food and forestry wholesaling and retailing; and finally away-from-home food service including restaurants and institutions such as schools, hospitals and prisons, but excluding hotel and motel food service.

Each sector defined in the **OHFOOD** model is a grouping of industries that produce similar products or services. Appendix Table A-1 provides a detailed definition of each sector of the **OHFOOD** model based upon North American Industrial Classification System (NAICS) definitions. This table contains the precise definition of every sector within the **OHFOOD** model.

Methods

The **OHFOOD** model is based on *IMPLAN*, an input-output algorithm for the national economy using non-survey based data. *IMPLAN* is based on a procedure developed by the U.S. Forest Service for estimating input-output models for the United States or subregions (Alward).

Estimates of sectoral activity for final demand, final payments, industry output, and employment for the Ohio economy are based on the latest data available aggregating the detail for 504 industries of the United States economy. All information within the model is for the calendar year 2008 and is in 2008 dollars.

The **OHFOOD** estimates of economic activity by sector in Ohio are based on information and/or data from each of the following sources:

- US Bureau of Economic Analysis Benchmark I/O Accounts of the US
- US Bureau of Economic Analysis Output Estimates
- US Bureau of Economic Analysis REIS Program
- US Bureau of Labor Statistics ES202 Program
- US Bureau of Labor Statistics Consumer Expenditure Survey
- US Census Bureau County Business Patterns
- US Census Bureau Decennial Census and Population Surveys
- US Census Bureau Economic Censuses and Surveys
- US Department of Agriculture
- US Geological Survey

Detail of the methods of input-output modeling for an economy and the methods used for calculations of multipliers may be found in Miller and Blair. In addition, there are numerous other sources of information on the input-output modeling technique.

Basic Economic Linkages

An overview of the Ohio economy in 2008 is shown by the total output, gross state product, income and employment for each of 38 sectors, Table 4. The total economic output for Ohio in 2008 was $983.4 billion, with total employment of over 6.61 million person years. The 2008 Ohio economy generated a gross state product (GSP) of $471.5 billion, and the food and agricultural share of this GSP was $39.0 billion. This means that the food and agricultural components of the Ohio economy generate approximately $8.27 of each $100 in Ohio GSP.

The output of food and related agricultural sectors was nearly $107.5 billion, or about 11 percent of Ohio's total economy, Table 4. The $107.5 billion represents about $1 of every $9 in output for the entire Ohio economy. The total output of $107.5 billion may be divided among the five basic components of the food and related agriculture cluster, Figure 1. The largest component is processed food and processed forestry products, accounting for $51.6 billion of this output, or 48 percent of the total $107.5 billion food and agricultural output. This $51.6 billion is composed of $33.5 billion from food processing and another $18.1 billion from value added forestry processing which includes wood processing, paper, and wood furniture manufacturing. This food and forestry processing sector is significant because it accounts for about 48 cents of every $1 in output from the total food and agriculturally-related cluster.

Agricultural production adds about $9.1 billion in output or over 8 percent of the total output from the food and related agricultural cluster of the Ohio economy. The largest component within the agricultural production sector is grain production, accounting for nearly $2.5 billion in output, or nearly $1 of every $4 in output generated by the

Table 4. Ohio: Output, Gross State Product, Income, and Employment, 2008.

	Total Output	Gross State Product (GSP)	Income	Employment
	$ Millions	*$ Millions*	*$ Millions*	*Person Years*
Food & Related Agricultural Cluster				
Farm Inputs, Equip & Prof Services	**6,822.4**	**1,576.8**	**1,523.9**	**30,573**
Farming	**9,093.9**	**3,772.3**	**3,623.8**	**95,973**
Dairy Cattle & Milk Production	1,003.8	378.5	365.5	8,966
Beef Cattle Production	355.6	61.1	52.9	3,648
Poultry & Egg Production	876.6	160.5	155.7	1,903
Hogs & Other Farm Animals[a]	487.6	246.8	232.2	13,049
Grain Production	2,499.2	1,245.6	1,234.5	35,076
Soybeans & Other Oil Crops	1,867.3	890.7	838.1	20,246
Misc Crops, Hay, Sugar, Tobacco & Nuts	540.8	166.9	142.7	2,910
Fruit & Vegetable Production	334.6	170.7	165.8	2,338
Greenhouse, Nursery & Floriculture Production	405.2	240.9	237.0	4,084
Forestry, Hunting & Fishing	723.2	210.7	199.4	3,754
Processing	**51,562.8**	**11,203.9**	**10,601.2**	**127,685**
Food Processing	33,462.7	6,242.4	5,759.7	58,843
Processed Meat, Fish, Poultry & Eggs	3,702.7	461.1	456.3	9,036
Dairy Processing	6,173.4	967.0	954.3	7,249
Processed Food & Kindred Products	13,723.8	3,051.4	3,000.5	33,990
Grain Milling & Flour	653.4	68.6	67.1	501
Fats & Oils Processing	1,712.2	75.9	74.0	594
Beverage Processing	7,497.2	1,618.3	1,207.5	7,472
Wood/ Paper/ Furniture Manufacturing	18,100.0	4,961.5	4,841.4	68,843
Food & Forestry Wholesale/ Retail	**18,617.6**	**12,295.8**	**9,768.8**	**217,628**
Food Services[b]	**21,415.5**	**10,166.5**	**9,044.6**	**418,977**
Total Food & Ag Cluster	**107,512.2**	**39,015.3**	**34,562.3**	**890,836**
General Manufacturing & Service Sectors				
Mining	813.6	432.8	357.6	2,438
Stone, Clay & Glass	8,583.2	3,445.1	3,365.2	32,492
Metal Industries	65,066.9	18,194.1	17,796.4	164,438
Chemicals, Polymers & Petroleum	79,059.6	18,163.2	17,414.0	125,361
Construction	46,179.7	17,761.7	17,536.0	364,011
Textiles, Apparel/ Accessory, Yarn & Leather	2,380.3	735.6	710.9	12,085
Machinery, Equipment & General Mfg	39,243.4	13,666.5	13,254.5	134,027
Motor Vehicles, Allied Equip & Services	75,253.2	19,643.2	17,935.6	267,699
Transportation & Communication	60,645.5	26,263.7	24,602.9	264,349
Computer & Electronic Products	20,334.2	9,602.2	9,299.9	108,820
Publishing & Information Technologies	13,364.0	5,878.3	5,781.5	67,821
Wholesale & Retail Trade	68,789.0	45,430.9	36,094.1	708,449
Business, Professional & Personal Services[c]	79,823.3	47,576.1	46,504.1	823,768
Financial, Legal & Real Estate	138,060.5	86,672.0	77,570.3	574,574
Leisure Activities & Entertainment	13,755.1	6,020.8	5,444.2	164,560
Health Care & Social Assistance	72,267.0	41,763.4	41,178.9	781,018
Electricity, Gas & Sanitary Services	18,216.8	10,621.3	9,042.1	39,433
Education Services	6,315.4	3,527.0	3,472.5	126,321
Government, Military & Non-Profit	67,714.9	57,094.9	56,966.9	962,628
Other (Households & Sector Adjustment)	0.0	0.0	0.0	0
Total of Mfg & Service Sectors	**875,865.5**	**432,492.7**	**404,327.5**	**5,724,291**
2008 Total Ohio Economy	**983,377.7**	**471,508.0**	**438,889.7**	**6,615,127**

Note: The wholesaling and retailing sector is one sector in the input-output model but is disaggregated for this table. *County Business Patterns 2007* is used to estimate the percent of payroll and employment that is attributable to the food cluster.

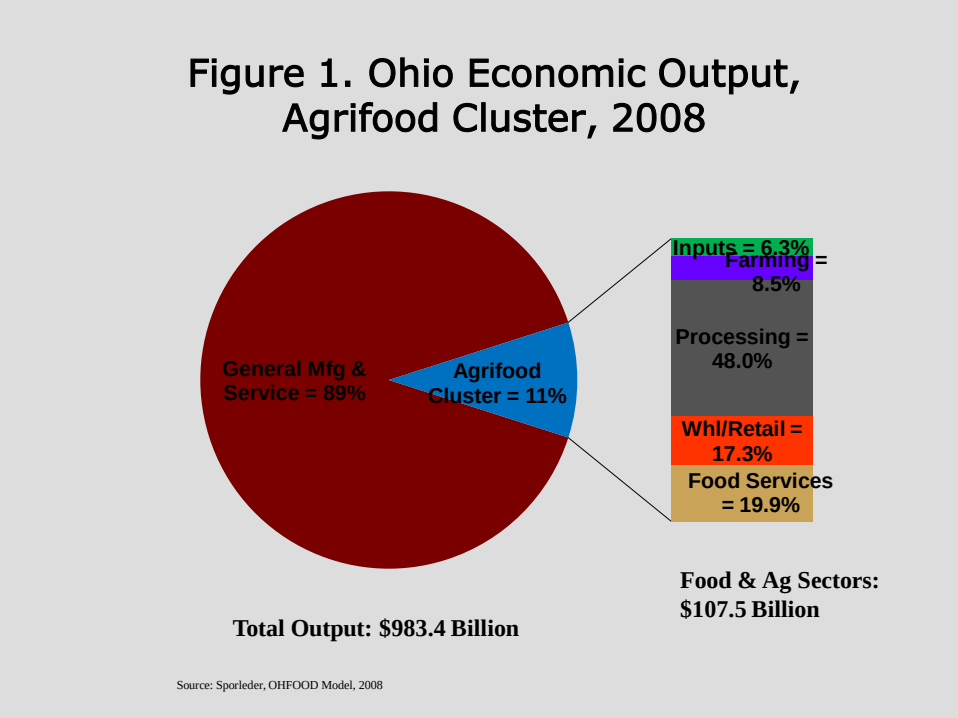
The percent of payroll (21.3) is used to estimate the proportion of food cluster output, gross national product, and income. Similarly, the percent of employment (23.5) is used to estimate the proportion of food cluster employment.

