



Veterinary Needs Assessment

January 2007



Foreword

In March, 2006, Representative Stratton Bone asked Dean Michael Blackwell and the Tennessee Veterinary Medical Association to assist The House Agriculture Committee with addressing concerns raised about the availability of rural veterinarians. A survey instrument was developed and administered to veterinarians practicing in Tennessee. The report here in is based upon a scientifically conducted survey administered to veterinarians across the state.

The survey instrument was administered by Ms. Linda Daugherty, Program Director of the Social Science Research Institute. Telephone interviewers called all veterinary participants and immediately recorded their responses. All interviews were conducted using computer-assisted telephone interviewing software. Data collection was initiated on July 15, 2006 and ended on December 15, 2006. Five hundred and ninety one veterinarians completed the survey instrument.

Select data points

There are 27 counties and communities that have two or fewer veterinarians in resident. When compared to 11 other randomly selected counties, economic parameters and life style concerns influenced veterinarians' decisions to locate in these communities. The presence of other health professionals paralleled the presence of veterinarians.

Based upon projected needs to hire additional veterinarians and upon impending retirements, 35 to 45 veterinarians will be needed in rural and mixed animal practices over the next five years.

Fifty percent of the veterinarians responding to the survey graduated from the UTCVM, 30% graduated from Auburn University, and 20% graduated from 24 other colleges or schools of veterinary medicine. Of the veterinarians engaged in rural practice 54% are UTCVM graduates, 26.5% are Auburn University graduates, and 19.5% graduated from the other 24 colleges of veterinary medicine.

Rural veterinarians reported that equine work generates the largest gross income and demands the majority of their time; beef practice was second to equine.

Rural and non-rural veterinarians (75.3%) believe that over the next five years the supply of rural veterinarians will decrease. They also reported that the demand for rural veterinary services to increase (32.2%), stay the same (42.1%), or decrease (25.7%). The majority of veterinarians believed that the decrease in rural veterinarians will adversely affect the state's ability to detect and monitor emerging and foreign animal diseases in livestock. While veterinarians reported the supply of rural veterinarians will decrease, the actual numbers engaged in rural practices during 2000 – 20050 increased. There was a rebound in the number of veterinarians engaged in rural practice as there was a decrease in rural veterinarians from 1995 - 1999.

Summary:

This survey recognizes the importance of veterinarians in livestock production, health management of companion animals, and in public health. Livestock production is a vital component of the livelihoods of producers in Tennessee, and contributes millions of dollars to the state's economy. To be a healthy and robust sector, animal agriculture production must engage veterinarians for health and production management programs.

The data summarized in this report are the result of a scientifically-based survey of veterinarians in Tennessee. Through the survey instrument, responses from specific questions were recorded and subsequently analyzed in order to address issues of critical importance to the profession and practice of veterinary medicine. Veterinarians in Tennessee are providing expert medical care to clients in rural and non-rural settings. However, there are 27 counties in Tennessee that have two or fewer resident veterinarians. Economic constraints of the communities and life style concerns appear to be the primary reasons for veterinarians not locating in these counties. These issues are also apparent when considering the number of other medical professionals residing in these counties. When compared to randomly selected counties that have adequate numbers of veterinarians, a parallel lack of presence of other medical professionals is evident. In these counties and communities, science-based policies must be developed and implemented to enhance the economic attractiveness of the communities for all medical professionals.

The College of Veterinary Medicine at the University of Tennessee has as its principle mission the education of veterinary students. Since graduating its first class in 1979, graduates of the UTCVM comprise 50% of the licensed veterinarians practicing in Tennessee. While there are counties and communities that are clearly deficient in veterinarians, 82% of producers did not experience a problem in obtaining veterinary services. Based on states that have greater production animal populations and similar human populations, Tennessee's ratio of 22 veterinarians/100,000 population appears reasonable. Equally important, is that the number of veterinarians/100,000 population continues to increase along with the increase in population. UTCVM graduates are residing in the state and providing veterinary services. During the last 5 years, a greater percentage of those residing in the state have entered rural practices. The college must continue its efforts to admit students and graduate veterinarians interested in mixed and rural animal practice.

