



**Projecting the Need for
Veterinary Medical Education
in Texas**

A Report to the Texas Legislature

January 2009



Texas Higher Education Coordinating Board

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Mission of the Coordinating Board

The Texas Higher Education Coordinating Board's mission is to work with the Legislature, Governor, governing boards, higher education institutions and other entities to help Texas meet the goals of the state's higher education plan, *Closing the Gaps by 2015*, and thereby provide the people of Texas the widest access to higher education of the highest quality in the most efficient manner.

Philosophy of the Coordinating Board

The Texas Higher Education Coordinating Board will promote access to quality higher education across the state with the conviction that access without quality is mediocrity and that quality without access is unacceptable. The Board will be open, ethical, responsive, and committed to public service. The Board will approach its work with a sense of purpose and responsibility to the people of Texas and is committed to the best use of public monies. The Coordinating Board will engage in actions that add value to Texas and to higher education. The agency will avoid efforts that do not add value or that are duplicated by other entities.

This document is available on the Texas Higher Education Coordinating Board Website:
<http://www.thecb.state.tx.us>

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Executive Summary

The goal of this report is to assess the current state of veterinary medical education in Texas and project the need for resources in the near future. The methodology for this study is outlined in the *Methodology for Projecting the Need for Professional Education in Texas* included as Appendix A-1. Also, this study draws upon a variety of national, state, and institutional sources for data. Information has been selected and compiled by Coordinating Board staff, and the entire report has been reviewed by independent consultants who are professionals in the field.

Key Findings

Student Opportunity

- ❖ Beginning in the fall of 2004, there has been a steady increase in applicants to U.S. veterinary schools. Applicants to the Texas A&M University College of Veterinary Medicine rose over 19 percent from 2004 to 2007, but have decreased over 15 percent by 2008.
- ❖ In 2003, the TAMU College of Veterinary Medicine increased its capacity, and enrollments have remained constant ever since. The TAMU College of Veterinary Medicine accepts very few out-of-state students.
- ❖ Minority populations are poorly represented in veterinary schools nationwide and in Texas. The percentages fluctuate between 0 and 9 percent, and African Americans and Hispanics are the most seriously under-represented groups.
- ❖ Since spring 1998, the percent of women earning veterinary degrees in U.S. veterinary schools and at the TAMU College of Veterinary Medicine has steadily increased. Veterinary medicine has recently become one of the few science-oriented fields where women are sustaining a significant majority nationwide.
- ❖ There are almost three times as many applicants as there are available seats at the TAMU College of Veterinary Medicine, and it has sustained a very high acceptance rate. As the Texas population grows and graduation rates remain steady, competition for admission is increasing while student opportunity to attend veterinary school in Texas is declining.
- ❖ Resident tuition and fees at the Texas A&M University College of Veterinary Medicine are below the average resident tuition and fees for veterinary schools in the 10 most populous states.

Animal Information

- ❖ Texas has more head of cattle than any other state in the country, and most of these cattle are concentrated in the High Plains, South Texas, and Central Texas regions. Texas also has almost three times as many horses than any of the other nine most populous states.

Workforce

- ❖ Texas is ninth among the 10 most populous states in the number of actively practicing veterinarians per 100,000 of the population. Among all of the states and the District of Columbia, Texas ranks 45th in the number of active veterinarians per 100,000 of the population.
- ❖ Texas has more food and fiber animals than any other state, and Texas is last among the 10 most populous states in veterinarians per 1 million head.
- ❖ There are more small animal veterinarians than food and fiber, research, and equine veterinarians combined in every region of the state.

Conclusions

- ❖ No new veterinary school is recommended at this time. Texas is meeting the current demand for small-animal veterinarians (the area of highest growth), supplemented by the importation of almost one-third of its veterinary workforce from other states.
- ❖ Enrollment could be expanded at the TAMU College of Veterinary Medicine. Increased enrollment would relieve pressure on the demand for new veterinarians as the Texas population is projected to expand, and if targeted appropriately, may help to send more badly needed food and fiber animal veterinarians to rural areas.
- ❖ Texas cattle ranchers are being constrained by a serious shortage of food and fiber veterinarians. There are limitations to what higher education can do to address the problem, since salary differences among specialists in the workplace often end up determining the patterns of veterinary practice. The College of Veterinary Medicine should be offered the resources necessary to continue and expand their efforts to promote food and fiber animal practice, particularly to non-corporate clients in rural areas. One such effort would be a forgivable loan of up to \$25,000 a year payable to students who do large-animal practice in a rural community, which could serve the dual purpose of attracting candidates from under-represented populations who may not otherwise be able to afford veterinary school.
- ❖ Recruiting students from under-represented populations should remain a top priority for the TAMU College of Veterinary Medicine, although it should be recognized that the pool of applicants in Texas and across the nation is very small.
- ❖ Increased funding for the TAMU College of Veterinary Medicine should begin with the baseline of the Coordinating Board's recommended level of formula funding for 2010-11. Increased support from the state should come with the recognition that the TAMU College of Veterinary Medicine has kept its tuition as affordable as possible, over \$7000 less than the average veterinary school tuition in the 10 most populous states.

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Introduction

To address planning for education needs related to specific disciplines, the Texas Higher Education Coordinating Board (Coordinating Board) adopted a *Methodology for Projecting the Need for Professional Education in Texas* in April 2002. Several subsequent Coordinating Board-adopted reports based on that methodology presented analyses of future need for professional education in medicine, law, pharmacy, and veterinary medicine based on two factors: the need for professional services and the opportunity for students to enter selected professions. The full text of the 2002 *Methodology* is included as Appendix A-1.

This 2009 report presents an update to the *Projecting the Need for Veterinary Medical Education in Texas*. New information, examples, and perspectives based on demographic and educational changes since 2002 are presented in the body of this report. Additional information and data are available in the appendices.

Issues and questions parallel to those for other professions arise in this study:

- Does the state need more veterinarians? If so, why, what kind, and where?
- Is there appropriate opportunity for Texas baccalaureate graduates to attend veterinary school, now and in the foreseeable future?
- If the state decides to educate more veterinarians, how should this best be done?
- Do residents of all ethnicities, genders, and regions of the state have opportunities to attend veterinary school?

Additional questions and challenges arise that are specific to veterinary education and services. For example, estimating the number of veterinarians that Texas will need to serve its increasing population is especially difficult because of a lack of a recommended governmental or professional standard for the desired ratio of veterinarians per human or animal population. Also, the total number of veterinarians in the state may not necessarily be an accurate indicator of total veterinary service: there may be an ample supply of small-animal veterinarians in urban areas, and a severe shortage of food-and-fiber veterinarians in rural areas. While this report includes various cross-state comparisons, these measures alone may not be sufficient to determine optimal or minimal need for veterinary services in the state.

