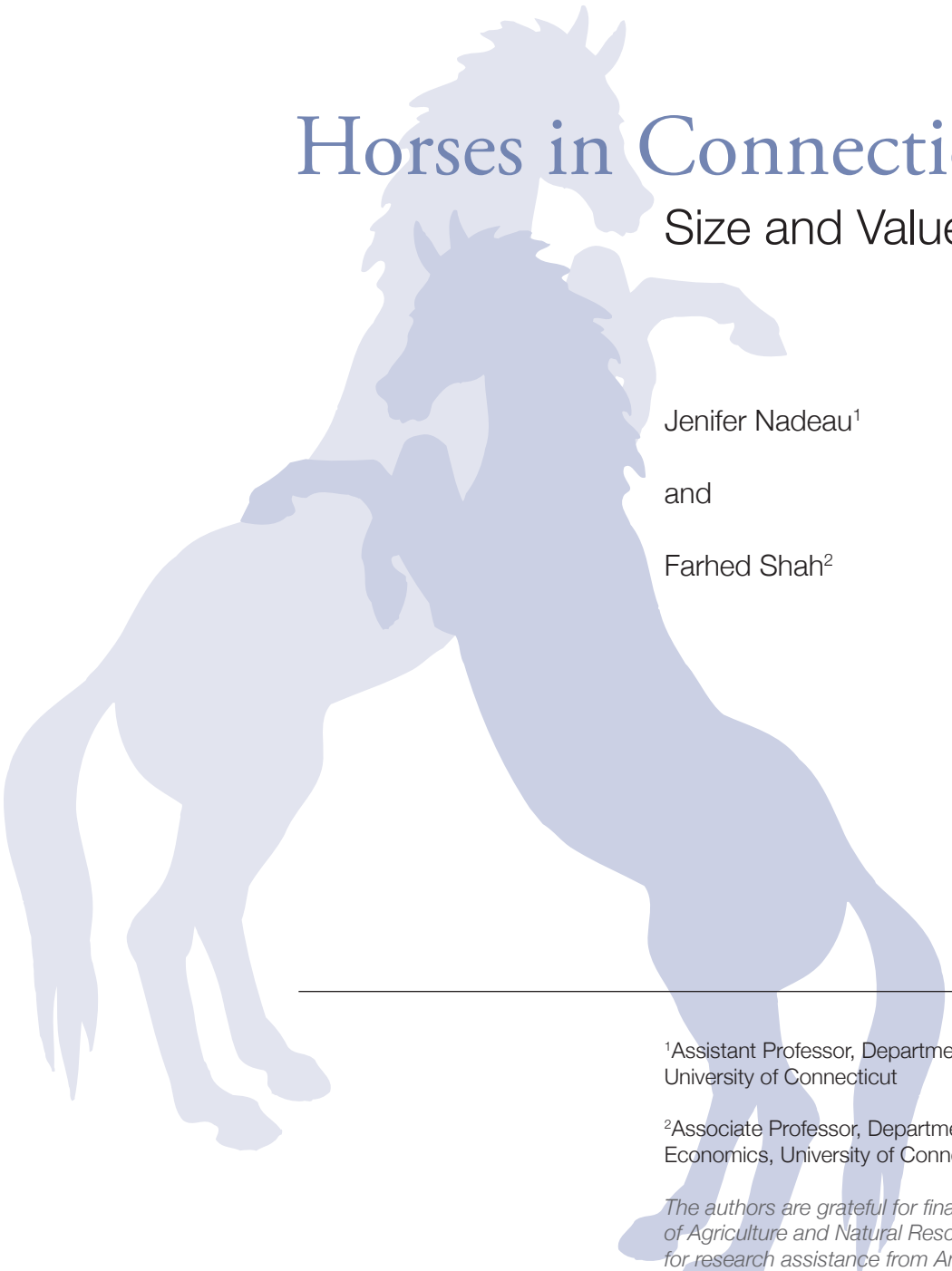
HORSES *in Connecticut*

Size and Value of the Industry

University of Connecticut
College of Agriculture and Natural Resources

University of Connecticut



Horses in Connecticut

Size and Value of the Industry

Jenifer Nadeau[1]

and

Farhed Shah[2]

---

[1]Assistant Professor, Department of Animal Science, University of Connecticut

[2]Associate Professor, Department of Agricultural and Resource Economics, University of Connecticut

The authors are grateful for financial support provided by the College of Agriculture and Natural Resources, University of Connecticut and for research assistance from Anita Chaudhry (Graduate Student, Department of Economics, University of Wyoming), Emmanuel Genio (Graduate Student, Department of Agricultural and Resource Economics, University of Connecticut), and Jose Maripani (Graduate Student, Department of Agricultural and Resource Economics, University of Connecticut and Assistant Professor, Department of Business and Economics, University of Magallanes-Chile).