Introduction

During a March 2006 Tennessee Legislative session, UT College of Veterinary Medicine (UTCVM) Dean Dr. Michael Blackwell and the Tennessee Veterinary Medical Association (TVMA) were asked by members of the House Agriculture Committee to conduct a study that would assess the veterinary workforce and the economic impact of veterinary medicine on the state of Tennessee. In response to this request, Dean Blackwell asked Dr. Robert Holland, head of the Department of Large Animal Clinical Sciences to lead a study designed to address the veterinary workforce and economic impact questions. Dr. Dennis Geiser, Assistant Dean Organizational Development and Outreach was asked to engage in discussions with the TVMA membership to present three sessions across the state discussing issues relevant to the questions posed by the House Agriculture Committee.

As a result of discussions with Dean Blackwell, TVMA membership, and veterinarians across the state four questions were posed:

Question 1: Based on input from veterinary practitioners, what is the condition of large animal practice in Tennessee and what are the workforce needs for large animal veterinarians in the state?

Question 2: What are the demographics of rural Tennessee that would inhibit or prohibit establishment of profitable large animal practices?

Question 3: What is the value of large animal veterinarians to Tennessee farmers engaged in animal production?

Question 4: What is the impact of veterinary medicine on the state's economy?

Sample Frame

Based on the questions posed, the UTCVM and TVMA contracted with the UT Social Science Research Institute and the Department of Agricultural Economics to conduct the surveys. A sample frame was developed to address Questions 1 and 2. The survey format was fashioned after the one developed and used by the Iowa State University College of Veterinary Medicine and Center for Survey Statistics and Methodology. A sample frame was constructed by combining the membership list of the TVMA with a list of licensed veterinarians practicing in the state of Tennessee. To be eligible for inclusion in the study a veterinarian had to be licensed in Tennessee and actively practicing in the state.

Data Collection

Ms. Linda Daugherty, Program Director of the Social Science Research Institute was contracted to administer the survey instrument. Telephone interviewers, trained in the principles and procedures of telephone interviewing, called all veterinary participants and immediately recorded their responses. All interviews were conducted using computer-

assisted telephone interviewing software. Every attempt was made to conduct interviews at a convenient time for the respondent, and interviews were frequently conducted before and after business hours. Supervisors from the Social Science Research Institute monitored the interviewing process. Data collection was initiated on July 15, 2006 and ended on December 15, 2006.

One month prior to initiating data collection, the TVMA sent an advance to all licensed veterinarians and TVMA members informing them of the study and asking their participation. Two weeks prior to initiating data collection, another letter was sent to all potential respondents informing them that the study was about to commence.

Concurrently, a postcard from the Social Science Research Institute was sent to all potential respondents introducing the Social Science Research Institute and informing potential respondents of the survey process and requesting a contact time. Two months into the survey another letter from the Social Science Research Institute was mailed to potential respondents requesting their further participation.

A sample of 1,424 veterinarians was included in the study. Forty eight veterinarians were not eligible for inclusion leaving a sample population of 1,376 veterinarians. At least two attempts were made by telephone to contact the 1,376 veterinarians. However, successful interviews were completed with 591 veterinarians. Of the remaining sample population, 88 veterinarians chose not to participate and correct telephone numbers or contact information was not established for 221. Multiple attempts were made to complete interviews with the remaining 476 veterinarians. However these attempts were not

successful. The overall response rate for the survey was 42.95% and the overall cooperation rate was 85.10%. Overall, data collection was successful, unit response rate and cooperation were excellent, and these parameters were comparable with those observed in similarly conducted national surveys.

Demographics

Of the 591 veterinarians interviewed, 91.9% are currently working in a private clinical practice, 3.4% are employed by a business or corporation, and 4.7% are currently engaged in teaching or research at a college or university. The majority, 42.2%, practice medicine in a city with a population of more than 50,000; 27.0% practice in a town of 10,000 to 50,000; 12.9% in a town of 5,000 to 10,000; 8.1% in a town of less than 5,000; and 9.8% in rural areas outside of city limits. When provided with a standardized definition of a rural practice, 116 (21.4%) of those currently working in private practice are engaged in practice with a rural focus and 427 (78.6%) are working in a practice with a non-rural focus.

The average age of veterinarians taking part in this survey is 45 years. They have been practicing veterinary medicine an average of 18 years and have been practicing in Tennessee for an average of 16 years.