The Coordinating Board offers recommendations with the acknowledgement that any decision about the expansion of the existing veterinary school at Texas A&M University, or the creation of a new veterinary school, should be made through an analysis of projected demand for student opportunity and demand for services.

Acknowledgements

The Coordinating Board would like to thank several individuals for their assistance with this study. Outside consultants—Dean Joan C. Hendricks of the School of Veterinary Medicine at the University of Pennsylvania; and David Granstrom, Director of the Education and Research division of the American Veterinary Medical Association—provided critical insights and revisions on this report. Richard Adams, Dean of the Texas A&M University College of Veterinary Medicine, was highly generous with his time and expertise. Diana Fagen, the librarian of the American Veterinary Medical Association, went to great lengths to provide comprehensive job

opportunity data. Ina Franz, of the Texas Board of Veterinary Medical Examiners, was consistently prompt and helpful with a steady stream of inquiries. Finally, the Coordinating Board owes a special debt to our research associates—Mahyar Entezari, Elizabeth Mayer, and especially Freddie Obregón.

Student Opportunity – Institutional and Student Data

Schools

Texas has one public college of veterinary medicine, the same as most states with veterinary schools. Only California and Alabama have two.

Veterinary School Locations in the U.S.

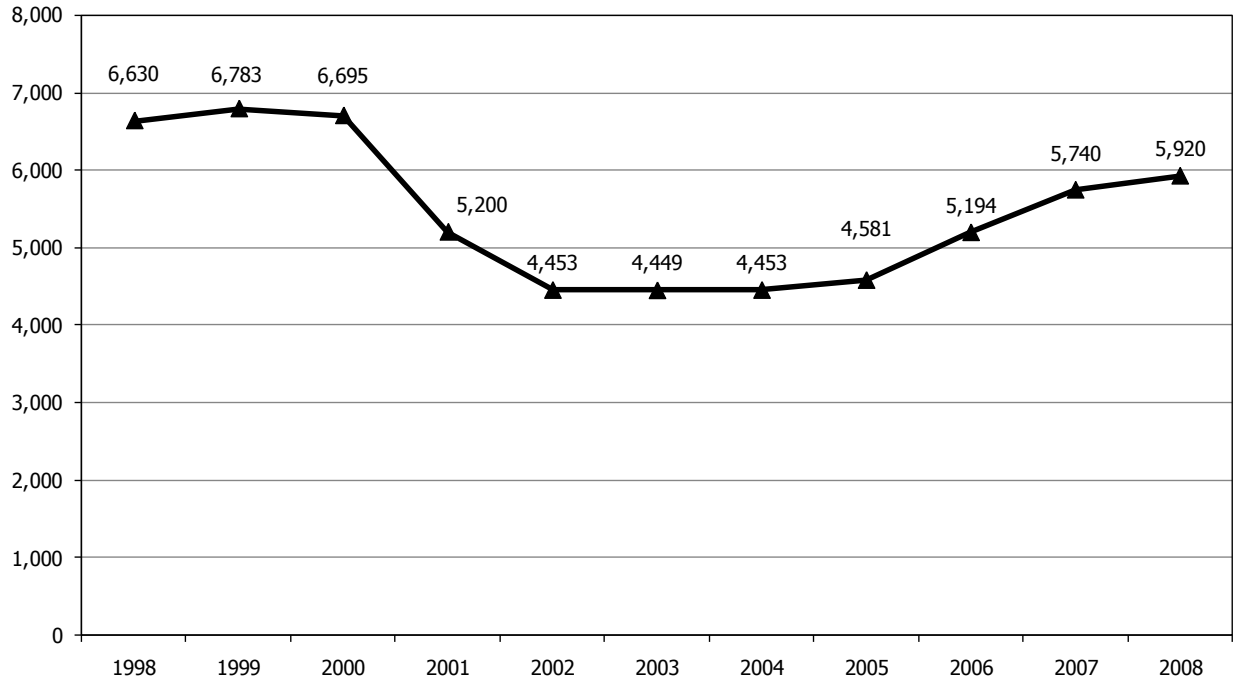


Student Data

Applicants

From fall 2000 to fall 2002, there was a substantial decrease in the number of U.S. applications to U.S. veterinary schools, but beginning in the fall of 2004, there has been a steady increase.

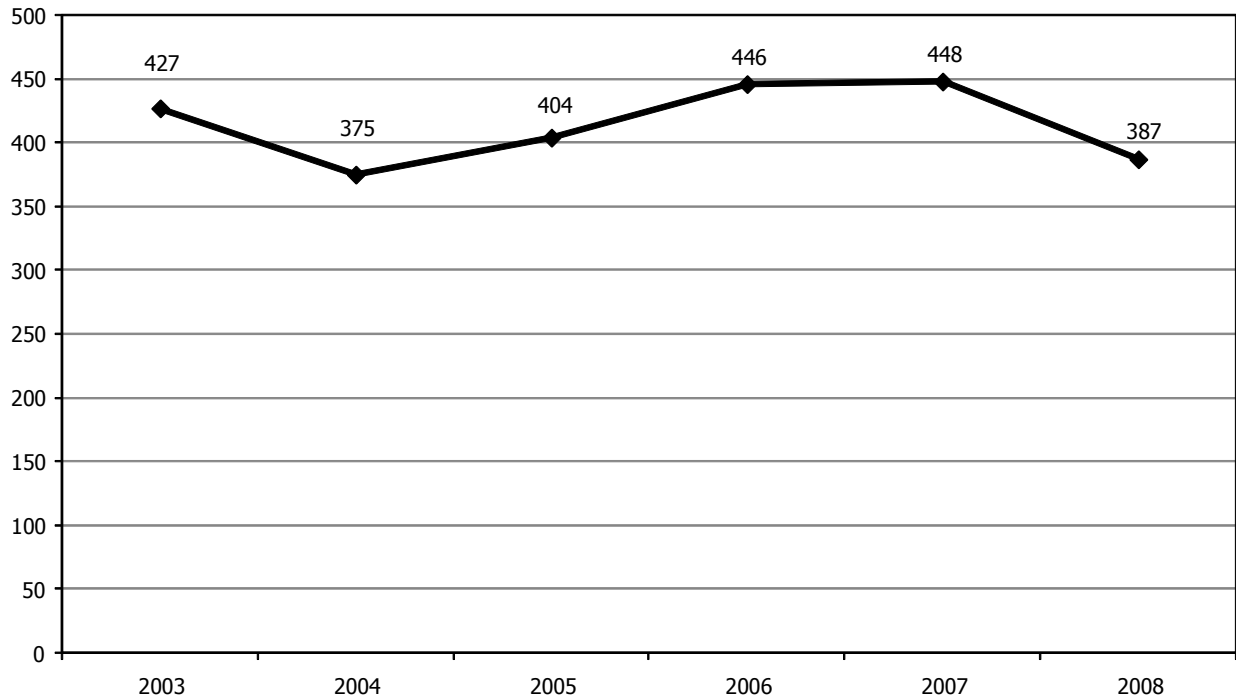
Applicants to U.S. Veterinary Schools



Source: Association of American Veterinary Medical Colleges.