I. Introduction

Horses were an integral part of daily life in the early history of Connecticut through their use in the building of roads, clearing of land, and provision of transportation. Today, horses continue to play an important role in the lives of Connecticut residents in the form of leisure pursuits and related business activities. Relative to its size and population, Connecticut is purported to have a large horse industry that is also making significant contributions to the economy, but formal documentation of such speculations has been lacking. This report summarizes the results of the first study to quantify the size of the state's horse industry and analyze its various demographic and economic characteristics.[1]

The report is organized as follows. Section II provides a brief review of the existing horse industry research, focusing on a recent American Horse Council Foundation study. Section III describes the procedure we used to determine the size of Connecticut's horse population and discusses the results. Section IV presents the demographic characteristics of horse ownership and use in Connecticut including environmental, health, and safety impacts. Section V reports on the findings of the horse-related businesses survey. Section VI draws inferences from several different dimensions of the data collected and discusses the economic and statistical implications. Concluding remarks are offered in Section VII.

[1] *For a more detailed discussion, see Nadeau, Shah, Chaudhry, and Maripani (2006)*

II. Review of Existing Research and Methodology

Sure to be the most widely cited study of horse count and economic impact-related information is the one commissioned by the American Horse Council Foundation (Deloitte, 2005). Major findings of this study are:

- The national number of horses is estimated at 9.2 million.
- The nationwide economic impact of the U.S. horse industry in terms of direct, indirect, and induced spending to the U.S. economy is $102 billion annually.
- The horse industry sustains approximately 1.4 million full time equivalent jobs annually, with over 460,000 created from direct spending within the industry.
- About 1.96 million people own horses, with another 2 million involved as volunteers or through a family affiliation.
- The median income of horse-owning families is about $60,000. Horse ownership is broad based across income classes with 34 percent of the industry under $50,000 of income and 28% over $100,000.

The main advantage of this data source is that it provides one of the few national estimates of the horse population and includes additional detail for 15 states (which do not, however, include any of the New England States). A major technical limitation of the study is that the procedure used for enumeration of horses is based on available horse owner lists. In many cases these may be incomplete to an unknown degree, making it difficult to specify a margin of error.[2] Consequently, inferences drawn from this incomplete information may also be questioned.

[2] For example, the reported estimate for horses in Connecticut seems to be based on quite arbitrary adjustments to data from available mailing lists, making us skeptical of its validity. The same comment applies to estimates reported for several other states.

While bearing in mind the above limitations, some interesting observations can be made with respect to Connecticut. According to the study, Connecticut ranks 41st nationally in terms of number of horses and is estimated to have a higher population of horses (51,968) than any other New England state. Also, Connecticut ranks 3rd in the density of horses nationwide (calculated by taking estimated number of horses and dividing by area of the state in square miles) and has the greatest density of horses in New England. Finally, Connecticut ranks 43rd in horses per capita. Vermont and Maine are the only two New England states that place above Connecticut in number of horses per capita.

There exist several statewide studies very similar to Deloitte (2005) in approach and methodology. Agricultural statistics services, universities, other governmental agencies and private companies have carried out such studies of the industry. These studies used different methods to gather data: telephone surveys, online surveys, personal interviews, mailed surveys, and area frame sampling (Beattie et al. 2001, Delaware Agricultural Statistics Service and Delaware Department of Agriculture 2004, Department of Animal and Dairy Sciences Pennsylvania State University 2003, Greene et. al 2002, University of New Hampshire Survey Center 2003).

A common theme of these studies is that they provide information on the size of horse populations and on the use and type of horses. These studies indicate that the horse industry is of substantial economic value (hundreds of millions of dollars per state). Due to the substantial cost of surveys and economic impact studies, most states have performed them infrequently, but they are still valuable as sources of information.