The number of female veterinarians has consistently increased through the years. Approximately 37% (36.7%) of the veterinarians participating in the survey were female,

with 16.1% reporting that they are primarily engaged in a rural practice. Thirty percent of the respondents graduated in the past five years while only 3.2% graduated before 1980. UTCVM graduates account for 72.7% of the female veterinarians engaged in rural practice while 9.1% are Auburn University graduates, and 18.2% graduated from other colleges of veterinary medicine.

Non-Rural Veterinarians

Veterinarians working in a non-rural focused practice were asked about their experience with large animals in the past, and approximately 40% (39.9%) reported that their practice had worked with large animals in the past. Moreover, 60.4% reported that they had personally worked with large animals in the past. Personal preference was cited by 27.1% of those responding as the main reason for reducing or eliminating large animals from their practice. This was followed by 24.5% reporting that a decrease in demand for their services was an important reason for reducing or eliminating large animal practice. However, almost half, 41% indicated some other reason for the reduction or elimination. Those reasons are equally divided between economic viability and physical demands. These reasons were repeated when the non-rural veterinarians were asked for the main reason for not pursuing large animal work. The main reason cited was personal preference followed by physical demands.

Rural Veterinarians

Rural veterinarians report that equine work generates the largest gross income and demands the majority their time. Of those interviewed, 64.9% of the rural veterinarians reported the majority of their time was spent with equine and 11.7% reported beef. This trend was consistent regardless of the year of graduation. Income was closely aligned with 69.8% reporting equine generated the most dollars and 8.5% reporting beef.

Year of Graduation	Up to 1980	1980 - 1985	1986 - 1990	1991 - 1995	1996 - 2000	2001 - 2005
Swine	28.6%	42.1%	38.9%	38.5%	5.6%	29.6%
Dairy	61.9%	42.1%	50.0%	46.2%	33.3%	51.9%
Beef	71.4%	73.7%	66.7%	61.5%	50.0%	70.4%
Equine	81.0%	84.2%	88.9%	100%	83.3%	88.9%
Sheep and goats	52.4%	63.2%	61.1%	84.6%	61.1%	81.5%
Poultry	23.8%	31.6%	27.8%	30.8%	22.2%	22.2%
Specialty animals	38.1%	42.1%	33.3%	53.8%	27.8%	48.1%

Almost half of the respondents reported their income to range from \$50,000 to \$100,000.

As expected, those in practice the longest were more likely to have income exceeding \$100,000. There is a disparity between equine and food animal practices with equine practices faring better economically than their food animal counterparts.

2005 Annual Income	< \$25K	\$25K - \$50K	\$50K - \$75K	\$75K - \$100K	\$100K - \$150K	\$150K+
Community size						
Rural area	11.8%	11.8%	35.3%	23.5%	15.7%	2.0%
Less than 5,000	10.3%	10.3%	23.1%	23.5%	15.4%	25.6%
5,000 to 10,000	3.1%	18.8%	21.9%	23.5%	20.3%	12.5%
10,000 to 50,000	6.5%	11.6%	23.9%	15.2%	21.7%	21.0%
50,000 or more	8.3%	12.5%	30.1%	18.1%	14.8%	16.2%
Focus						
Equine	7.1%	11.4%	30.0%	21.4%	10.0%	20.0%
Food animal	11.1%	11.1%	27.8%	22.2%	19.4%	8.3%
Mixed	7.0%	11.6%	30.2%	18.6%	16.3%	16.3%
Small animal	7.7%	13.5%	26.9%	17.6%	18.4%	15.9%
Year of Graduation						
Up to 1980	3.8%	7.7%	13.1%	20.0%	29.2%	26.2%
1980 - 1985	3.6%	6.3%	19.6%	28.6%	21.4%	20.5%
1986 - 1990	14.3%	7.8%	14.3%	32.5%	14.3%	16.9%
1991- 1995	7.0%	19.3%	29.8%	14.0%	15.8%	14.0%
1996 - 2000	5.7%	12.5%	39.8%	20.5%	12.5%	9.1%
2000 - 2005	14.1%	26.1%	51.1%	5.4%	3.3%	0.0%

Rural veterinarians were asked several questions about how they conduct business.

When asked, 58.3% indicated there is a trend toward fewer farm calls and more office examinations. Forty-eight miles was the average number of miles they were willing to travel to treat an animal, but they reported clients were willing to travel an average of 75 miles for their services.