Applicants to the Texas A&M University College of Veterinary Medicine dropped 12 percent from 2003 to 2004, but rose over 19 percent from 2004 to 2007. However, from 2007 to 2008, applicants decreased over 15 percent.

**Applicants to the Texas A&M University
College of Veterinary Medicine (Fall 2003-Fall 2008)**



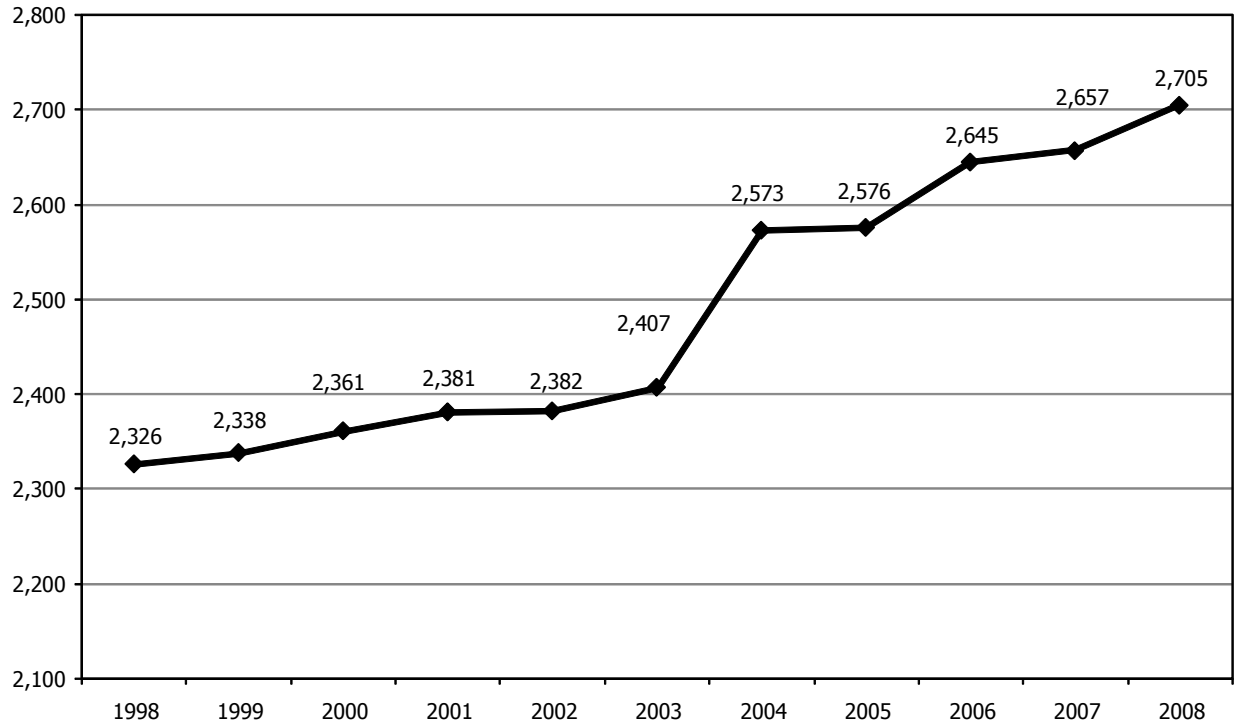
Source: TAMU College of Veterinary Medicine.

Application numbers are only given since 2003, since the figures before that time are inflated and misleading. In 2000, the Texas A&M University College of Veterinary Medicine withdrew from the Veterinary Medical College Application Service administered by the American Association of Veterinary Medical Colleges (AAVMC). This service made it easy for students to apply to more than one school at the same time for an extra \$20, and the average number of applications was 4.5 per candidate. As a result, there is heavy duplication in the number of applications received by schools while they subscribe to the service. In 2000, the TAMU College of Veterinary Medicine concluded that it would be more cost effective for students and the university to use the online application service already established by the Texas A&M Health Science Center. Several other schools dropped out of the VMCAS system around the same time, partially accounting for the drop in application numbers nationwide.

First-Year Entering Enrollment

Enrollment in U.S. Veterinary Schools has steadily increased over the last 10 years.

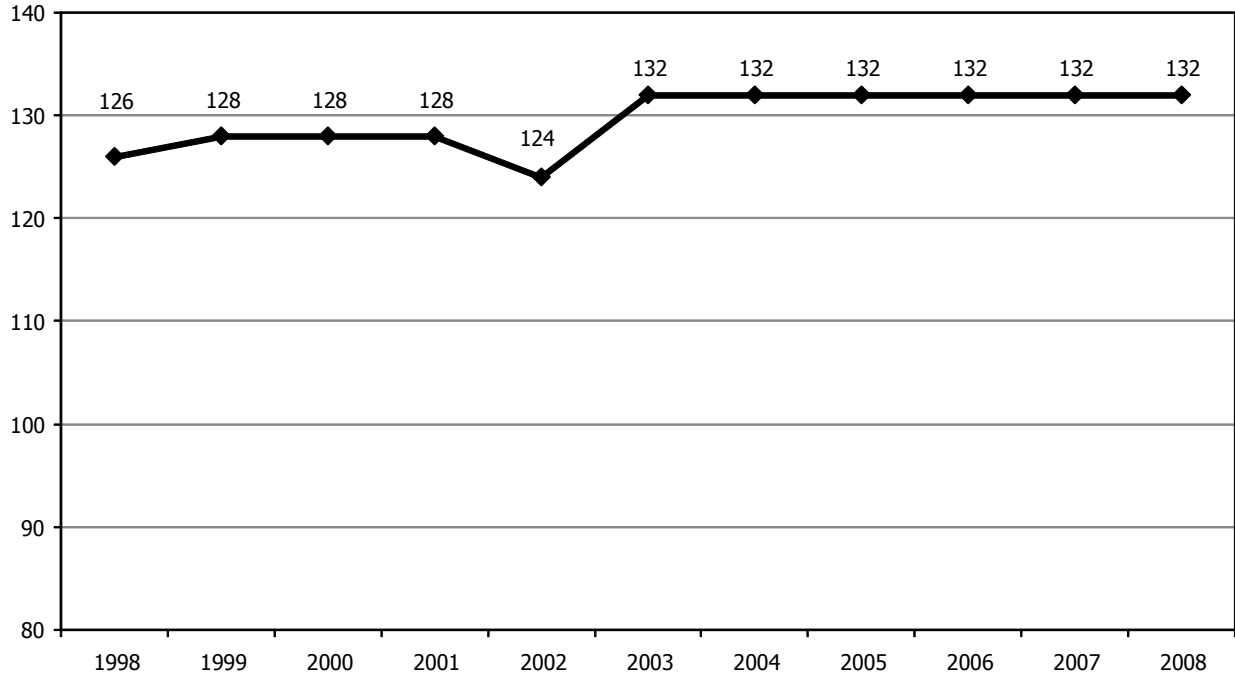
First-Year Entering Enrollment in U.S. Veterinary Schools



Source: Association of American Veterinary Medical Colleges.