[a] Other farm animals include sheep, goats, horses, aquaculture production, and miscellaneous livestock.

[b] Excludes hotel/ motel food service.

[c] Includes diverse service items such as advertising, cleaning, barber and beauty shops, and funerals.

Source: Computed



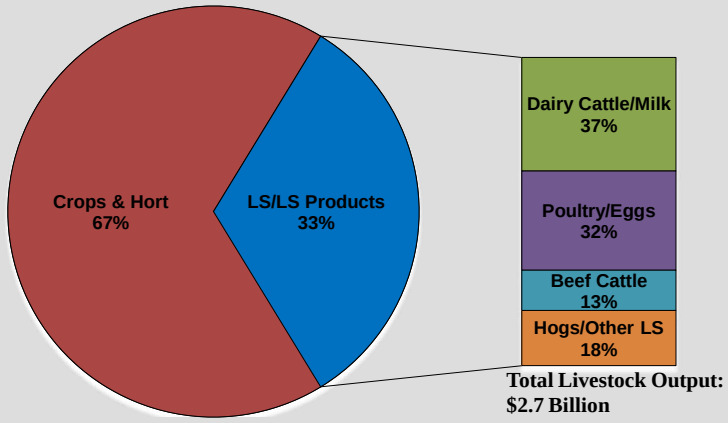
farming sector. However, oil bearing crops, primarily soybeans, account for nearly $1.9 billion in sector output.

The Ohio livestock sectors combined account for nearly $2.6 billion in output, or one-third of the $8.4 billion total agricultural production output, excluding forestry, hunting, and fishing, Figure 2. Crop and horticultural industries account for two-thirds of the total output, amounting to about $5.1 billion, Figure 3.

Gross state product is another significant measure of economic activity and is a useful measure for comparing the relative importance of various sectors. Gross state product for the total economy is similar in concept to the measure called gross domestic product (GDP) for a nation. The 2008 Ohio economy generated a gross domestic product (GSP) of $471.5 billion, and the food and agricultural share of this GSP was $39.0 billion, Table 4. This means that the food and related agricultural cluster of the Ohio economy generated approximately $8.27 of each $100 in Ohio GSP. Of the $39.0 billion gross state product contributed by the food and related agricultural cluster, about 32 percent is attributable to the food wholesaling and retailing sector while another 29 percent is attributable to food and forestry processing. These two sectors combine to contribute 61 cents of every dollar generated in gross state product from all the food and agriculturally-related sectors.

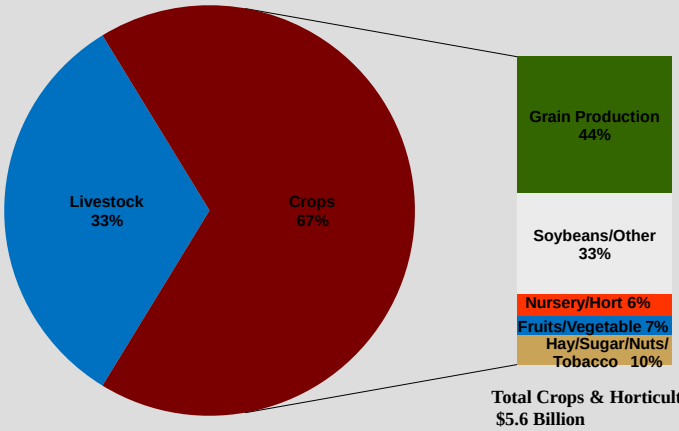
The largest of the five components of the cluster in terms of gross state product is the wholesaling and retailing of food and forestry products sector, accounting for $12.3 billion, or almost one-third of the entire gross state product by the food and related agricultural cluster combined, Figure 4. Food service accounts for another $10.2 billion in

Figure 2. Ohio Agricultural Output, Livestock Sectors, 2008

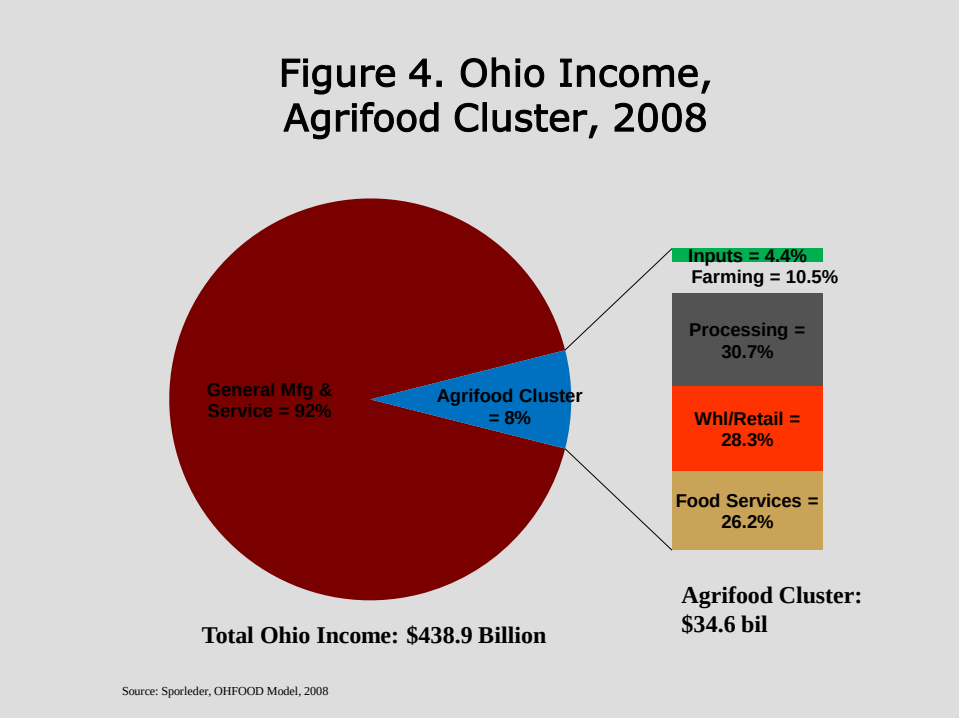


Total Livestock & Crop Output: $8.3 Billion

Figure 3. Ohio Agricultural Output, Crops & Horticulture Sectors, 2008



Total Livestock & Crop Output: $8.3 Billion

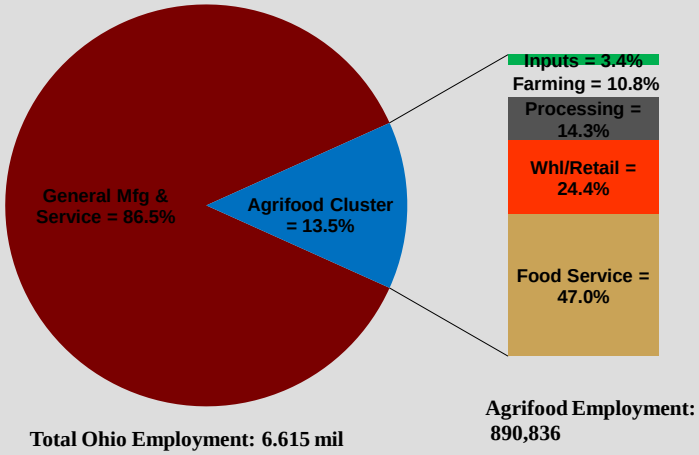


gross state product. Farm production and the farm inputs and machinery sector account for about another 9.7 percent and 4.0 percent, respectively, of the gross state product. Farm production accounts for $3.8 billion in gross state product while the farm inputs and machinery industries account for about $1.6 billion in gross state product.

The food and related agricultural component of the state's economy accounts for 890,836 person years of employment, or nearly 1 in every 7 employed in Ohio, Figure 5. The wholesaling and retailing component of the food and related agriculture cluster combined with the food service sector account for over 7 of every 10 person years of all employment in the food and agriculturally-related cluster. They combine for 636,605 jobs in total. The food and value added forestry processing sectors account for over 127 thousand jobs, or just over 14 percent of the total food and related agricultural cluster employment. Farm production accounts for nearly 96 thousand jobs or about 11 of every 100 persons employed in the entire food and related agricultural cluster. The smallest sector in terms of employment within the food and related agricultural cluster is farm inputs and machinery, yet this sector employs 30,573, Table 4.

The food and related agricultural cluster accounts for $34.6 billion in income or 7.9 percent of total income in the entire state's economy, Figure 6. The food and forestry product processing sector accounts for about $10.6 billion of a total food and related agricultural cluster income of $34.6 billion, or roughly 31 percent of the cluster's income. Food and forestry wholesaling and retailing income accounts for another $9.8 billion in total cluster income, with another $9.0 billion in income added by the food service sector. Ohio farm production income was over $3.6 billion for 2008, Table 1.