Future of the Rural Veterinary Practices

Veterinarians with a rural focus were asked about their need to increase the overall number of veterinarians working with large animals and the need to hire replacements due to retirement within the next five years. Almost 40% reported that they would need to increase the number of veterinarians while only 21.9% reported a need to hire due to retirements. Based on the need to hire additional veterinarians and the need to replace those who will be retiring, 35 to 45 rural veterinarians will be needed over the next five years to meet the expectations. These projections are based solely on inputs from veterinarians engaged in rural practice, and do take into consideration producer needs.

As students, 50% of the veterinarians were not interested in pursuing employment in a rural practice. When asked the primary reason they chose not to pursue farm animal, food animal or equine practice, a lack of interest in this type of practice was the primary reason (25.6%), followed by physical demands and health risks associated with large animal practice (24.4%). Approximately 24% of respondents stated other reasons.

Among this 24%, half voiced concerns about farm stability and the influences of urbanization on farm longevity. Spousal desires and on call responsibilities accounted for 27%. As practicing veterinarians, the respondents were asked what they considered the most important disadvantage of entering a rural practice. Approximately 49% (48.6%) reported acquiring appropriate financial compensation as the primary disadvantage followed by 22.4% reporting physical demands and health risks. Concerns

about practicing a high quality of medicine was voiced by 7.2% and over the counter dispensing of drugs was reported as a disadvantage by 2.5% of the veterinarians.

Rural and non-rural veterinarians (75.3%) believe that over the next five years the supply of rural veterinarians will decrease. These same veterinarians reported that they expected the demand for rural veterinary services to increase (32.2%), stay the same (42.1%) or decrease (25.7%). These same veterinarians (68.5%) believed that this decrease in rural veterinarians will adversely affect the state's ability to detect and monitor emerging and foreign animal diseases in livestock.

When veterinarians engaged in rural practice were asked what they felt would be the most important obstacle for hiring a rural veterinarian, 37.7% of them noted the decreasing supply of graduates who are large animal oriented as the number one obstacle. Another obstacle was the time demands which included on call hours (21.9%). Relative to time demands and number of hours on call, 42.2% of rural veterinarians reported that they expected their hours to remain the same, 25% expected their hours to decrease, and 29% expected to have some increase in working hours.

The perception of the decreasing supply of graduates with a rural focus is found again when all veterinarians were asked about the ability to sell their practices in the future. Fifty percent and 43.2% of veterinarians in mixed animal practice and predominantly companion animal practices respectively are confident they will be able to sell their practices. Veterinarians engaged in equine and food animal practices are considerably

less confident that they will be able to sell their practices. The ability or lack thereof to sell their practices will, in all probability, influence retirement decisions and lifestyles in retirement. Interestingly, the estimated cost of starting a practice similar to theirs is not driving this lack of confidence.

Ability to Sell Practice	Not at all Likely	2	3	4	Very Likely
Practice Focus					
Equine	22.4%	18.4%	20.4%	20.4%	18.4%
Food animal	26.7%	26.7%	10.0%	10.0%	26.7%
Mixed	6.3%	15.6%	9.4%	18.8%	50.0%
Small animal	6.8%	7.7%	19.4%	23.0%	43.2%
Cost of Starting Similar Practice					
< \$250,000	21.9%	18.8%	14.6%	16.7%	28.1%
\$250,001 - \$500,000	5.5%	11.0%	20.9%	20.9%	41.8%
\$500,001 - \$1,000,000	6.3%	6.3%	16.3%	23.8%	47.5%
\$1,000,001 +	5.9%	5.9%	17.6%	23.5%	47.1%

Methods to Increase Availability Of Large Animal Health Care

All veterinarians were asked to rate the effectiveness of potential methods to increase the availability of health care services for large animals. The most effective method was to offer financial incentives to veterinarians whereas over the counter availability of drugs is considered not effective.

	Very effective	Somewhat effective	Not effective
Financial incentives	43.1%	42.9%	13.4%
Scholarship programs	33.0%	51.7%	14.7%
Workshops for producers*	11.4%	47.0%	38.7%
Increase duties of vet techs	16.4%	37.8%	43.3%
Increase responsibility of producers	3.5%	18.0%	76.2%
More over the counter drugs	.6%	6.6%	91.7%

Results of this study suggest that the number of graduates with a rural focus has begun to increase over the past five years. The number of graduates with a rural focus hit a low between 1996 and 2000, but has begun a rebound over the past five years.