In 2003, the Texas A&M University College of Veterinary Medicine increased its capacity, and enrollments have remained constant ever since.

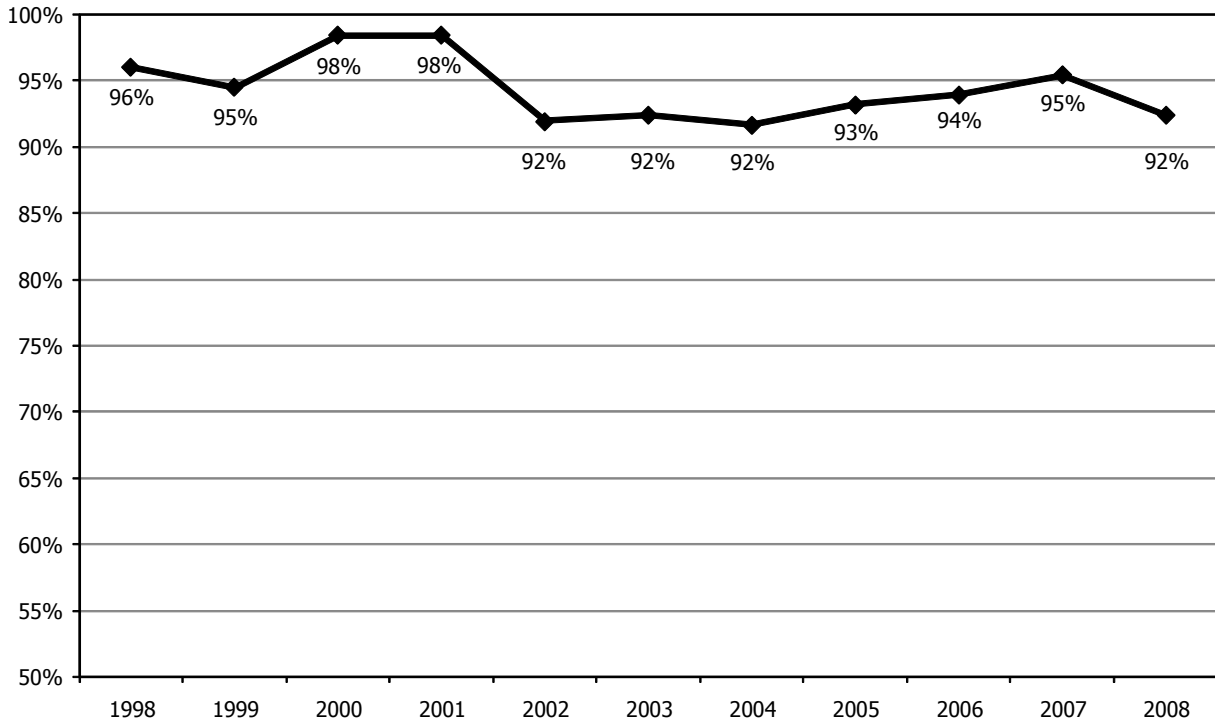
**First-Year Entering Enrollment
to the Texas A&M University College of Veterinary Medicine**



Source: TAMU College of Veterinary Medicine.

The Texas A&M University College of Veterinary Medicine accepts very few out-of-state students. This table shows the percentages of in-state students.

**First-Year Entering Enrollment from Texas
in the Texas A&M University College of Veterinary Medicine**

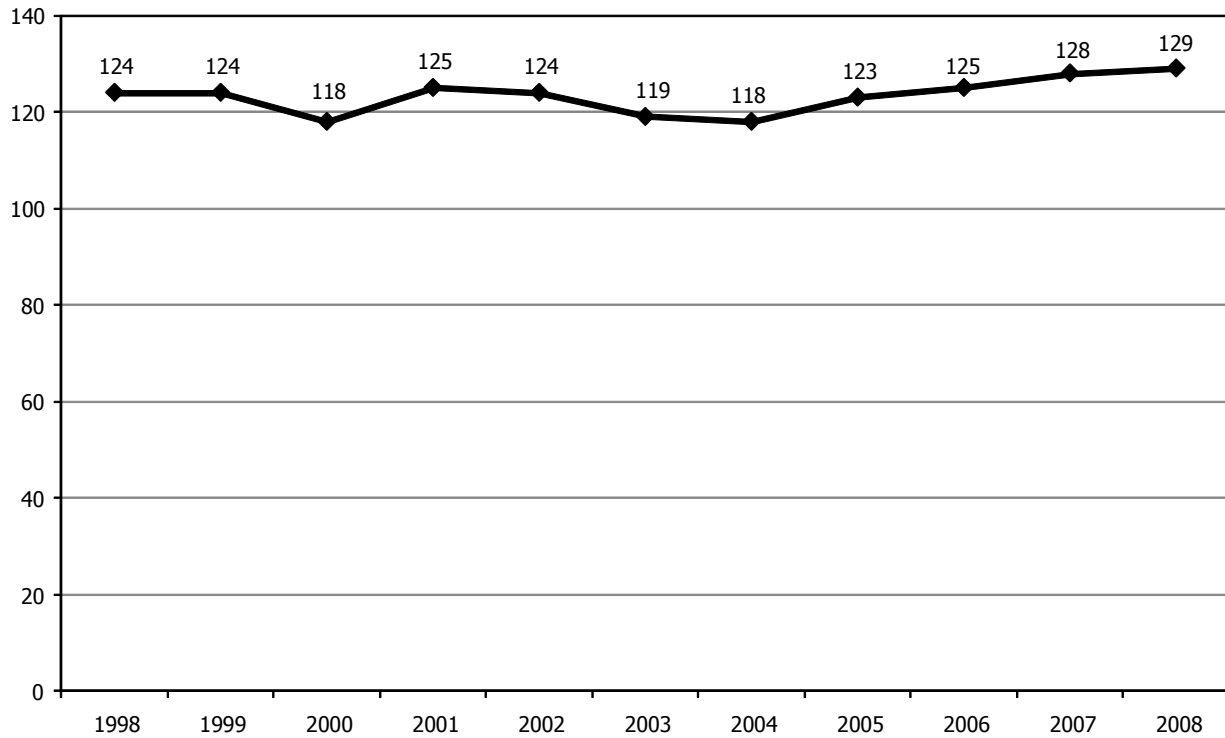


Source: TAMU College of Veterinary Medicine.