A fundamental limitation that is shared by these existing studies is that they use owner surveys to enumerate horses. As argued above, the margin of error with this methodology is difficult to determine and is likely to be large in many cases. Fear of taxation, fear of misuse of information, and perceived invasion of privacy are additional reasons that incorrect, incomplete, or no information may be provided by respondents of the survey. Moreover, despite having detailed data on horse breeds and ownership, these studies do not attempt to separate out the effects of breed, age, sex, etc. on the determination of the market value of horses. In other words, very little systematic attempt at economic analysis of the horse industry is to be found in the existing literature.

III. Size of Connecticut's Horse Population

In order to arrive at a reasonable estimate of horses in Connecticut, we decided to target their service providers rather than relying on lists of horse owners obtained from horse-related clubs and organizations. We chose to survey veterinarians because of the ease of compiling a fairly complete mailing list of this service provider and because all horses need to be vaccinated at least once a year. Moreover, we felt that veterinarians would tend to have more detailed and updated records of their clients than other service providers.

A list of veterinarians in Connecticut was compiled using rosters of various horse clubs and organizations, the equine extension specialist's database, Just Horses Directory, and, most importantly, the Connecticut Veterinary Medical Association. The survey was pre-tested and then sent to all veterinarians (including non-horse veterinarians).

A total of 149 veterinary surveys were mailed out and 79 (53 percent) were received with full information. The veterinarians were asked if they treated horses, the number of horses they treated overall, and the number from within Connecticut in 2002. Out of the 79 respondents, 42 treated horses (53 percent). Moreover, 30 percent of these 42 veterinarians treated horses exclusively while the rest treated other animals as well. The 42 veterinarians together treated 27,396 horses overall and 21,764 horses only in Connecticut during 2002. Interviews with selected veterinarians suggest that typically there is substantial customer loyalty and no more than one-third of the horse owner clients could be consulting with other veterinarians in the same year.

Based on available data and reasonable assumptions, Connecticut veterinarians treated 79.44% of Connecticut horses and the remaining 20.56% were treated out-of-state, resulting in an estimate of 51,671 horses in Connecticut if no horses are double counted. On the other hand, if one-third of the horses are doubled counted, the number of horses in Connecticut is 34,447. The mid-point of this range is 43,059 horses.

It should be noted this figure is substantially higher than the total number of horses that could be obtained from extrapolation of our owner survey data (i.e., approximately 3,000 horses). This is to be expected given the incomplete nature of our horse owner mailing lists. There is no obvious way to have been able to predict such a large margin of error, which makes us skeptical of research that uses horse-owner mailing lists for enumeration of horses.

Figure 4-1: Age of Owners

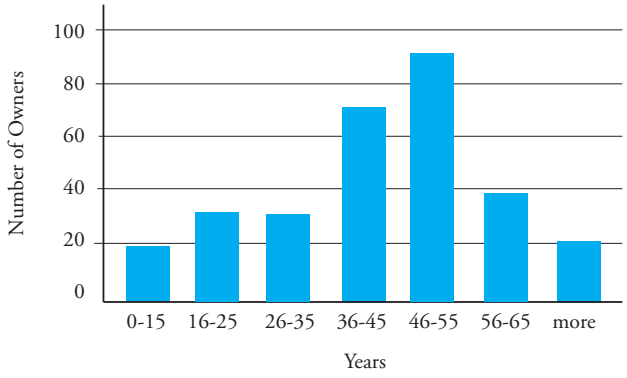
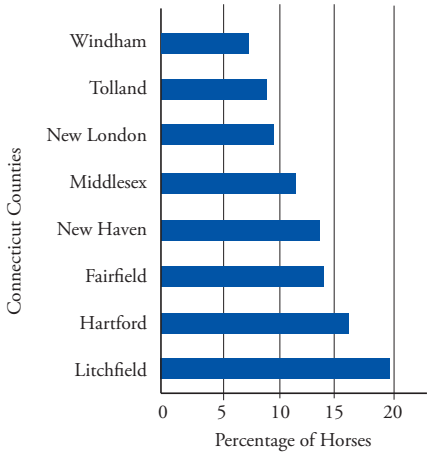


Figure 4-2: Geographical Distribution of Horses in Connecticut



IV. Demographic Characteristics of Horse Ownership and Use in Connecticut

IV.1 Overview and Data Collection Procedures

The objectives of the horse owner survey were to obtain information related to broad characteristics of horse ownership and to investigate the types, values, and uses of horses owned by Connecticut households. The survey was pre-tested.