Figure 5. Ohio Employment, Agrifood Cluster, 2008

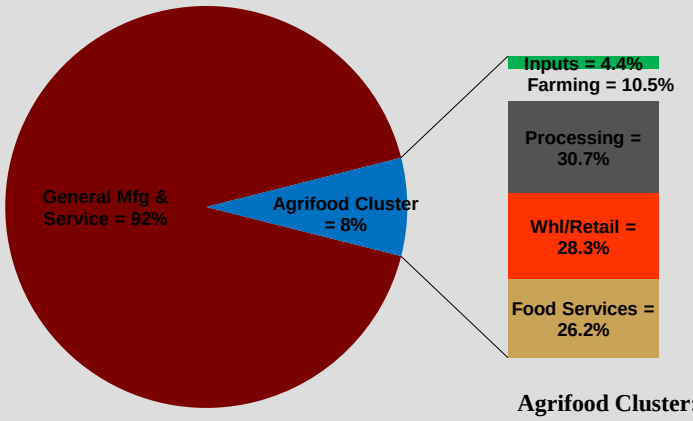


Total Ohio Employment: 6.615 mil

Agrifood Employment: 890,836

Source: Sporleder, OHFOOD Model, 2008

Figure 6. Ohio Income, Agrifood Cluster, 2008



Total Ohio Income: $438.9 Billion

Agrifood Cluster: $34.6 bil

Source: Sporleder, OHFOOD Model, 2008

Ohio livestock sectors combined account for $806.3 million in income, or nearly one-fourth of the over $3.4 billion total farming income exclusive of wood and forestry. Beef and dairy cattle along with milk production account for $418.4 million in income in the farming sector. Poultry and egg production accounts for $155.7 million in total income from the livestock sector. Hogs and miscellaneous livestock account for $232.2 million. Table 4.

ECONOMIC IMPACT OF VETERINARY MEDICINE ON OHIO'S ECONOMY

Direct and Indirect Effects: Economic Multipliers

The input-output model provides the basis for the estimation of the direct economic impact of veterinary medicine on Ohio's economy. Combining the direct influence with the appropriate estimated multiplier provides as estimate of the direct, indirect, and induced influence on the economy from the veterinary medicine profession. While the influence of veterinary medicine can be measured in several ways, economists define economic multipliers as a means of capturing the 'ripple' effect of economic activity on the total economy.

Input-output models are driven by final consumption or final demand. Industries respond to meet demands directly or indirectly (by supplying goods and services to industries responding directly). Each industry that produces goods and services generates demands for other goods and services. These other producers, in turn, purchase goods and services. These "indirect" purchases (indirect effects) continue until "leakage" from the region (such as imports, wages, or profits) stop the cycle.

Multipliers capture these iterations. An output multiplier for a sector, for example, measures the additional value of production from all sectors of the economy when expansion or contraction of output occurs within a sector by the entrance or exit of firms in a geographic location. Output multipliers can be the basis for analyzing the importance of each industry in terms of its overall influence on the economy. Other types of multipliers include income and employment. An income multiplier is a measure of the intuitive notion that income earned by one individual or industry is spent and becomes income to a second individual or industry. In turn, the second individual spends a portion of that income so that it becomes income to yet another individual. The income multiplier relates an increment in the income of one sector to an increment of income among all other sectors. Thus, the multiplier is a metric estimating how the increase in income in one sector induces the income of another sector to increase. Employment multipliers are derived from output multipliers simply by converting from an output to employment base.

The Type II economic multiplier is a metric that captures the direct effects plus the indirect effects plus the induced effects. The estimation of the economic influence on Ohio's economy from veterinary medicine relies on these Type II multipliers. These multipliers were estimated for each sector of the OHFOOD model, Table 5.

Table 5. Ohio Economic Multipliers for Output, GSP, Income, and Employment, 2008, by Sector

	Output	Gross State Product	Income	Employment
Food & Related Agricultural Cluster				
Farm Inputs, Equipment & Prof Services	1.7836	2.7184	2.3802	2.2589
Farming				
Dairy Cattle/Milk Production	1.5069	1.6241	3.4248	1.3679
Beef Cattle	1.6098	2.6484	3.0787	1.4356
Poultry & Egg Production	1.6521	2.5330	2.4655	2.9157
Hogs & Other Farm Animals[a]	1.4615	1.4471	1.9507	1.1376
Grain Production	1.5002	1.4981	2.9455	1.2232
Nursery & Horticulture Production	1.5104	1.5431	3.0837	1.3034
Fruit & Vegetable Production	1.6922	2.1100	2.3765	1.8112
Soybeans & Other Oil Crops	1.6314	1.6147	1.7463	1.6042
Misc. Crops/Hay/Sugar/Tobacco/Nut	1.6669	1.5987	1.4467	1.4893
Forestry, Hunting & Fishing	1.6530	2.0372	2.1126	1.8701
Food and Forestry Processing				
Food Processing				
Processed Meat, Fish, Poultry & Eggs	1.7114	3.6088	2.6327	3.4879
Dairy Processing	1.8443	3.4013	3.1044	5.8665
Processed Food & Kindred Products	1.6830	2.5484	2.5432	2.9595
Grain Milling & Flour	1.7839	5.1007	4.9280	N.A.
Fats & Oils	1.5953	N.A..	6.2866	N.A.
Beverage Processing	1.7230	2.5659	3.6331	5.4315
Wood, Paper, Wood Furniture Mfg.	1.7170	2.3486	2.0609	2.3450
Food & Forestry Wholesale/Retail	1.7389	1.6378	1.6367	1.5486
Food Service[b]	1.8063	1.9163	1.7848	1.3007
General Manufacturing & Service Sectors				
Mining	1.7114	1.5804	1.6483	2.3343
Stone, Clay & Glass	1.8443	2.0023	1.9504	2.4145
Metal Industries	1.6830	2.3250	2.2340	2.9387
Chemicals, Polymers & Petroleum	1.7839	2.1150	2.1854	3.0722
Construction	1.5953	2.1705	1.7674	1.7971
Textiles, Apparel, Accessories, Yarn & Leath	1.7230	2.0478	1.8596	1.8857
Machinery, Equipment & General Mfg	1.7170	2.0649	2.0028	2.4817
Motor Vehicles, Allied Equip & Services	1.7389	2.5366	2.1697	2.5423
Transportation & Communication	1.8063	1.9832	2.0052	2.3263
Computer & Electronic Products	1.8746	2.0288	1.6567	2.2679
Publishing & Information Industries	1.8508	2.0701	1.9773	2.2908
Wholesale & Retail Trade	1.7389	1.6378	1.6367	1.5486
Business & Personal Services[c]	1.8634	1.8144	1.6262	1.6183
Financial, Legal & Real Estate	1.6452	1.5964	1.9445	1.8073
Leisure Activities & Entertainment	1.8545	2.0818	1.9235	1.6639
Health Care & Social Assistance	1.9210	1.9060	1.6498	1.6038
Electricity, Gas & Sanitary	1.4461	1.4014	1.6629	2.2961
Education Services	1.9246	1.9300	1.5680	1.3090
Government, Military & Non Profit	1.7943	1.5316	1.3417	1.5229

Notes: N.A.= not applicable. The wholesaling and retailing sector is one sector in the input-output model so multipliers are the same for both food and general W/R

a Other farm animals include sheep, goats, horses, aquaculture production, & miscellaneous livestock.

b Excludes hotel/motel food service.

c Includes diverse service items such as advertising, cleaning, barber and beauty shops, and funerals.

Source: Computed

The output multiplier for veterinary medicine is estimated at 1.7836. The interpretation of this multipliers is that for each increase (or decrease) of $1,000,000 in output from veterinary medicine sector in Ohio, a total output change in the economy is $1,783,600. Similarly, the GSP multiplier is estimated at 2.7184. This means that for each increase (or decrease) in GSP from the veterinary medicine sector in Ohio, a total change in Ohio's gross state product will change by $2,718,400. The employment multiplier is estimated at 2.2589. This means that for each increase (or decrease) of 1 job in the veterinary medicine sector in Ohio, a total change in Ohio's employment will be 2.26 person years in employment. These various economic multipliers capture the substantial economic influence that veterinary medicine has on the state's overall economy.

Total Economic Impact of Veterinary Medicine

The economic impact of veterinary medicine is $1.96 billion on Ohio. This is the amount of output added to the Ohio economy from veterinary medicine in 2008, considering the direct, indirect, and induced effects of the sector. The direct economic output is estimated as $1.1 billion.

In terms of jobs, the total influence of veterinary medicine is an additional 33,383 in Ohio. This is based on the direct employment estimation in the sector from the input-output model of 14,778. Considering the ripple effect captured by the employment multiplier, the total impact of veterinary medicine on employment in Ohio is 33,383 for 2008.

Moreover, veterinary medicine contributes a total of nearly $1.4 billion to Ohio's gross state product. The direct estimation of GSP for the veterinary medicine sector is $503.6 million. The GSP multiplier is 2.7184 for a total effect on GSP in Ohio of $1.4 billion.

SPATIAL ANALYSIS OF VETERINARY MEDICINE IN OHIO

Evaluating county level data related to the veterinary medical profession within Ohio provides an indication of the spatial aspects of the profession. In general, the location of veterinarians is influenced by where animal population densities are relatively large. Also, analyzing which geographic areas may be underserved can be better understood by using benchmarking (ratio analysis by county).

A basic classification of population density is to classify counties as either urban or rural. Metropolitan areas would have greater population densities and would accordingly be classified as urban. Sparsely populated counties, outside the influence of major metropolitan areas, would be classified as rural. This helps in understanding the nature of the population densities in Ohio.