Graduates

The 4 percent attrition rate at the Texas A&M University College of Veterinary Medicine is relatively low, and the number of graduates has been steady during the last 10 years without any substantial cumulative increase or decrease.

The Texas A&M University College of Veterinary Medicine Graduates

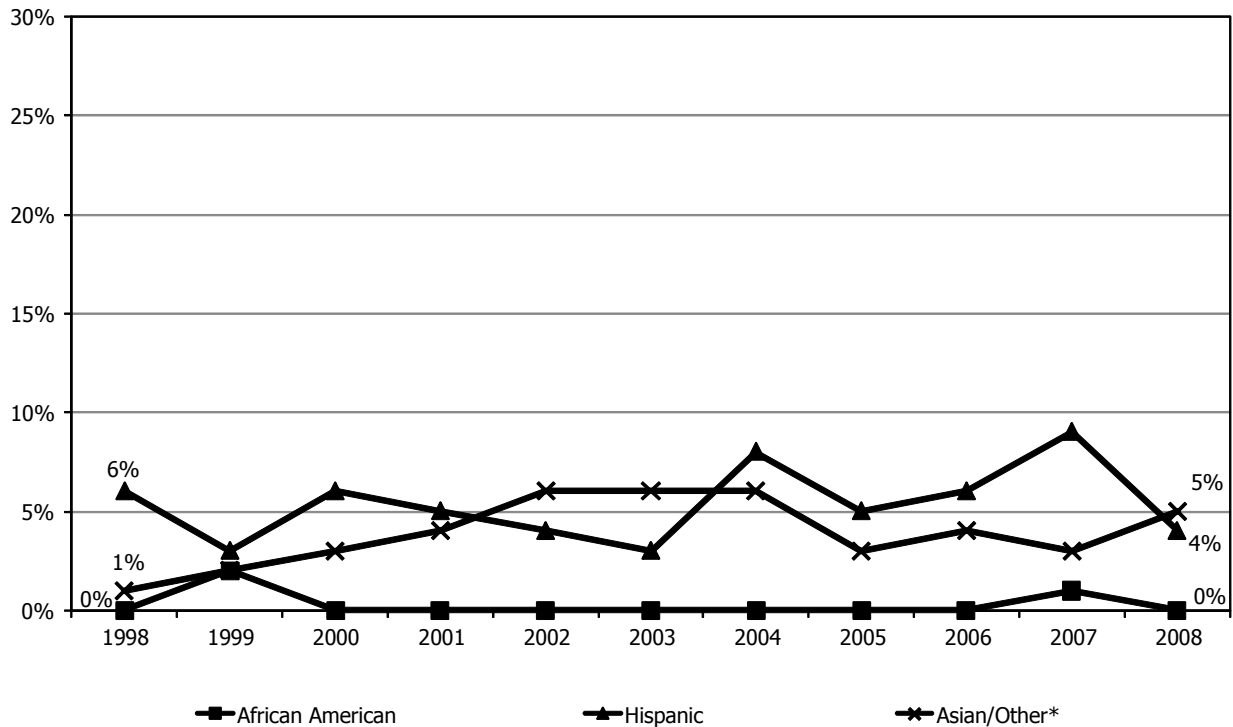


Source: TAMU College of Veterinary Medicine.

Minority populations are poorly represented in veterinary schools nationwide and in Texas. The percentages fluctuate between 0 and 9 percent, but the Asian/Other population is the only one that has made cumulative gains over the last 10 years. African Americans are the most seriously under-represented group.

The Texas A&M University College of Veterinary Medicine does not keep data on the ethnic breakdown of its applicants. There is data that divides all applicants into "white" and "combined minority" categories, with students self-identifying their ethnicity and 1-7 percent declining to answer. Based upon available data, the TAMU College of Veterinary Medicine accepts and graduates approximately half the number of "combined minority" applicants who apply. Over the last two years, "combined minority" applicants have peaked at 20-22 percent.

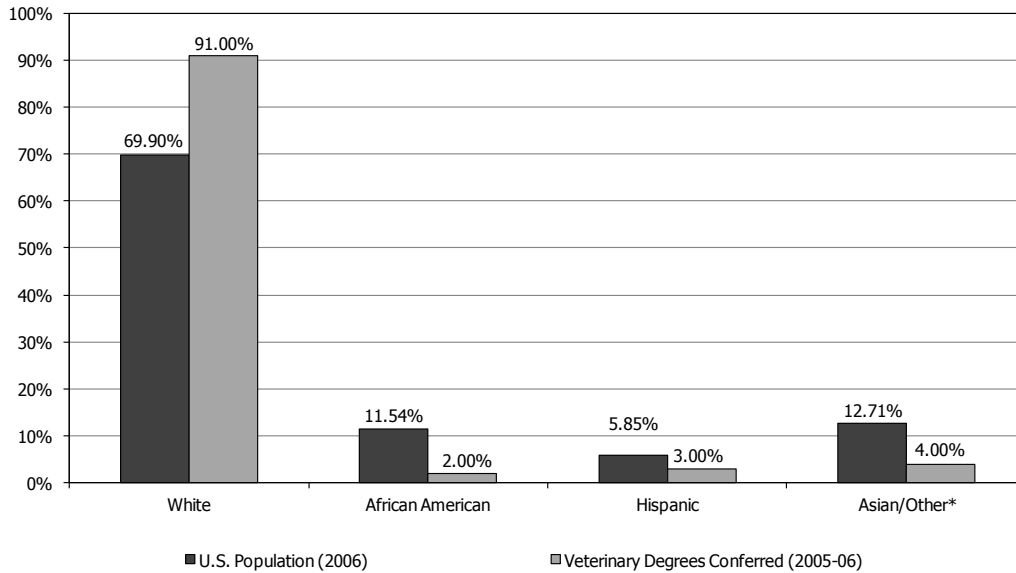
The Texas A&M University College of Veterinary Medicine Graduates by Ethnicity



Source: TAMU College of Veterinary Medicine.
 *"Other" includes Native American, International, and Unknown.

The Hispanic and African American populations are significantly under-represented among the graduates of U.S. veterinary schools and at the Texas A&M University College of Veterinary Medicine.