A total of 1,061 owner surveys were mailed out and 366 (34.5%) of these were completed. Of the people surveyed, 83% owned at least one horse at the time and were able to respond to the subsequent questions in the survey.

IV.2 Horse Owner Profile

The survey results indicate that Connecticut's horse owning population has the following general characteristics.

(1) Most of the horse owning population has individual ownership (71.6%) – as opposed to joint or business ownership.

(2) The vast majority of horse owners (88%) are females.

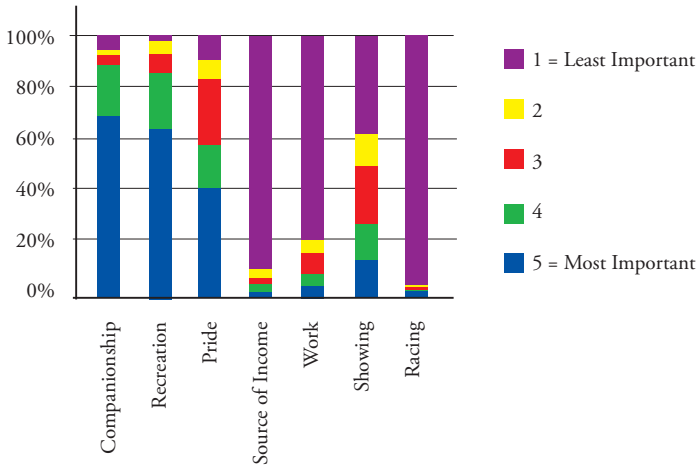
(3) The age distribution of horse owners is reported in Figure 4-1. The average age of the horse owner is about 45 years.

(4) The average length of time a person had owned a horse was 18.61 years.

(5) The predominant primary occupation of horse owners could be classified as "professional" (since "Manager/Engineer/Scientist/Teacher" and "Secretary/Assistant" categories account for 64.2% of respondents).

(6) Figure 4-2 shows the geographical location of horses in Connecticut based on our sample. There is no direct relationship between horse numbers and human population density. Litchfield, with the highest number of horses, is the most rural of all Connecticut counties with a population density of 198 persons per square mile (U.S. Census Bureau, 2000). On the other hand, Windham is the next most rural county after Litchfield (with a population density of 213 persons per square mile), yet it is has the least number of horses in our sample.

Figure 4-3: Reasons for Owning a Horse



The most common uses of horses in our sample are companionship and recreation.

(7) Horse ownership in Connecticut is best described as a personal recreational activity. Respondents were asked to rate the reasons for owning a horse on a scale of 1 (least important) to 5 (most important). Respondents could choose more than one response. Figure 4-3 summarizes the results. The first bar corresponds to companionship. About 71% rated this as the most important reason for owning a horse, while 18% considered it the second most important reason. Similarly, the second bar shows that personal and family use and recreation is considered most important by 67%.

(8) The most common uses of horses in our sample are companionship (71%) and recreation (67%). Many other states in the U.S. display a similar pattern. Also, the national averages reported in the 2005 American Horse Council study are consistent with these results.

(9) The average annual household income of our respondents is about $100,000. The largest income group is that of $50,000 - $74,999 (22% of horse owners) and the majority are in the income range 50,000-99,999 (50% of horse owners). Note that average annual income per household in Connecticut is approximately $61,000, which suggests that horse ownership in Connecticut is associated with middle to higher incomes.

(10) The average number of horses per owner is 2. Horses appear to be owned primarily by households with 2 people, while the average number of people living in the household is 2.89.

IV.3 Horse Types and Use Characteristics

Respondents were asked for the sex and age of their horse(s), use characteristics (including manure handling and helmet use), and market value of horse-related assets. Results are summarized below.

(1) Geldings (54%) and mares (43%) account for most of the horses in our sample. The average age of horses owned was 14, with most horses ranging in age from 6 to 18.

(2) Over half (53%) of horse owners in Connecticut do not board their horses. In that case horses are kept on privately owned land. The average area of land used for this purpose is 13 acres of which respondents own an average of 7 acres and lease the rest. Owners primarily keep their horse on pasture (38%) or a combination of stall and pasture (37%).

About 19% of horses in Connecticut are kept in stalls only.