The classification of counties is provided by the Economic Research Service (ERS) of the United States Department of Agriculture (USDA). ERS designed a sophisticated system of classification of each county within the U.S. that measures its relative urban or

rural character. Figure 7 provides an Ohio county map depicting the classification of counties on a continuum of rural to urban. The rural counties are tan while the urban counties are blue. Mixed counties are ones where some portions of the county are urban but others are rural. Such counties are green and called 'mixed' counties.

Figure 7. Ohio Counties Classified by Rural (White), Urban (Dark Green), or Mixed (Light Green).

Source: ERS, USDA

The spatial distribution of private practice veterinarians using the classification of counties in Figure 7 provides some useful insights. Of the total 2,284 private practice veterinarians, there were 1,598 in private practice in urban counties, or nearly 3 or every 4. It is expected that since m a majority of practicing veterinarians are in companion animal practices that these veterinarians would be located in urban areas where the primary population of companion animals are located.

At-Risk Food Animal Populations

The number of food animals in Ohio is significant. The latest Census of Agriculture indicates a total of nearly 2.6 million farm animals in Ohio, Table 6. These animals are not contribute to the human food supply but produce valuable products, such as milk and wool, that add to their already significant economic importance as food animals. The veterinary medicine professionals in Ohio ultimately maintain the health of these animals, thereby assuring ultimately a safer and more abundant food supply. The geographic distribution of these food animals is provided in Appendix A-2. This appendix has the number of livestock for selected species by Ohio county.

Table 6. Ohio Food Animals, by Type, 2007

Food Animals	Number of Head (1,000)
Dairy Cattle	271.9
Beef Cattle	293.8
Hogs	1,831.1
Goats	69.5
Sheep	123.2
TOTAL	2,589.5

Source: U.S. Department of Agriculture, Census of Agriculture, 2007

Distribution of Food Animal Veterinarians in Ohio

The distribution of food animal veterinarians relative to the food animal population in Ohio reveals the extent of the food animal population compared to the practicing food animal veterinarians. For purposes of examining the distribution of food animal veterinarians, the ratio of food animals to practicing food animal veterinarians was calculated for each county in Ohio, Table 7. The animal population is the total for food animals in each county. The number of practicing food animal veterinarians was approximated from data provided by OVMA and AVMA.

The results indicate that the mean ratio is about 24,000 food animals per food animal veterinarian across all counties in Ohio. This ranges from relatively low numbers of animals per veterinarian in urban counties to higher ratios in the rural counties that are more sparsely populated. The maximum ratio across all Ohio counties is 178,752 food animals per veterinarian. This ratio is for Mercer County. Generally, the ratio for food animals per food animal veterinarian increases for those counties characterized as rural. This is what is expected in terms of the geographic distribution of food animal veterinarians.

Table 7. Food Animals Veterinarians Relative to Food Animals, Ohio, by County,

County	Total Food Animals	Total Food Animal Veterinarians	Animals per Veterinarian
Adams	32,135	0	N.A.
Allen	70,645	0	N.A.
Ashland	41,511	2	20,756
Ashtabula	19,760	2	9,880
Athens	9,392	0	N.A.
Auglaize	112,755	2	56,378
Belmont	21,483	0	N.A.
Brown	22,384	0	N.A.
Butler	23,123	2	11,562
Carroll	24,268	2	12,134
Champaign	34,978	0	N.A.
Clark	33,523	0	N.A.
Clermont	5,686	4	1,422
Clinton	23,571	0	N.A.
Columbiana	34,408	4	8,602
Coshocton	56,151	4	14,038
Crawford	69,306	0	N.A.
Cuyahoga	103	12	9
Darke	263,422	2	131,711
Defiance	22,173	0	N.A.
Delaware	40,222	2	20,111
Erie	3,323	2	1,662
Fairfield	31,867	2	15,934
Fayette	8,811	2	4,406
Franklin	4,723	11	429
Fulton	69,027	6	11,505
Gallia	19,579	0	N.A.
Geauga	9,445	4	2,361
Greene	27,503	0	N.A.
Guernsey	30,444	0	N.A.
Hamilton	1,374	10	137
Hancock	37,710	0	N.A.
Hardin	71,878	0	N.A.
Harrison	16,408	0	N.A.
Henry	16,498	0	N.A.
Highland	35,406	2	17,703
Hocking	3,084	0	N.A.
Holmes	64,321	0	N.A.
Huron	23,337	4	5,834
Jackson	11,876	0	N.A.
Jefferson	10,816	0	N.A.
Knox	44,204	4	11,051
Lake	788	4	197
Lawrence	6,521	0	N.A.

N.A. - Total veterinarians in this county is zero

Source: USDA, Census of Agriculture, National Agricultural Statistical Service, Washington, D.C., 2007, AVMA, and OVMA

County	Total Food Animals	Total Food Animal Veterinarians	Animals per Veterinarian
Licking	51,385	2	25,693
Logan	29,456	4	7,364
Lorain	18,317	4	4,579
Lucas	5,144	6	857
Madison	34,895	2	17,448
Mahoning	14,786	0	N.A.
Marion	56,425	2	28,213
Medina	11,522	4	2,881
Meigs	10,381	0	N.A.
Mercer	355,504	6	59,251
Miami	24,509	0	N.A.
Monroe	13,893	0	N.A.
Montgomery	17,828	4	4,457
Morgan	19,076	0	N.A.
Morrow	45,297	0	N.A.
Muskingum	54,620	2	27,310
Noble	13,463	0	N.A.
Ottawa	5,497	2	2,749
Paulding	25,237	0	N.A.
Perry	18,036	0	N.A.
Pickaway	38,592	2	19,296
Pike	7,979	0	N.A.
Portage	9,138	2	4,569
Preble	64,368	4	16,092
Putnam	91,966	2	45,983
Richland	41,154	2	20,577
Ross	17,378	0	N.A.
Sandusky	10,968	2	5,484
Scioto	10,029	0	N.A.
Seneca	55,674	1	55,674
Shelby	104,382	0	N.A.
Stark	34,277	8	4,285
Summit	1,297	6	216
Trumbull	12,432	8	1,554
Tuscarawas	45,687	2	22,844
Union	44,503	0	N.A.
Van Wert	32,859	0	N.A.
Vinton	3,079	0	N.A.
Warren	5,443	6	907
Washington	20,761	2	10,381
Wayne	146,757	8	18,345
Williams	34,177	0	N.A.
Wood	11,489	5	2,298
Wyandot	44,093	0	N.A.

N.A. - Total veterinarians in this county is zero

Source: USDA, Census of Agriculture, National Agricultural Statistical Service, Washington, D.C., 2007, AVMA, and OVMA

Companion Animals in Ohio

As a part of the study, the number of companion animals was calculated by county, in addition to the food animals population by county provided above. The calculation of companion animals (dogs, cats, birds, and horses) was based on the number of companion animals per household from a national study (AVMA). They provide a population factor per household. When multiplied by the number of households, an estimate of the number of companion animals is obtained. The number of companion animals by Ohio county is provided in Appendix A-2. There were a total of 7,650,289 companion animals in Ohio. There were 3,210 thousand dogs and 3,621 thousand cats. The total number of birds in Ohio is estimated at 497,828 and the total number of horses at 320,032 for 2008.

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Appendix A-1

OHFOOD SECTOR DEFINITIONS

Using North American Industry Classification System (NAICS)

Appendix Table A-1. Concordance between the OHFOOD Sectors and the North American Industrial Classification System (NAICS), Data Year 2008.

OHFOOD Sector	NAICS
FARM INPUTS, EQUIP. & PROF SERVICES	11500, 21239, 311119, 325311, 325311, 325312, 325313, 32532, 32741, 541940, 333111, 333112
Dairy Cattle & Milk Production	112120
Beef Cattle Production	112112
Poultry & Egg Production	112310
Hogs & Other Farm Animals	11220,11240, 11250, 11290
Grain Production	11113, 11114, 11115, 11116, 11119
Soybeans & Other Oil Crops	11111, 11112
Miscellaneous Crops, and Hay, Sugar, Tobacco, and Nut Crops	111335, 11191-11193, 111991, 11194, 111992, 111998
Fruit and Vegetable Production	11120, 11131, 11132, 11133
Greenhouse, Nursery and Floriculture Production	11140
Forestry, Hunting & Fishing	1133,11310, 11320, 11330, 11410, 11420
Processed Meat, Fish, Poultry & Eggs	31170, 311611, 311612, 311613, 311615
Dairy Processing	311511, 311512, 311513, 311514, 31152
Processed Food and Kindred Products	31123, 31132, 31133, 31134, 31141,31183, 31199, 311111, 311213, 311311, 311312, 311313, 311420, 311811, 311812, 311813, 311821, 311822, 311823, 311911, 311919, 311941, 311942