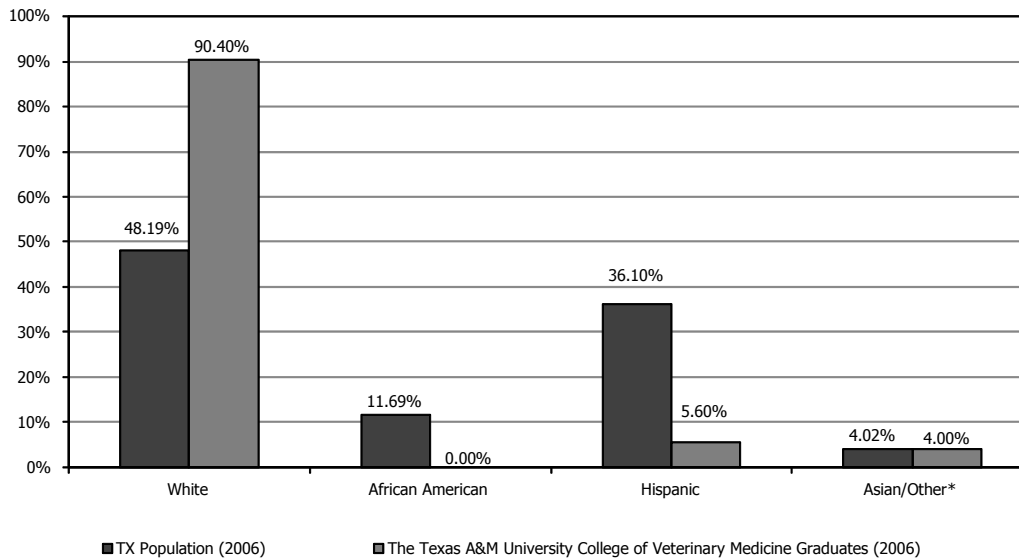
Comparison of U.S. Population and U.S. Veterinary School Graduates by Ethnicity (2006)



Sources: U.S. Population: U.S. Census Bureau. Veterinary Degrees Conferred: National Center for Education Statistics.

**Other" includes Native American, International, and Unknown.

Comparison of the Texas Population and the Texas A&M University College of Veterinary Medicine Graduates by Ethnicity (2006)



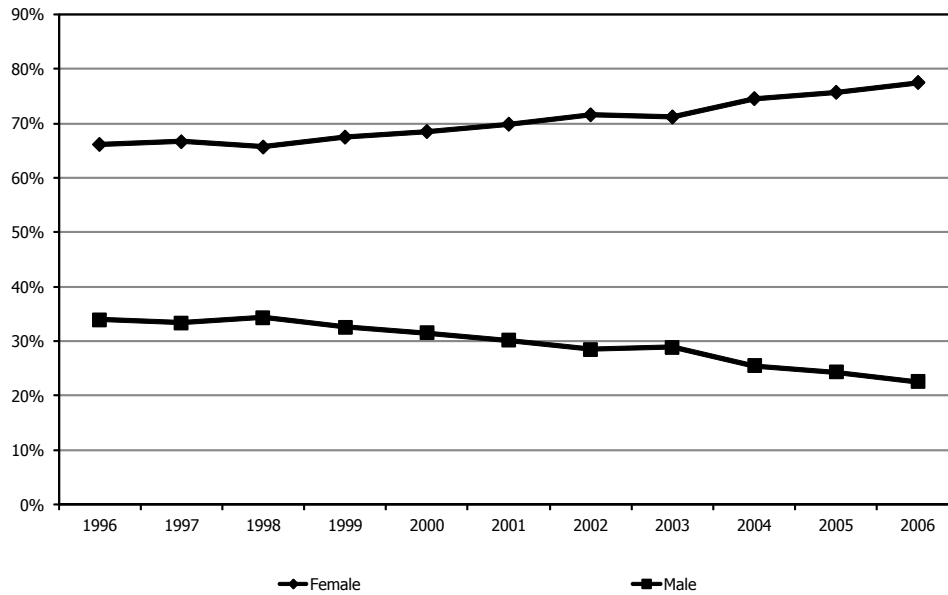
Sources: Texas Population: Texas Department of State Health Services. Graduates: TAMU College of Veterinary Medicine.

**Other" includes Native American, International, and Unknown.

Gender

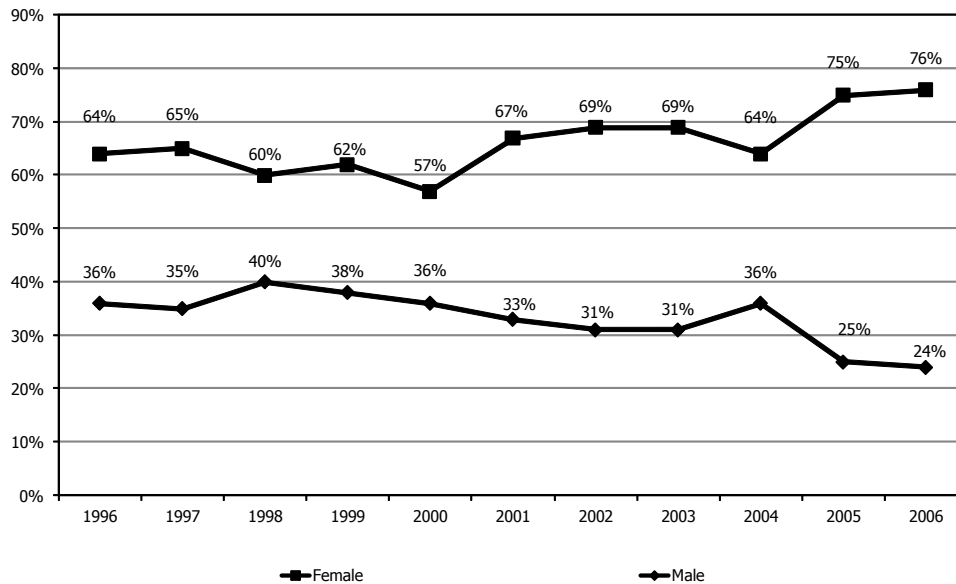
Since spring 1998, the percent of women earning veterinary degrees in U.S. veterinary schools has steadily increased. The trend at the Texas A&M University College of Veterinary Medicine is very similar. Veterinary medicine has recently become one of the few science-oriented fields where women are sustaining a significant majority nationwide.

U.S. Veterinary Degrees Awarded by Gender



Source: National Center for Education Statistics.