Veterinarians were asked to report their student loan debt after graduating from veterinary school. An upward trend in debt load can be seen through the years. Rural veterinarians who spend most of their time in food animal predominant practices tend to have a higher debt load than their counterparts. Approximately 83.4% of veterinarians who graduated from 2000 through 2005 and engaged in food animal predominant practices had debt loads ranging from \$50,000 to \$100,000. For these individuals, the debt load did not appear to influence their decision to enter a rural practice.

Year of Graduation	Up to 1980	1980-1985	1986-1990	1991-1995	1996-2000	2000 - 2005
Equine						
No debt	25.0%	10.0%	25.0%	27.3%	20.0%	23.8%
< \$25K	66.7%	50.0%	62.5%	27.3%	30.0%	14.3%
\$25K - \$50K	8.3%	10.0%	12.5%	18.2%	20.0%	33.3%
\$50K - \$75K	0.0%	30.0%	0.0%	27.3%	0.0%	4.8%
\$75K - \$100K	0.0%	0.0%	0.0%	0.0%	30.0%	14.3%
\$100K - \$150K	0.0%	0.0%	0.0%	0.0%	0.0%	4.8%
\$150K +	0.0%	0.0%	0.0%	0.0%	0.0%	4.8%
Food animal						
No debt	62.5%	11.1%	22.2%	0.0%	33.3%	16.7%
< \$25K	25.0%	77.8%	33.3%	0.0%	0.0%	0.0%
\$25K - \$50K	12.5%	11.1%	22.2%	100.0%	16.7%	0.0%
\$50K - \$75K	0.0%	0.0%	0.0%	0.0%	33.3%	16.7%
\$75K - \$100K	0.0%	0.0%	22.2%	0.0%	16.7%	66.7%
\$150K +	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mixed						
No debt	35.7%	12.5%	42.9%	0.0%	20.0%	14.3%
< \$25K	57.1%	75.0%	42.9%	66.7%	20.0%	28.6%

\$25K - \$50K	7.1%	0.0%	14.3%	33.3%	60.0%	14.3%
\$50K - \$75K	0.0%	12.5%	0.0%	0.0%	0.0%	14.3%
\$75K - \$100K	0.0%	0.0%	0.0%	0.0%	0.0%	28.6%
\$150K +	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Small animal						
No debt	53.9%	39.5%	36.2%	28.2%	23.4%	19.0%
< \$25K	43.8%	51.3%	36.2%	25.6%	9.4%	6.3%
\$25K - \$50K	2.2%	9.2%	21.3%	35.9%	21.9%	15.9%
\$50K - \$75K	0.0%	0.0%	6.4%	7.7%	20.3%	22.2%
\$75K - \$100K	0.0%	0.0%	0.0%	0.0%	18.8%	23.8%
\$100K - \$150K	0.0%	0.0%	0.0%	2.6%	4.7%	12.7%
\$150K +	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%

Estimates of veterinary density:

In recent years, numerous articles have been published regarding the supply and demand of veterinarians in food supply veterinary medicine - verbiage used to describe food animal production medicine, public health, industrial food animal veterinary medicine, etc. The deficiency of food supply veterinarians has been predicted to expand by 12 to 13% between now and 2016. Static graduation rates have been mentioned as one of the factors contributing to the deficiency. While there is a perception of static graduation rates, this perception does not appear to hold true for Tennessee and surrounding states. During a 20 year period of time (1986 to 2006), the numbers of licensed veterinarians in Tennessee and neighboring states have increased relative to the expanding population. In Tennessee for 1986 there were 16 veterinarians/100,000 population and in 2006 there were 22 veterinarians/100,000 population. For the years 1980 through 1986, the CVM enrolled 60 to 80 professional students per class, for 1992 to 1998, the CVM enrolled 60 to 65 students per class, and for 1999 to 2006, 65 to 70 students were enrolled per class. The increase in veterinarians/100,000 population is most likely attributable to UT

graduates electing to practice in Tennessee and not due to a robust influx of graduates from other states.