Grain Milling & Flour	311211, 311212, 311221
Fats & Oils Processing	311222, 311223, 311225
Beverage Processing	31192, 31193, 31211, 31212, 31213, 31214
Wood / Paper/ Wood Furniture Manufacturing	32211, 32212, 32213, 32221, 33711, 321113, 321114,32192 321192, 321211, 321212, 321213, 321214, 321219, 321911, 321912, 321918, 321999, 322221, 322222, 322223, 322224, 322226, 322231, 322232, 322233, 322291, 322299, 337121, 337122, 337127, 337211, 337212, 337214,
Food Services	72200
Mining	21210, 21221, 21222, 21223, 21229
Stone, Clay & Glass	21231, 21232, 32730, 32732, 32739, 32791, 327111, 327112, 327113, 327121, 327122, 327123, 327124, 327125, 327211, 327212, 327213, 327215, 327331, 327332, 327991, 327992, 327993, 327999
Metal Industries	331111, 331112, 33121, 331221, 331222, 331311, 331312, 331314 331315, 331316, 331319, 331411, 331419, 331421, 331422, 331423 331491, 331492, 33151, 331521, 331524, 331522, 331525, 331528 332111, 332112, 332114, 332115, 332116. 332117. 332211. 332214. 332212. 332213. 332311. 332312. 332313. 332321. 332322. 332323. 33241. 33242. 33243. 33250. 33260. 33271. 33272. 332811. 332812. 332813. 332911-2, 332919. 332913. 332991. 332994. 332995. 332996. 332997. 332997. 332998. 32999. 332992. 332993. 337124. 337125
Chemicals, Polymers & Petroleum	21100. 213111. 213112. 213113. 213114. 213115. 32411. 324121. 324122. 324191. 324199. 32511. 32513. 325181. 325182. 325188. 32519. 325211. 325212. 324221. 325222. 32551. 32552. 325611. 325612. 325613. 32562. 32592. 325991. 325992. 325998. 32611. 326121. 326122. 32613. 32616. 326192. 326191. 326199. 32614. 32615. 32621. 32622. 32629. 33322

Construction	23000
Textiles, Apparel, Accessories, Yarn & Leather	31310. 31321. 31322. 31323. 31324. 31331. 31332. 31411. 31412. 31491. 314991. 314992. 315211. 315111. 315119. 31519. 31520. 31522. 31523. 31529. 31590. 31610. 31620. 31690. 33791, 33792, 33991
Machinery, Equipment & General Mfg	33312. 333131. 333132. 33321. 333291-4. 333298. 333295. 333314. 333315. 333319. 333311. 333312. 333313. 333411. 333412. 333414. 333415. 333511. 333512. 333513. 333514. 333515. 333516. 333518. 333611. 333612. 333613. 333618 333911. 333913. 333912. 333921. 333922. 333923. 333924 333991. 333992. 333997. 333999. 333993. 333994. 333995 333996. 335110. 33512. 335211. 335212. 335221. 335222. 335224 335228. 335311. 335312. 335313. 335314. 335911. 335912 335921. 335929. 33593. 335991. 335999. 337215. 33995. 339991. 339992. 339995. 339994. 81120. 81130
Motor Vehicles, Allied Equip & Services	336111. 336112. 33612. 336211. 336212. 336213. 336214 33630. 336214. 81111. 81112. 811191. 811198. 811192
Transportation and Communication	336411. 336412. 336413. 336414. 336415. 335419. 33650 336611. 336612. 336991. 336999. 48100. 48200. 48300. 48400, 48500, 49200
Computer & Electronic Products	334111. 334112. 334113. 334119. 33421. 33422. 33429. 33430. 334411. 334413. 334412. 334414. 334415. 334416 334414-6. 334418. 334417. 334419. 334510. 334511. 334512 334513. 334514. 334515. 334516. 334517. 334518. 334519. 334611. 334612. 334613. 541511. 541512. 541513. 541519
Publishing & Information Technologies	323111-323119. 323121. 323122. 32591. 51111. 51112. 51113 51114. 51119. 51120. 51913. 517. 518. 51911-2

Wholesale and Retail Trade	42000. 49300. 44100. 44200. 44300. 44400. 44500. 44600. 44700 44800. 45100. 45200. 45300. 45400
Business, Professional & Personal Services	33994. 53240. 53222. 54130. 54140. 54161. 54162. 54170. 54180 54192. 54191. 54193. 54199. 55000. 56110. 56120. 56130. 56140 56160. 56170. 56190. 81140. 81210. 81220. 81230. 81290
Financial, Legal & Real Estate	52220. 52230. 52300. 52410. 52420. 52500. 52100. 52210. 53100 53300. 54110. 54120
Leisure Activities & Entertainment	33992. 33993. 48700. 48800. 51210. 51220. 5151. 5152. 53223 56150. 71110. 71120. 71150. 71130. 71140. 71200. 71394. 71395 71310. 71320. 71391. 71392. 71393. 71399. 72111. 72112. 72119 72120. 72130
Health Care & Social Assistance	325411. 325412. 325413. 325414. 339111. 339113. 339112. 339114. 339115. 339116. 62160. 62110. 62120. 62130. 62140. 62150. 62190. 62200. 62300. 62440. 62410. 62420. 62430
Electrical, Natural Gas and Sanitary Services	22110. 22130. 22120. 32512. 48600. 56200
Education Services	61110. 61120. 61130. 61140. 61150. 61160. 61170
Government, Military & Non-Profit	336992. 491110. 81310. 81320. 81330. 81340. 81390

Appendix A-2

NUMBER OF LIVESTOCK, SELECTED SPECIES, OHIO, BY COUNTY, 2007

AND

NUMBER OF COMPANION ANIMALS (DOGS, CATS, BIRDS, AND HORSES), OHIO, BY COUNTY, 2008

OHIO, CATTLE INVENTORY, BEEF AND DAIRY, BY COUNTY 2007

COUNTY	NUMBER OF HEAD	COUNTY	NUMBER OF HEAD
ADAMS	26,535	LICKING	23,993
ALLEN	6,915	LOGAN	9,739
ASHLAND	23,346	LORAIN	11,995
ASHTABULA	18,574	LUCAS	621
ATHENS	7,858	MADISON	10,364
AUGLAIZE	20,055	MAHONING	12,937
BELMONT	20,450	MARION	6,696
BROWN	20,175	MEDINA	9,783
BUTLER	15,771	MEIGS	10,040
CARROLL	17,053	MERCER	79,058
CHAMPAIGN	9,696	MIAMI	11,685
CLARK	19,800	MONROE	12,401
CLERMONT	5,253	MONTGOMERY	9,552
CLINTON	3,914	MORGAN	13,803
COLUMBIANA	30,385	MORROW	10,019
COSHOCTON	27,181	MUSKINGUM	29,180
CRAWFORD	8,003	NOBLE	11,577
CUYAHOGA	39	OTTAWA	1,523
DARKE	36,595	PAULDING	7,538
DEFIANCE	10,678	PERRY	9,723
DELAWARE	3,502	PICKAWAY	8,824
ERIE	2,519	PIKE	6,984
FAIRFIELD	14,144	PORTAGE	7,971
FAYETTE	4,396	PREBLE	16,133
FRANKLIN	1,632	PUTNAM	13,949
FULTON	31,513	RICHLAND	20,677
GALLIA	17,831	ROSS	14,463
GEAUGA	7,711	SANDUSKY	4,612
GREENE	4,434	SCIOTO	9,490
GUERNSEY	21,873	SENECA	10,096
HAMILTON	1,294	SHELBY	27,498
HANCOCK	4,233	STARK	26,824
HARDIN	15,185	SUMMIT	1,199
HARRISON	11,334	TRUMBULL	11,711
HENRY	6,230	TUSCARAWAS	34,937
HIGHLAND	19,454	UNION	8,644
HOCKING	2,473	VAN WERT	6,518
HOLMES	54,480	VINTON	2,736
HURON	7,992	WARREN	3,730
JACKSON	11,369	WASHINGTON	18,449
JEFFERSON	10,305	WAYNE	90,212
KNOX	18,872	WILLIAMS	16,827
LAKE	547	WOOD	6,287
LAWRENCE	6,221	WYANDOT	3,584

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, BEEF CATTLE, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD	COUNTY	NUMBER OF HEAD
ADAMS	13,018	LICKING	6,198
ALLEN	924	LOGAN	2,238
ASHLAND	3,122	LORAIN	796
ASHTABULA	2,330	LUCAS	206
ATHENS	3,729	MADISON	2,173
AUGLAIZE	1,242	MAHONING	1,589
BELMONT	11,231	MARION	861
BROWN	10,333	MEDINA	1,543
BUTLER	4,486	MEIGS	4,058
CARROLL	5,741	MERCER	2,091
CHAMPAIGN	3,281	MIAMI	1,877
CLARK	2,221	MONROE	5,928
CLERMONT	3,172	MONTGOMERY	2,150
CLINTON	1,864	MORGAN	7,103
COLUMBIANA	4,826	MORROW	2,387
COSHOCTON	8,368	MUSKINGUM	13,051
CRAWFORD	844	NOBLE	6,764
CUYAHOGA	(D)	OTTAWA	343
DARKE	2,004	PAULDING	566
DEFIANCE	395	PERRY	4,896
DELAWARE	872	PICKAWAY	2,382
ERIE	718	PIKE	3,938
FAIRFIELD	4,402	PORTAGE	2,216
FAYETTE	1,507	PREBLE	2,748
FRANKLIN	404	PUTNAM	828
FULTON	1,126	RICHLAND	3,327
GALLIA	10,280	ROSS	7,597
GEAUGA	1,132	SANDUSKY	932
GREENE	2,097	SCIOTO	(D)
GUERNSEY	11,080	SENECA	1,603
HAMILTON	458	SHELBY	1,741
HANCOCK	650	STARK	3,707
HARDIN	1,608	SUMMIT	(D)
HARRISON	5,718	TRUMBULL	2,147
HENRY	353	TUSCARAWAS	5,496
HIGHLAND	8,537	UNION	1,322
HOCKING	1,549	VAN WERT	357
HOLMES	6,029	VINTON	(D)
HURON	950	WARREN	1,934
JACKSON	5,774	WASHINGTON	7,406
JEFFERSON	4,433	WAYNE	5,036
KNOX	5,714	WILLIAMS	1,076
LAKE	241	WOOD	666
LAWRENCE	3,496	WYANDOT	517