(3) Almost 67% of the owners indicated that they have sufficient access to greenways and trails to ride their horses while the rest feel that they need more greenways and trails in Connecticut. Most respondents believe that the increasing development in open space is threatening natural trails and greenways.

(4) The predominant method of manure handling is spreading on fields (37%) either before or after composting.

(5) Two-thirds of horse owners wear a helmet while riding a horse but only 37% of horse owners wear a helmet while driving a horse. However, the number of horse owners who would require others to wear helmets riding or driving is higher than the number of horse owners who wear helmets while engaged in the same activity.

(6) Data obtained on market value estimates for horse-related assets (as of 2002) is shown in Table 4-1. Land and buildings were the highest valued assets on average.

(7) Data were also obtained on the use of horses as a source of income in various categories for horse owners, including a breakdown of horse related expenses. Only about 15% of respondents indicate income generation from their horses and the average of the amounts reported is $5,054. The average of total expenses, on the other hand, is $12,375.

Table 4-1: Fair Market Value (FMV) for Horse-Related Assets

Land	$299,043
Structures	$116,745
Equipment	$36,885

V. Horse Related Businesses

The main objectives of the horse-related business survey were to obtain information on the types of horse-related businesses in Connecticut, ownership profile, and economic characteristics - such as assets, number of employees, annual revenues and annual expenses. The survey was pre-tested. A total of 550 business surveys were mailed out and 77 (14%) were received back.

The major categories of activities carried out by these businesses are boarding of horses (25%), providing training and lessons (17%), and breeding (16%). Also, in many cases, a business carries out multiple activities. Most businesses are owner operated (89%) and horse facilities also tend to be owned (83%) rather then rented. The average industry experience of the owner is 22.8 years, but there is considerable variation in this regard (as reflected in the standard deviation of 14.61). The average business employs 1.6 full-time and 2.88 part-time employees (each of whom works an average of 6.5 hours/week). This translates into an average of 2.068 full-time equivalent (FTE) employees.

The average number of horses kept (or used) in a business is 16.7, but only 9.08 are owned by the business itself. Mixed breeds, Quarter Horses, and Thoroughbreds account for 52% of these horses. The average market value of total horses owned by a business is $58,536. Information was also obtained for related business assets, like land, buildings and equipment, as of December 31, 2002. As one might expect, land and buildings are, on average, the most valuable assets. Finally, business owners were asked to provide data related to revenues and expenses. The results obtained are summarized in Tables 5-1 and 5-2. Average estimates for each category of revenue and expense are reported.

Based on the above data, one could simply take the difference between average total revenues and average total expenses (i.e., $45,920) to be the average profits of a business, but this would not be right as in several instances businesses provided data for only revenues (or only expenses). The more correct approach would be to calculate profits of each business from the raw data (when profits can be meaningfully calculated) and then compute an average. With this latter approach, the estimate we get for annual profits is $70,840 per business.

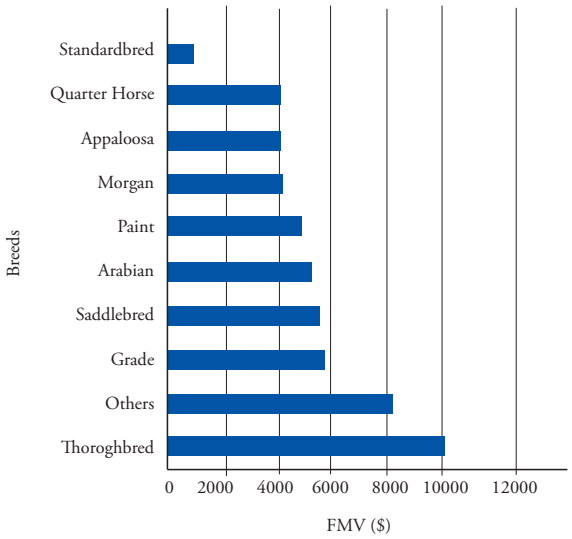
Table 5-1: Average Revenues by Category

Fees	$134,694
Sponsor and Advertising	$4,150
Stall Rentals	$49,916
Other Rentals	$15,464
Other	$96,395

Table 5-2: Average Expenses by Catagory

Utilities	$5,652
Equipment	$6,287
Labor	$54,148
Advertising	$5,358
Building and rental	$25,258
Other	$61,360

Figure 6-1:
Average Fair Market Value of Horses by Breed



VI. Statistical Analysis

VI.1 Determinats of Market Value of a Horse

The goals of our statistical analysis are two-fold. First, we seek to gain an understanding of the determinants of the market value of a horse as well as its value to the owner (which is often greater). Second, we would like to arrive at a preliminary figure for the value of the horse industry to Connecticut.