VETERINARIANS/100,000 POPULATION

<u>STATE</u>	<u>1986</u>	<u>1996</u>	<u>2006</u>
Alabama	16.4	19.4	21.4
California	13.8	14.4	15.6
Georgia	15.3	18.5	20.7
Iowa	38.7	38.2	35.8
Kansas	31.1	36.5	37.7
Kentucky	17.1	21.0	24.8
Michigan	15.0	17.5	21.0
North Carolina	15.0	21.0	25.4
Tennessee	16.0	18.6	22.0
Texas	18.0	19.6	20.0
Virginia	17.0	22.0	27.2
West Virginia	8.6	12.5	16.0

During this 20 year period, Iowa was the only state that experienced a decrease in the density of veterinarians. Given the national population expansion, it appears colleges of veterinary medicine in the southeast are staying ahead of the population demands that existed 20 years earlier.

When UTCVM 4th year veterinary students responded to the question “in which state would you most like to find employment” and (for the period 1995 through 2000), 47.8% chose Tennessee as the preferred state in which to practice with 48.5% actually becoming employed in Tennessee. For 2002 through 2006, 59.9% of UT graduates chose Tennessee as the preferred state in which they wanted to practice with 42.5% electing to remain in the state to practice. These numbers are further supported by the survey results, as 50% of the veterinarians participating in this survey graduated from the University of Tennessee, 30% graduated from Auburn University, and the remaining 20% graduated from 24 different Colleges or Schools of Veterinary Medicine. The College of Veterinary Medicine at the University of Tennessee is fulfilling one of its mission’s of providing licensed veterinarians to the state.

The percentage of UT graduates electing to practice in rural areas continues to increase albeit slowly. UTCVM graduated its first class in 1979, so most veterinarians engaged in rural practice were Auburn University graduates. For a period of time up to 1985, 12.1% of the rural veterinarians participating in the survey were UT graduates and 14.7% were Auburn University graduates. For the period 2000 – 2005, 15.5% were UT graduates and 2.6% were Auburn graduates.

Location of veterinarians compared to other health professionals

According to Tennessee Health Department data 27 counties in Tennessee had two or fewer veterinarians as residents, i.e. there were nine counties that had 0 veterinarians listed, eight counties with 1 veterinarian each, and ten counties with 2 veterinarians each. Ninety percent of the veterinarians responded that revenue potential of an area was either

somewhat important (40.6%) or extremely important (49.2%) for them deciding where to locate.

To assess whether local farm income influenced the number of veterinarians locating in a community, a relative farm income index was calculated based on livestock sales and government payments. While this index does not take into account off farm income that goes to support the farming enterprise or the local tax abatements, it provides information relative to the income potential of that particular farming community.

Income generated from livestock sales and government payments were examined to assess if these two sources of income influenced veterinarians locating to those counties. In addition, human population and the number of other health professionals were determined for these same counties. An additional 11 counties were randomly selected from the remaining 68 counties and the same parameters were examined. At least one county had to be from one health department region.

Of the parameters examined, farm density and human populations appear to influence the number of veterinarians locating in a county. Although 40.6% of the veterinarians reported income potential of an area was extremely important in their decision as to where to locate, it is also highly probable that the vast majority of new veterinary graduates would not have an idea as to the farming income of a community. It is logical then that rural income would not be a predetermined factor for new graduates to establish a practice in a community. Working in established practices with little to no emergency

responsibilities was cited by new graduates as being very important for them when selecting a practice in which to work. In effect, and based on veterinary input, it is likely that the 27 counties that have two or fewer veterinarians will continue along this line, unless other incentives are provided for veterinarians to locate there. Moreover, overwhelmingly, veterinarians reported that they are very happy in the communities in which they live. In addition to economic considerations, other factors that influence lifestyle need to be addressed in counties lacking veterinarians.

The number of other health professionals in the 27 counties parallels the presence of veterinarians. Studies conducted by some Midwestern universities have shown that a strong farm economy is necessary to sustain rural communities. Strong farm economies tend to be supported by farm families residing in the community and less so with large integrated farms where the owners may reside in another state. Secondly, since the 1960's there has been a trend for off farm income of farm households to support the farm income. Farming communities located near cities or large metropolitan centers offer off farm opportunities for farmers to supplement to their income. These communities tend to be better off financially, thereby providing a spectrum of opportunities for other professionals. Hobby farming and/or raising pet livestock is an expanding aspect of rural practice. Such farms contribute very little to the state wide farm economic picture, but are a source of income for rural mixed practitioners. These concepts appear to be in play in Tennessee. The 11 randomly selected counties had an average of 12 veterinarians, had average livestock sales per farm of \$14,836.00, and there were an average of 1688 farms per county. The average human population was 51,757 with considerably more medical

doctors and dentists residing in those counties. Interestingly, data provided in the Tennessee Educational Needs Index, list 31 of 38 of the counties examined to have economic challenges that are most critical. The economic factor is based on the unemployment rate, percent of population under 65 in poverty, median family income, per capita income, and percent manufacturing employment.