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, DARIY CATTLE, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	3,221
ALLEN	682
ASHLAND	6,280
ASHTABULA	6,768
ATHENS	1,114
AUGLAIZE	5,377
BELMONT	935
BROWN	851
BUTLER	1,444
CARROLL	3,693
CHAMPAIGN	1,950
CLARK	2,443
CLERMONT	229
CLINTON	137
COLUMBIANA	9,836
COSHOCTON	3,917
CRAWFORD	1,362
CUYAHOGA	-
DARKE	8,222
DEFIANCE	3,982
DELAWARE	368
ERIE	519
FAIRFIELD	1,064
FAYETTE	355
FRANKLIN	349
FULTON	3,239
GALLIA	603
GEAUGA	3,081
GREENE	219
GUERNSEY	1,601
HAMILTON	288
HANCOCK	1,244
HARDIN	2,248
HARRISON	829
HENRY	1,895
HIGHLAND	1,319
HOCKING	-
HOLMES	17,515
HURON	2,055
JACKSON	319
JEFFERSON	1,819
KNOX	3,664
LAKE	-
LAWRENCE	250

COUNTY	NUMBER OF HEAD
LICKING	3,628
LOGAN	2,435
LORAIN	4,789
LUCAS	-
MADISON	2,969
MAHONING	5,386
MARION	3,450
MEDINA	2,848
MEIGS	2,118
MERCER	21,515
MIAMI	1,492
MONROE	1,476
MONTGOMERY	570
MORGAN	1,175
MORROW	1,730
MUSKINGUM	1,646
NOBLE	228
OTTAWA	275
PAULDING	4,908
PERRY	487
PICKAWAY	1,407
PIKE	400
PORTAGE	1,834
PREBLE	1,715
PUTNAM	4,690
RICHLAND	6,360
ROSS	1,152
SANDUSKY	799
SCIOTO	-
SENECA	750
SHELBY	7,006
STARK	9,732
SUMMIT	-
TRUMBULL	3,015
TUSCARAWAS	10,484
UNION	1,264
VAN WERT	3,375
VINTON	-
WARREN	136
WASHINGTON	2,506
WAYNE	33,681
WILLIAMS	7,596
WOOD	1,830
WYANDOT	1,467

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, HOGS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	4,774
ALLEN	62,910
ASHLAND	15,316
ASHTABULA	574
ATHENS	397
AUGLAIZE	91,925
BELMONT	90
BROWN	1,685
BUTLER	6,482
CARROLL	5,479
CHAMPAIGN	23,779
CLARK	12,805
CLERMONT	231
CLINTON	18,376
COLUMBIANA	2,203
COSHOCTON	26,898
CRAWFORD	60,512
CUYAHOGA	(D)
DARKE	225,171
DEFIANCE	10,891
DELAWARE	35,587
ERIE	239
FAIRFIELD	16,501
FAYETTE	2,385
FRANKLIN	2,135
FULTON	36,390
GALLIA	465
GEAUGA	493
GREENE	21,744
GUERNSEY	6,504
HAMILTON	24
HANCOCK	32,343
HARDIN	55,545
HARRISON	363
HENRY	10,153
HIGHLAND	12,415
HOCKING	(D)
HOLMES	5,781
HURON	14,056
JACKSON	115
JEFFERSON	(D)
KNOX	13,744
LAKE	49
LAWRENCE	111
LICKING	22,901
LOGAN	17,940
LORAIN	5,417
LUCAS	4,268
MADISON	23,530
MAHONING	1,222
MARION	47,002
MEDINA	781
MEIGS	190
MERCER	273,762
MIAMI	10,429
MONROE	338
MONTGOMERY	7,679
MORGAN	4,164
MORROW	32,030
MUSKINGUM	20,964
NOBLE	148
OTTAWA	3,639
PAULDING	17,477
PERRY	7,366
PICKAWAY	29,111
PIKE	868
PORTAGE	524
PREBLE	47,049
PUTNAM	77,003
RICHLAND	19,213
ROSS	1,699
SANDUSKY	5,591
SCIOTO	299
SENECA	42,808
SHELBY	75,499
STARK	5,871
SUMMIT	(D)
TRUMBULL	553
TUSCARAWAS	8,842
UNION	34,602
VAN WERT	25,344
VINTON	136
WARREN	942
WASHINGTON	1,249
WAYNE	51,920
WILLIAMS	16,123
WOOD	4,530
WYANDOT	39,469

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, LAYERS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	1,829
ALLEN	452
ASHLAND	69,349
ASHTABULA	3,783
ATHENS	2,113
AUGLAIZE	670,918
BELMONT	1,438
BROWN	1,917
BUTLER	1,138
CARROLL	1,527
CHAMPAIGN	2,256
CLARK	1,666
CLERMONT	2,523
CLINTON	1,110
COLUMBIANA	2,955
COSHOCTON	102,524
CRAWFORD	-
CUYAHOGA	868
DARKE	8,381,549
DEFIANCE	484
DELAWARE	1,600
ERIE	836
FAIRFIELD	3,492
FAYETTE	496
FRANKLIN	1,349
FULTON	780
GALLIA	1,953
GEAUGA	4,833
GREENE	1,405
GUERNSEY	1,815
HAMILTON	532
HANCOCK	-
HARDIN	-
HARRISON	960
HENRY	782
HIGHLAND	1,715
HOCKING	1,140
HOLMES	226,945
HURON	42,280
JACKSON	990
JEFFERSON	507
KNOX	3,327
LAKE	1,046
LAWRENCE	1,468
LICKING	-
LOGAN	1,090
LORAIN	2,874
LUCAS	565
MADISON	960
MAHONING	2,925
MARION	571
MEDINA	5,354
MEIGS	8,891
MERCER	8,013,436
MIAMI	7,932
MONROE	1,057
MONTGOMERY	2,019
MORGAN	1,495
MORROW	22,331
MUSKINGUM	2,506
NOBLE	1,107
OTTAWA	615
PAULDING	639
PERRY	1,331
PICKAWAY	1,048
PIKE	1,120
PORTAGE	2,189
PREBLE	7,506
PUTNAM	194,332
RICHLAND	77,495
ROSS	1,420
SANDUSKY	942
SCIOTO	-
SENECA	3,735
SHELBY	-
STARK	4,081
SUMMIT	3,262
TRUMBULL	2,460
TUSCARAWAS	7,058
UNION	1,340
VAN WERT	-
VINTON	444
WARREN	1,750
WASHINGTON	1,481
WAYNE	729,880
WILLIAMS	-
WOOD	-
WYANDOT	-

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, BROILERS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	696
ALLEN	560
ASHLAND	0
ASHTABULA	1,726
ATHENS	0
AUGLAIZE	0
BELMONT	107
BROWN	487
BUTLER	345
CARROLL	1,478
CHAMPAIGN	721
CLARK	360
CLERMONT	176
CLINTON	218
COLUMBIANA	287,728
COSHOCTON	406,001
CRAWFORD	210
CUYAHOGA	0
DARKE	1,963
DEFIANCE	63
DELAWARE	410
ERIE	1,592
FAIRFIELD	1,300
FAYETTE	0
FRANKLIN	275
FULTON	0
GALLIA	366
GEAUGA	2,331
GREENE	106
GUERNSEY	514
HAMILTON	0
HANCOCK	0
HARDIN	1,477
HARRISON	0
HENRY	385
HIGHLAND	200
HOCKING	146
HOLMES	2,504,477
HURON	244,702
JACKSON	273
JEFFERSON	102
KNOX	875
LAKE	0
LAWRENCE	9
LICKING	480
LOGAN	325
LORAIN	1,474
LUCAS	285
MADISON	230
MAHONING	522,805
MARION	180
MEDINA	1,065
MEIGS	0
MERCER	0
MIAMI	350
MONROE	10
MONTGOMERY	885
MORGAN	0
MORROW	789
MUSKINGUM	0
NOBLE	51
OTTAWA	105
PAULDING	0
PERRY	147
PICKAWAY	60
PIKE	0
PORTAGE	822
PREBLE	1,287
PUTNAM	0
RICHLAND	107,731
ROSS	145
SANDUSKY	0
SCIOTO	0
SENECA	370
SHELBY	296
STARK	4,332,847
SUMMIT	323
TRUMBULL	1,749
TUSCARAWAS	569,765
UNION	631
VAN WERT	0
VINTON	0
WARREN	720
WASHINGTON	216
WAYNE	688,721
WILLIAMS	338
WOOD	270
WYANDOT	0

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, TURKEYS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	15
ALLEN	57
ASHLAND	82
ASHTABULA	56
ATHENS	20
AUGLAIZE	(D)
BELMONT	(D)
BROWN	97
BUTLER	17
CARROLL	44
CHAMPAIGN	68
CLARK	102
CLERMONT	44
CLINTON	24
COLUMBIANA	68
COSHOCTON	114
CRAWFORD	(D)
CUYAHOGA	22
DARKE	625,979
DEFIANCE	55
DELAWARE	33
ERIE	32
FAIRFIELD	51
FAYETTE	-
FRANKLIN	75
FULTON	9
GALLIA	21
GEAUGA	197
GREENE	18
GUERNSEY	26
HAMILTON	(D)
HANCOCK	-
HARDIN	14
HARRISON	(D)
HENRY	(D)
HIGHLAND	7
HOCKING	(D)
HOLMES	(D)
HURON	23
JACKSON	8
JEFFERSON	(D)
KNOX	(D)
LAKE	110
LAWRENCE	23