Based on our survey, the average fair market value (FMV) of a horse in Connecticut is $7,483 (standard deviation $10,148). There is, of course, significant variation by breed. As Figure 6-1 shows, the average FMV of a horse ranges from $10,084 (for Thoroughbreds) to $1,167 (for Standardbreds) - see Figure 6-1.

Owners were also asked whether they would be willing to sell their horse at fair market value (FMV). About 20% responded that they would do so, 7% said they would only sell at a price higher than FMV (in which case they were also asked to state the minimum price they would be willing to accept) and the remaining 73% indicated that they would never sell their horse. Given these statistics, it is evident that for the vast majority of cases FMV is not a good measure of the true value of a horse to its owner. Indeed, the fact that over seventy percent of owners would not be willing to part with their horses at any price indicates the strong attachment owners have to them as companion animals. This is also substantiated by the high cost of maintenance incurred compared with any monetary benefits from owning a horse. The implication, of course, is that any estimate of the state-wide value of horses that is based just on market prices is likely to seriously underestimate the true social value of horses.

In order to further explore the nature of fair market value and the willingness of horse-owners to sell (or not sell) their horses at this value, we carried out statistical exercises and regression analysis. Some of the results are noted below.

(1) The market value of a horse increases with age initially, but then falls after it has peaked.

(2) The manner in which the horse is used is an important determinant of its value. For example, if a horse is used for showing and competition or for breeding then the fair market value is higher. On the other hand, horses used for personal and family

recreation or work have lower market values.

(3) As the age of a horse increases, the owner is less willing to sell it.

(4) An owner is more willing to sell a horse if she owns more than one horse.

VI.2 Aggregative Analysis and Valuation of the Horse Industry

The results of our veterinarian, horse owner, and horse-related business surveys can be used in combination to perform an aggregative analysis and to draw some interesting inferences regarding the Connecticut horse industry. The key assumption we make is that our business survey mailing list is reasonably comprehensive. This is quite plausible since we used all available sources of business listings and unlike private horse owners, businesses have every interest in being advertised. Going by this information, there are about 550 horse-related businesses in Connecticut. According to our survey, the average number of horses owned per business is 9.08. Multiplying these two numbers yields 4,994 as the statewide estimate of horses owned by businesses. Subtracting this number from the veterinarian survey based total horse count figure (43,059) yields the total number of horses owned privately as 38,065.

The average number of horses per owner can be obtained easily from the owner survey as 2.3125. Dividing the total number of horses owned privately by this number yields a total horse-owner estimate of 16,461.

Given that there are 550 horse-related businesses, we can use the average statistic for full-time equivalent (FTE) employees from the business survey (i.e., 2.068) to infer the total number of FTE business employees in Connecticut as about 1,137. Similarly, multiplying the average annual income of horse-related businesses ($70,840) with the number of businesses yields total annual business income in the state as $38,962,000.

Finally, we can also infer the total values of horses. Multiplying the average fair market value of a horse from owner data ($7,483) with the total number of horses owned privately results in $284,840,395. The total value of horses owned by businesses is $32,192,600. Adding the two yields $317,032,995 as the total value of horses in the state.

VII. Summary and Policy Implications

We estimate the total number of horses in Connecticut as 43,059, which is likely to be on the conservative side. Our survey results show that most horses in Connecticut are owned individually and by females. The average age of horse owners is 45 years. While the majority of Connecticut residents are in the income group of less than $49,999, most Connecticut horse owners are in the income group of $50,000 - $99,999. The average income of horse owners in our sample is $100,000. Most Connecticut owners keep horses due to a desire for companionship or for personal and family recreation. Showing is also an important use category. Businesses own only about 11.6% of the total horses in Connecticut.

Horse owners are benefiting from keeping open space preserved. The majority of the horse-owning population feels that they have sufficient access to greenways and trails in Connecticut. Access to greenways and trails, however, is also the most common concern expressed by our sample. Most respondents believe that development and loss of open space is threatening natural trails and greenways.