The Texas A&M University College of Veterinary Medicine Degrees Awarded by Gender

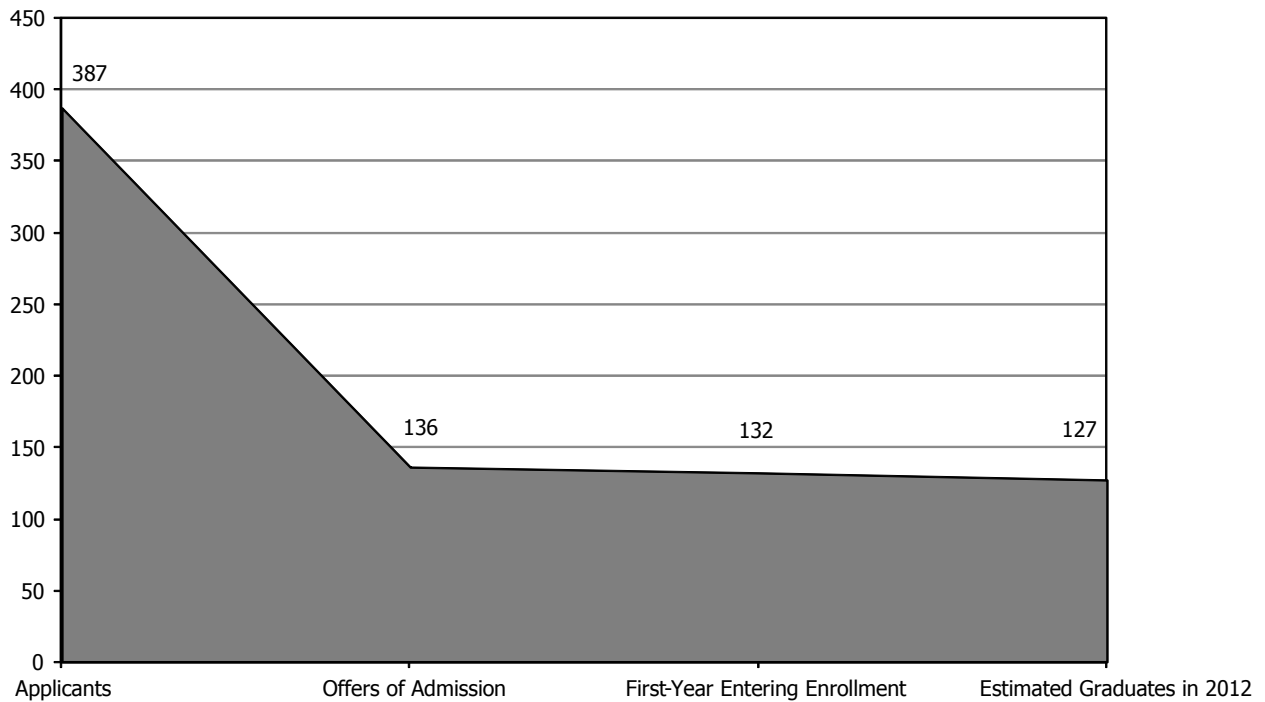


Source: TAMU College of Veterinary Medicine.

Educational Pipeline

Admission to the Texas A&M University College of Veterinary Medicine is highly competitive, and almost all entering students graduate. Based upon a 10-year (1998-2008) average attrition rate of 4 percent, 96 percent of the class of 2012 at the Texas A&M University College of Veterinary Medicine is expected to graduate.

Educational Pipeline to Obtaining a Veterinary Degree in Texas (2007-2008)

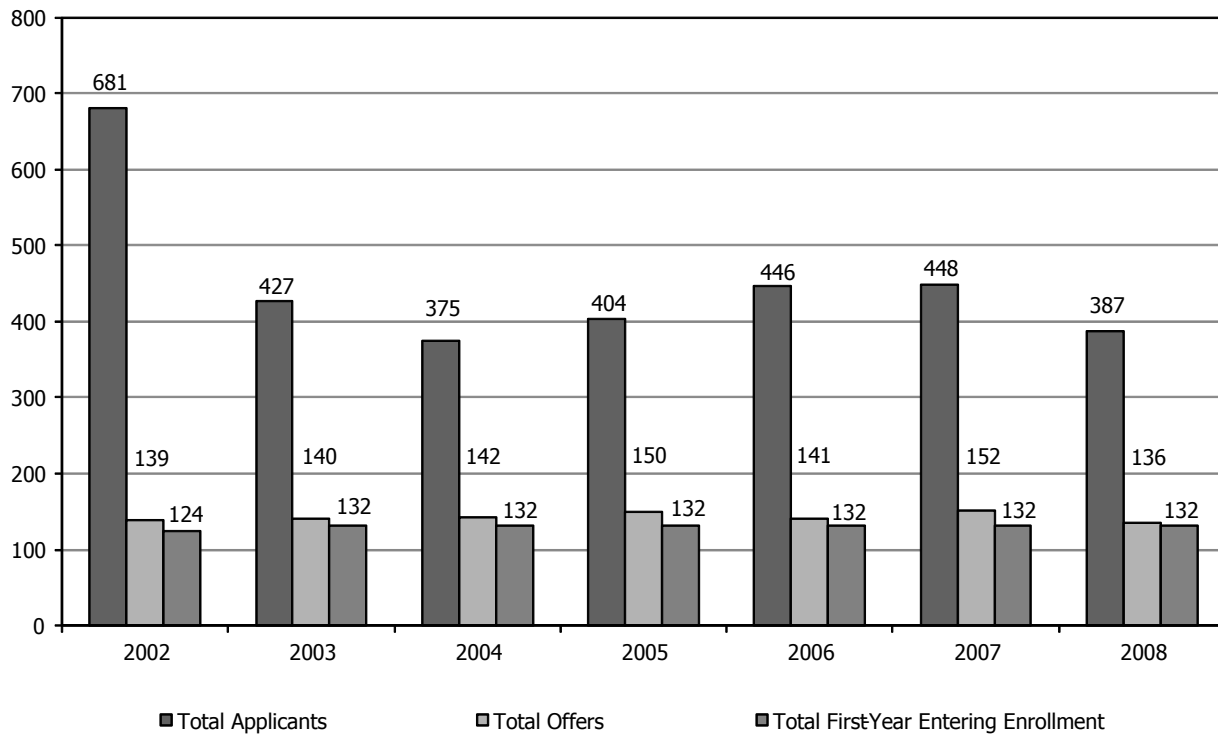


Sources: Applicants, Offers of Admission, and First-Year Entering Enrollment: TAMU College of Veterinary Medicine.
Estimated Graduating Students 2012: Texas Higher Education Coordinating Board.

Note: Degree estimate is based upon an attrition rate of 4 percent, which is the current average attrition for Texas veterinary students.

Applications to the Texas A&M University College of Veterinary Medicine went down when the institution transitioned away from the AVMA multiple-application system in 2002. Applications for the most recent year are down for the first time since 2004, but there are still almost three times as many applicants as there are available seats. The Texas A&M University College of Veterinary Medicine has sustained a very high acceptance rate.