COUNTY	NUMBER OF HEAD
LICKING	32
LOGAN	40
LORAIN	131
LUCAS	39
MADISON	(D)
MAHONING	186
MARION	19
MEDINA	645
MEIGS	(D)
MERCER	1,236,645
MIAMI	18
MONROE	29
MONTGOMERY	89
MORGAN	(D)
MORROW	145
MUSKINGUM	50
NOBLE	(D)
OTTAWA	(D)
PAULDING	(D)
PERRY	25
PICKAWAY	19
PIKE	79
PORTAGE	(D)
PREBLE	(D)
PUTNAM	(D)
RICHLAND	109
ROSS	31
SANDUSKY	20
SCIOTO	11
SENECA	9
SHELBY	88
STARK	159
SUMMIT	78
TRUMBULL	344
TUSCARAWAS	131
UNION	(D)
VAN WERT	19
VINTON	13
WARREN	187
WASHINGTON	63
WAYNE	401
WILLIAMS	77
WOOD	8
WYANDOT	-

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, GOATS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	683
ALLEN	190
ASHLAND	519
ASHTABULA	129
ATHENS	213
AUGLAIZE	244
BELMONT	574
BROWN	440
BUTLER	435
CARROLL	340
CHAMPAIGN	960
CLARK	427
CLERMONT	204
CLINTON	435
COLUMBIANA	395
COSHOCTON	832
CRAWFORD	307
CUYAHOGA	(D)
DARKE	452
DEFIANCE	129
DELAWARE	201
ERIE	15
FAIRFIELD	538
FAYETTE	283
FRANKLIN	62
FULTON	196
GALLIA	673
GEAUGA	287
GREENE	114
GUERNSEY	575
HAMILTON	59
HANCOCK	183
HARDIN	73
HARRISON	389
HENRY	47
HIGHLAND	1,047
HOCKING	664
HOLMES	602
HURON	131
JACKSON	246
JEFFERSON	201
KNOX	1,243
LAKE	76
LAWRENCE	516

COUNTY	NUMBER OF HEAD
LICKING	484
LOGAN	283
LORAIN	428
LUCAS	58
MADISON	(D)
MAHONING	115
MARION	91
MEDINA	769
MEIGS	152
MERCER	317
MIAMI	391
MONROE	809
MONTGOMERY	152
MORGAN	379
MORROW	362
MUSKINGUM	293
NOBLE	239
OTTAWA	81
PAULDING	132
PERRY	237
PICKAWAY	517
PIKE	187
PORTAGE	273
PREBLE	380
PUTNAM	220
RICHLAND	114
ROSS	373
SANDUSKY	75
SCIOTO	198
SENECA	341
SHELBY	194
STARK	180
SUMMIT	76
TRUMBULL	247
TUSCARAWAS	548
UNION	175
VAN WERT	58
VINTON	295
WARREN	108
WASHINGTON	180
WAYNE	427
WILLIAMS	342
WOOD	264
WYANDOT	110

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, SHEEP, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	826
ALLEN	820
ASHLAND	2,849
ASHTABULA	612
ATHENS	1,137
AUGLAIZE	775
BELMONT	943
BROWN	524
BUTLER	870
CARROLL	1,736
CHAMPAIGN	1,503
CLARK	918
CLERMONT	202
CLINTON	1,281
COLUMBIANA	1,820
COSHOCTON	2,072
CRAWFORD	791
CUYAHOGA	64
DARKE	1,656
DEFIANCE	604
DELAWARE	1,133
ERIE	565
FAIRFIELD	1,222
FAYETTE	2,030
FRANKLIN	956
FULTON	1,124
GALLIA	1,283
GEAUGA	1,241
GREENE	1,325
GUERNSEY	2,067
HAMILTON	56
HANCOCK	1,134
HARDIN	1,148
HARRISON	4,711
HENRY	115
HIGHLAND	3,537
HOCKING	611
HOLMES	4,060
HURON	1,289
JACKSON	392
JEFFERSON	511
KNOX	11,588
LAKE	192
LAWRENCE	189
LICKING	4,491
LOGAN	1,777
LORAIN	905
LUCAS	255
MADISON	1,001
MAHONING	627
MARION	2,727
MEDINA	958
MEIGS	151
MERCER	2,684
MIAMI	2,395
MONROE	1,154
MONTGOMERY	597
MORGAN	1,109
MORROW	3,248
MUSKINGUM	4,476
NOBLE	1,738
OTTAWA	335
PAULDING	222
PERRY	947
PICKAWAY	657
PIKE	127
PORTAGE	643
PREBLE	1,186
PUTNAM	1,014
RICHLAND	1,264
ROSS	1,216
SANDUSKY	765
SCIOTO	240
SENECA	2,770
SHELBY	1,385
STARK	1,582
SUMMIT	98
TRUMBULL	168
TUSCARAWAS	1,908
UNION	1,257
VAN WERT	997
VINTON	207
WARREN	771
WASHINGTON	1,063
WAYNE	4,625
WILLIAMS	1,227
WOOD	672
WYANDOT	1,040

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, ALPACAS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	(D)
ALLEN	68
ASHLAND	157
ASHTABULA	361
ATHENS	(D)
AUGLAIZE	(D)
BELMONT	(D)
BUTLER	50
CARROLL	145
CHAMPAIGN	168
CLARK	236
CLERMONT	163
CLINTON	(D)
COLUMBIANA	48
COSHOCTON	23
CRAWFORD	36
CUYAHOGA	147
DARKE	54
DEFIANCE	(D)
DELAWARE	176
ERIE	204
FAIRFIELD	90
FAYETTE	57
FRANKLIN	499
FULTON	(D)
GALLIA	(D)
GEAUGA	895
GREENE	137
GUERNSEY	60
HAMILTON	(D)
HANCOCK	661
HARDIN	(D)
HIGHLAND	(D)
HOCKING	(D)
HOLMES	45
HURON	113
JACKSON	50
JEFFERSON	(D)
KNOX	76
LAKE	158
LICKING	202
LOGAN	78
LORAIN	283
LUCAS	27
MADISON	68
MAHONING	75
MARION	132
MEDINA	840
MIAMI	25
MONROE	67
MONTGOMERY	(D)
MORROW	24
MUSKINGUM	(D)
NOBLE	(D)
OTTAWA	24
PAULDING	30
PERRY	(D)
PICKAWAY	80
PORTAGE	524
PREBLE	36
PUTNAM	(D)
RICHLAND	204
ROSS	(D)
SANDUSKY	(D)
SCIOTO	(D)
SENECA	-
SHELBY	140
STARK	299
SUMMIT	524
TRUMBULL	373
TUSCARAWAS	42
UNION	87
VAN WERT	(D)
WARREN	637
WASHINGTON	118
WAYNE	225
WILLIAMS	27
WOOD	120

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, LLAMAS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	10
ALLEN	52
ASHLAND	52
ASHTABULA	98
ATHENS	4
AUGLAIZE	(D)
BELMONT	13
BROWN	28
BUTLER	70
CARROLL	44
CHAMPAIGN	20
CLARK	57
CLERMONT	14
CLINTON	40
COLUMBIANA	61
COSHOCTON	296
CUYAHOGA	9
DARKE	22
DELAWARE	67
ERIE	(D)
FAIRFIELD	205
FAYETTE	10
FRANKLIN	43
FULTON	66
GALLIA	15
GEAUGA	24
GREENE	173
GUERNSEY	123
HAMILTON	11
HANCOCK	41
HARDIN	(D)
HARRISON	17
HENRY	(D)
HIGHLAND	40
HOCKING	11
HOLMES	65
HURON	69
JACKSON	6
JEFFERSON	10
KNOX	270
LAKE	4
LAWRENCE	26

COUNTY	NUMBER OF HEAD
LICKING	84
LOGAN	52
LORAIN	26
LUCAS	(D)
MADISON	(D)
MAHONING	163
MARION	13
MEDINA	139
MEIGS	(D)
MIAMI	89
MONROE	24
MONTGOMERY	49
MORGAN	19
MORROW	68
MUSKINGUM	197
NOBLE	(D)
OTTAWA	8
PAULDING	9
PERRY	82
PICKAWAY	23
PIKE	(D)
PORTAGE	74
PREBLE	71
RICHLAND	18
ROSS	(D)
SANDUSKY	(D)
SCIOTO	81
SENECA	12
SHELBY	10
STARK	189
SUMMIT	54
TRUMBULL	44
TUSCARAWAS	100
UNION	236
VAN WERT	(D)
WARREN	134
WASHINGTON	100
WAYNE	60
WILLIAMS	16
WOOD	47
WYANDOT	24

Source: USDA, *Census of Agriculture* , National Agricultural Statistical Service, Washington, D.C., 2007.