					Avg. Gov. Pymt.	
No. of	Avg. No. of	Avg. Livestock	Avg. No.	Avg. Livestock	Per Farm for	Avg. Human
Counties	Veterinarians	Sales	of Farms	Sales/Farm	Farms Recv'g Pymt.	Population
† 9	0	\$3,483,111.00	360	\$9,675.00	\$4,544.00	8,857
‡ 8	1	\$5,792,667.00	567	\$10,216.00	\$1,952.00	13,796
• 10	2	\$10,910,400.00	566	\$19,276.00	\$3,076.00	21,066
§ 11	12	\$25,043,000.00	1688	\$14,836.00	\$3,259.00	51,757

† 7 of 9 counties have livestock sales that exceeded crop sales; 8 of 9 counties have economic challenges that are most critical.

‡ 7 of 8 counties have livestock sales that exceeded crop sales; 7 of 8 counties have economic challenges that are most critical.

• 7 of 10 counties have livestock sales that exceeded crop sales; 9 of 10 counties have economic challenges that are most critical.

§ 9 of 11 counties have livestock sales that exceeded crop sales; 7 of 11 counties have economic challenges that are most critical.

Comparison to other medical professionals

Number of Counties	Average Number of Veterinarians	Average Number of M.D.	Average Number of O.D.	Average Number of D.D.S.
9	0	3.9	0.3	1.3
8	1	7.25	1.25	3.0
10	2	12.3	1.4	4.9
11	12	100.4	2.7	17.1

M.D. = Medical Doctor
 O.D. = Osteopathic Doctor
 D.D.S. = Dentist

Financial compensation:

Veterinarians in Tennessee report that new graduates with a focus in rural practice should be paid a starting salary between \$40,000 to \$60,000. This same level of compensation was reported for those electing to engage in either food animal or equine predominant practices. However, with three years of experience, 57% of all veterinarians believed rural veterinarians should be compensated at \$70,000 and higher. These levels of compensation parallels those reported by the AVMA.

Conclusions:

This survey recognizes the importance of veterinarians in livestock production, health management of companion animals, and in public health. Livestock production is a vital component of the livelihoods of producers in Tennessee, and contributes millions of dollars to the state’s economy. To be a healthy and robust sector, animal agriculture production must engage veterinarians for health and production management programs.

The data summarized in this report are the result of a scientifically-based survey of veterinarians in Tennessee. Through the survey instrument, responses from specific

questions were recorded and subsequently analyzed in order to address issues of critical importance to the profession and practice of veterinary medicine. Veterinarians in Tennessee are providing expert medical care to clients in rural and non-rural settings. However, there are 27 counties in Tennessee that have two or fewer resident veterinarians. Economic constraints of the communities and life style concerns appear to be the primary reasons for veterinarians not locating in these counties. These issues are also apparent when considering the number of other medical professionals residing in these counties. When compared to randomly selected counties that have adequate numbers of veterinarians, a parallel lack of presence of other medical professionals is evident. In these counties and communities, science-based policies must be developed and implemented to enhance the economic attractiveness of the communities for all medical professionals.

The College of Veterinary Medicine at the University of Tennessee has as its principle mission the education of veterinary students. Since graduating its first class in 1979, graduates of the UTCVM comprise 50% of the licensed veterinarians practicing in Tennessee. While there are counties and communities that are clearly deficient in veterinarians, 82% of producers did not experience a problem in obtaining veterinary services. Based on states that have greater production animal populations and similar human populations, Tennessee's ratio of 22 veterinarians/100,000 population appears reasonable. Equally important, is that the number of veterinarians/100,000 population continues to increase along with the increase in population. UTCVM graduates are residing in the state and providing veterinary services. During the last 5 years, a greater

percentage of those residing in the state have entered rural practices. The college must continue its efforts to admit students and graduate veterinarians interested in mixed and rural animal practice.