The average fair market value of a privately owned horse in Connecticut (as of 2002) is $7,483 with significant variation by breed (Thoroughbreds are at the high end of the range at $10,084 and Standardbreds at the low end at $1,167). When owners were asked if they would sell their horse at fair market value, only 20% responded positively, while 7% would be willing to sell their horse above fair market value and 73% would never sell. This shows that fair market value is not a suitable measure of the true value of a horse to its owner and reveals the strong attachment that owners have for their horses. This can also be supported by the high cost of maintenance compared to any monetary benefits derived from the horse. The value of a horse increases initially with age then decreases after the horse has peaked. Horses used for showing and competition or breeding had a higher fair market value than horses used for personal and family recreation or work. The total value of horses in the state is estimated to be $317,032,995.

Horse owners also contribute to the economy through maintenance and use of their horses. A thorough review of horse business listings indicates that there are approximately 550 horse-related businesses in the state. The majority of respondents to our businesses survey are involved with boarding horses, providing training and lessons, and/or breeding. The horse businesses are facing an uphill task and are able to make only a modest income on average.

The Connecticut horse industry is a vital part of the state's economy. It is evident that personal and recreational uses and companionship are among the most important reasons private individuals keep horses. Most of the time, the expenses incurred by private individuals in upkeep of horses far exceed any monetary benefits from ownership. Given the significant aesthetic and other external benefits to society from this activity, an argument could very well be made for additional public support of the horse owning community. For example, one dimension that a number of horse-owners pointed to was the inadequacy of greenways and horse trails. Our survey questions relating to environmental and safety issues point to another dimension in which public support would be helpful, namely, provision of educational services to help improve manure handling and helmet use. Finally, we noted that a significant proportion of horse related businesses are either running losses or making little profit. These businesses play a crucial role in providing services for horse owners as well as other members of society. Mechanisms for direct or indirect public support clearly need to be devised to help sustain them.

We feel that our study marks an important first step in the quantitative description and economic evaluation of Connecticut's horse industry. Additional work does, however, need to be done. First of all, a complete impact analysis should be carried out in order to better assess the value of the horse industry to Connecticut. The industry has broader linkages with the economy and generates multiplier effects that should be taken into account. Second, a more comprehensive mailing list of horse owners and horse-related businesses should be assembled, and the surveys repeated in due course to improve the statistical reliability of the findings. Third, our methodology for enumerating horses and making economy-wide inferences needs to be applied to other parts of the country as well. It would be of particular interest to do a comparative analysis of a few New England states.

HORSES *in Connecticut*

Bibliography

Beattie B.R., T. Teegerstrom, J. Mortensen, and E. Monke. A Partial Economic Impact Analysis of Arizona's Horse Industry 2001 (http://www.eqgroup.com/Pdf/azequine_2000.pdf).

Delaware Agricultural Statistics Service and Delaware Department of Agriculture Delaware Equine Industry. 2004 (http://www.state.de.us/deptagri/pressrel/UpdatedEquineSurvey.pdf).

Deloitte Consulting, LLC. The Economic Impact of the Industry on the United States. American Horse Council Foundation, 2005.

Department of Animal and Dairy Sciences Pennsylvania State University, Pennsylvania Department of Agriculture. Pennsylvania's Equine Industry Inventory, Basic Economic and Demographic Characteristics, May 2003 (http://www.agriculture.state.pa.us/agriculture/lib/agriculture/horseracingfiles/equinesurveyresults-academic.pdf).

Economic Research Service, U.S. Department of Agriculture, "Rural-Urban Continuum Codes" 1993 (http://www.ers.usda.gov/Briefing/Rurality/ruralurbcon/).

Greene, E.A., J. Ather, L. King. Vermont Horse Count Equine Survey Report, University of Vermont, 2003.

Just Horses: A Directory for Connecticut, Massachusetts, Rhode Island, Eastern NY. Sleeping Giant Pony Club Trust, 2003.

Nadeau, J., F. Shah, A. Chaudhry, and J. Maripani, Connecticut's Horse Industry: A Demographic and Economic Analysis, College of Agricultural and Natural Resources, University of Connecticut, 2006.

University of New Hampshire Survey Center. Granite State Poll, 2003 (http://www.nhfarmbureau.org/publication/2004_equine_study_granite.pdf).

University of Connecticut

College of Agriculture and Natural Resources