OHIO, DOGS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	7,578
ALLEN	28,672
ASHLAND	13,949
ASHTABULA	28,841
ATHENS	15,937
AUGLAIZE	12,369
BELMONT	19,772
BROWN	12,491
BUTLER	91,160
CARROLL	8,220
CHAMPAIGN	10,654
CLARK	39,386
CLERMONT	49,383
CLINTON	11,418
COLUMBIANA	29,585
COSHOCTON	10,178
CRAWFORD	13,073
CUYAHOGA	392,141
DARKE	14,116
DEFIANCE	10,708
DELAWARE	39,528
ERIE	23,740
FAIRFIELD	35,623
FAYETTE	8,049
FRANKLIN	331,863
FULTON	10,913
GALLIA	8,395
GEAUGA	22,478
GREENE	42,228
GUERNSEY	12,359
HAMILTON	243,033
HANCOCK	21,719
HARDIN	8,316
HARRISON	4,872
HENRY	7,765
HIGHLAND	11,583
HOCKING	7,899
HOLMES	7,984
HURON	15,731
JACKSON	9,268
JEFFERSON	21,159
KNOX	15,308
LAKE	62,666
LAWRENCE	17,231
LICKING	41,860
LOGAN	14,644
LORAIN	78,139
LUCAS	128,811
MADISON	9,789
MAHONING	72,114
MARION	17,623
MEDINA	42,446
MEIGS	6,821
MERCER	10,613
MIAMI	26,725
MONROE	4,546
MONTGOMERY	161,150
MORGAN	5,082
MORROW	8,375
MUSKINGUM	22,411
NOBLE	3,573
OTTAWA	17,245
PAULDING	5,564
PERRY	8,957
PICKAWAY	12,502
PIKE	7,817
PORTAGE	41,396
PREBLE	11,389
PUTNAM	8,542
RICHLAND	34,743
ROSS	19,040
SANDUSKY	16,488
SCIOTO	21,901
SENECA	15,386
SHELBY	12,742
STARK	104,192
SUMMIT	153,865
TRUMBULL	61,316
TUSCARAWAS	24,599
UNION	11,921
VAN WERT	8,050
VINTON	3,585
WARREN	48,629
WASHINGTON	17,640
WAYNE	29,013
WILLIAMS	10,753
WOOD	33,007
WYANDOT	6,132

Source: AVMA, *U.S. Pet Ownership* , 2007 U.S. Pet Ownership & Demographic Sourcebook.

OHIO, CATS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	8,549
ALLEN	32,347
ASHLAND	15,737
ASHTABULA	32,537
ATHENS	17,979
AUGLAIZE	13,954
BELMONT	22,306
BROWN	14,092
BUTLER	102,844
CARROLL	9,274
CHAMPAIGN	12,020
CLARK	44,434
CLERMONT	55,712
CLINTON	12,881
COLUMBIANA	33,377
COSHOCTON	11,482
CRAWFORD	14,748
CUYAHOGA	442,400
DARKE	15,925
DEFIANCE	12,080
DELAWARE	44,595
ERIE	26,782
FAIRFIELD	40,189
FAYETTE	9,080
FRANKLIN	374,396
FULTON	12,311
GALLIA	9,471
GEAUGA	25,359
GREENE	47,641
GUERNSEY	13,943
HAMILTON	274,181
HANCOCK	24,502
HARDIN	9,382
HARRISON	5,497
HENRY	8,760
HIGHLAND	13,068
HOCKING	8,911
HOLMES	9,007
HURON	17,747
JACKSON	10,456
JEFFERSON	23,871
KNOX	17,270
LAKE	70,698
LAWRENCE	19,440
LICKING	47,225
LOGAN	16,521
LORAIN	88,154
LUCAS	145,320
MADISON	11,044
MAHONING	81,357
MARION	19,882
MEDINA	47,887
MEIGS	7,695
MERCER	11,973
MIAMI	30,150
MONROE	5,129
MONTGOMERY	181,804
MORGAN	5,733
MORROW	9,449
MUSKINGUM	25,283
NOBLE	4,031
OTTAWA	19,456
PAULDING	6,277
PERRY	10,105
PICKAWAY	14,105
PIKE	8,818
PORTAGE	46,702
PREBLE	12,849
PUTNAM	9,637
RICHLAND	39,196
ROSS	21,481
SANDUSKY	18,601
SCIOTO	24,708
SENECA	17,358
SHELBY	14,375
STARK	117,546
SUMMIT	173,586
TRUMBULL	69,175
TUSCARAWAS	27,751
UNION	13,449
VAN WERT	9,082
VINTON	4,045
WARREN	54,861
WASHINGTON	19,901
WAYNE	32,732
WILLIAMS	12,131
WOOD	37,237
WYANDOT	6,918

Source: AVMA, *U.S. Pet Ownership* , 2007 U.S. Pet Ownership & Demographic Sourcebook.

OHIO, BIRDS, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD
ADAMS	1,175
ALLEN	4,446
ASHLAND	2,163
ASHTABULA	4,472
ATHENS	2,471
AUGLAIZE	1,918
BELMONT	3,066
BROWN	1,937
BUTLER	14,136
CARROLL	1,275
CHAMPAIGN	1,652
CLARK	6,107
CLERMONT	7,658
CLINTON	1,770
COLUMBIANA	4,588
COSHOCTON	1,578
CRAWFORD	2,027
CUYAHOGA	60,807
DARKE	2,189
DEFIANCE	1,660
DELAWARE	6,129
ERIE	3,681
FAIRFIELD	5,524
FAYETTE	1,248
FRANKLIN	51,460
FULTON	1,692
GALLIA	1,302
GEAUGA	3,485
GREENE	6,548
GUERNSEY	1,916
HAMILTON	37,686
HANCOCK	3,368
HARDIN	1,289
HARRISON	755
HENRY	1,204
HIGHLAND	1,796
HOCKING	1,225
HOLMES	1,238
HURON	2,439
JACKSON	1,437
JEFFERSON	3,281
KNOX	2,374
LAKE	9,717
LAWRENCE	2,672
LICKING	6,491
LOGAN	2,271
LORAIN	12,117
LUCAS	19,974
MADISON	1,518
MAHONING	11,182
MARION	2,733
MEDINA	6,582
MEIGS	1,058
MERCER	1,646
MIAMI	4,144
MONROE	705
MONTGOMERY	24,988
MORGAN	788
MORROW	1,299
MUSKINGUM	3,475
NOBLE	554
OTTAWA	2,674
PAULDING	863
PERRY	1,389
PICKAWAY	1,939
PIKE	1,212
PORTAGE	6,419
PREBLE	1,766
PUTNAM	1,325
RICHLAND	5,387
ROSS	2,952
SANDUSKY	2,557
SCIOTO	3,396
SENECA	2,386
SHELBY	1,976
STARK	16,156
SUMMIT	23,859
TRUMBULL	9,508
TUSCARAWAS	3,814
UNION	1,849
VAN WERT	1,248
VINTON	556
WARREN	7,541
WASHINGTON	2,735
WAYNE	4,499
WILLIAMS	1,667
WOOD	5,118
WYANDOT	951

Source: AVMA, *U.S. Pet Ownership* , 2007 U.S. Pet Ownership & Demographic Sourcebook.

OHIO, HORSES, BY COUNTY, 2007

COUNTY	NUMBER OF HEAD	COUNTY	NUMBER OF HEAD
ADAMS	755	LICKING	4,173
ALLEN	2,858	LOGAN	1,460
ASHLAND	1,390	LORAIN	7,789
ASHTABULA	2,875	LUCAS	12,840
ATHENS	1,589	MADISON	976
AUGLAIZE	1,233	MAHONING	7,189
BELMONT	1,971	MARION	1,757
BROWN	1,245	MEDINA	4,231
BUTLER	9,087	MEIGS	680
CARROLL	819	MERCER	1,058
CHAMPAIGN	1,062	MIAMI	2,664
CLARK	3,926	MONROE	453
CLERMONT	4,923	MONTGOMERY	16,064
CLINTON	1,138	MORGAN	507
COLUMBIANA	2,949	MORROW	835
COSHOCTON	1,015	MUSKINGUM	2,234
CRAWFORD	1,303	NOBLE	356
CUYAHOGA	39,090	OTTAWA	1,719
DARKE	1,407	PAULDING	555
DEFIANCE	1,067	PERRY	893
DELAWARE	3,940	PICKAWAY	1,246
ERIE	2,366	PIKE	779
FAIRFIELD	3,551	PORTAGE	4,127
FAYETTE	802	PREBLE	1,135
FRANKLIN	33,081	PUTNAM	852
FULTON	1,088	RICHLAND	3,463
GALLIA	837	ROSS	1,898
GEAUGA	2,241	SANDUSKY	1,644
GREENE	4,209	SCIOTO	2,183
GUERNSEY	1,232	SENECA	1,534
HAMILTON	24,226	SHELBY	1,270
HANCOCK	2,165	STARK	10,386
HARDIN	829	SUMMIT	15,338
HARRISON	486	TRUMBULL	6,112
HENRY	774	TUSCARAWAS	2,452
HIGHLAND	1,155	UNION	1,188
HOCKING	787	VAN WERT	802
HOLMES	796	VINTON	357
HURON	1,568	WARREN	4,847
JACKSON	924	WASHINGTON	1,758
JEFFERSON	2,109	WAYNE	2,892
KNOX	1,526	WILLIAMS	1,072
LAKE	6,247	WOOD	3,290
LAWRENCE	1,718	WYANDOT	611

Source: AVMA, *U.S. Pet Ownership* , 2007 U.S. Pet Ownership & Demographic Sourcebook.