Applicants, Offers, and First-Year Entering Enrollment to the Texas A&M University College of Veterinary Medicine (2002-2008)

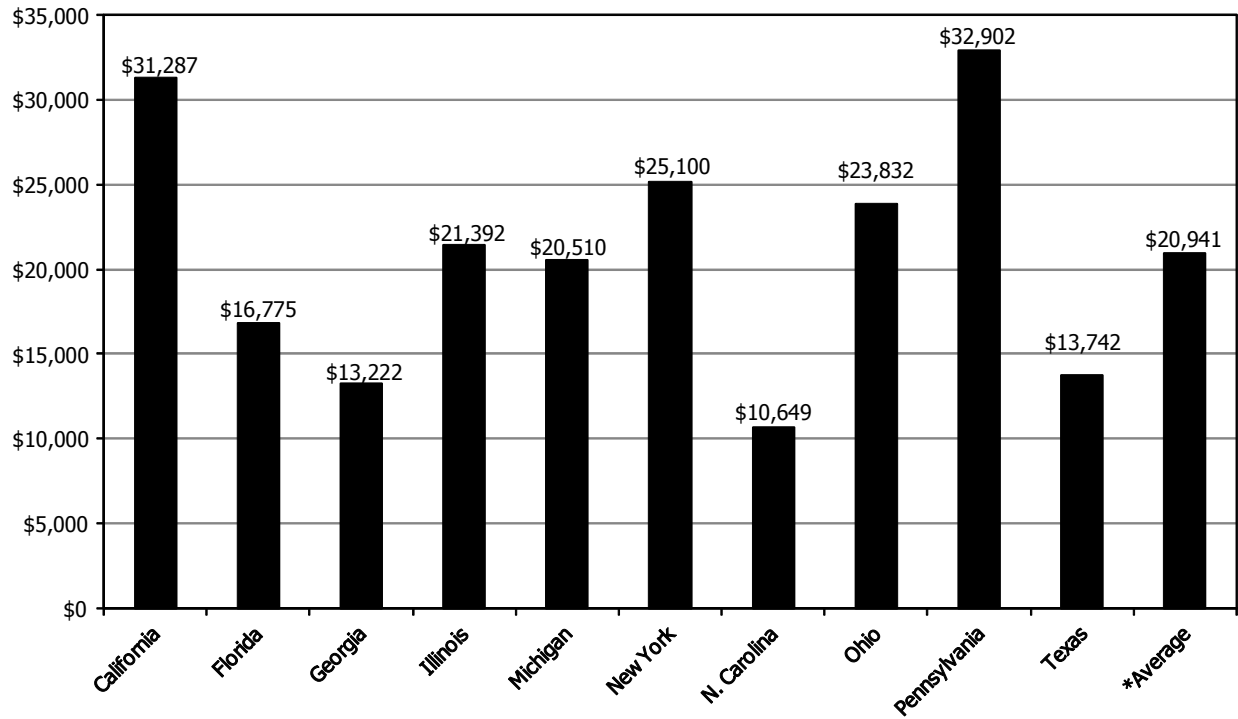


Source: TAMU College of Veterinary Medicine.

Tuition and Fees

Resident tuition and fees at the Texas A&M University College of Veterinary Medicine are below the average resident tuition and fees for veterinary schools in the 10 most populous states.

**Average Veterinary School Tuition and Fees
in the 10 Most Populous States (2008-2009)**



Source: TAMU College of Veterinary Medicine.

*Average is for the 10 most populous states.

Opportunity

The Metroplex has the highest percentage of students attending the Texas A&M University College of Veterinary Medicine, while the Upper Rio Grande area has the lowest. Representation of the various regions of Texas in the Texas A&M University College of Veterinary Medicine is generally proportional.

Comparison of the Texas Regional Population and the Texas A&M College of Veterinary Medicine Student Population (2007)

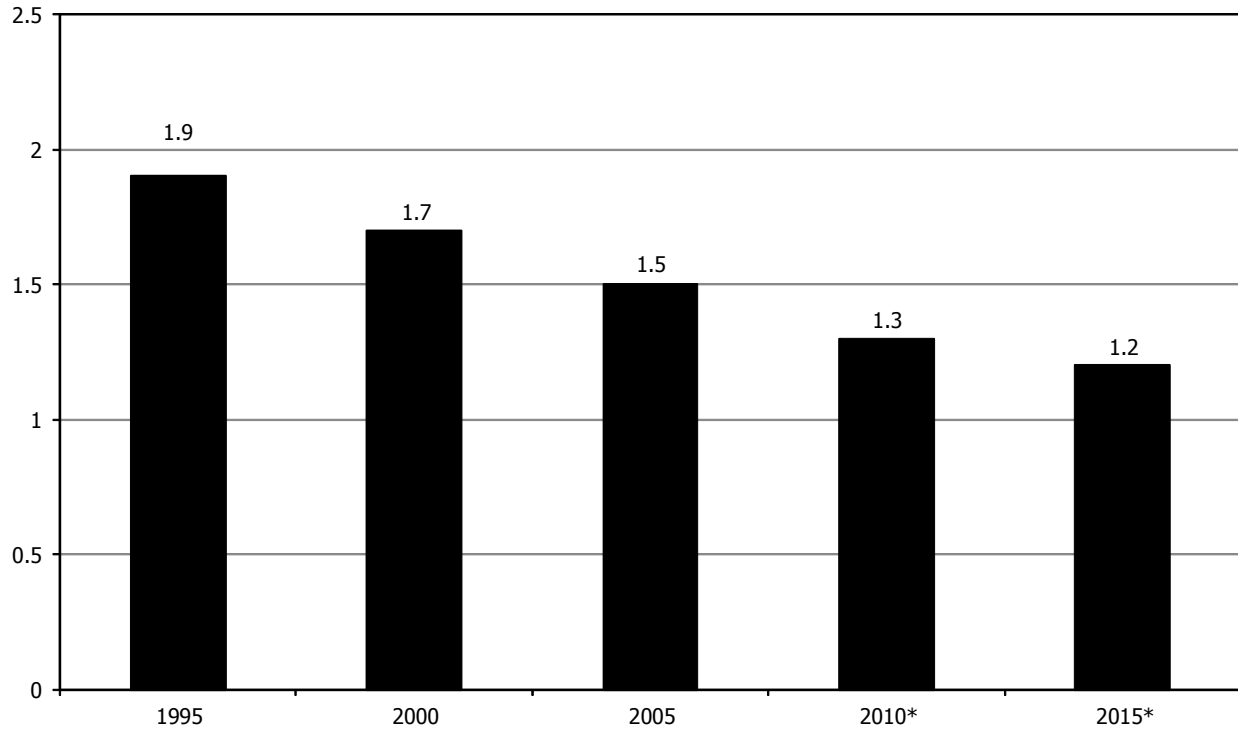
Regions	Texas Population	Percent of Veterinary Student Population*	Percent of Texas Population	Percent Difference
High Plains	833,764	3.2%	3.6%	-0.4%
Northwest	567,635	2.3%	2.4%	-0.1%
Metroplex	6,226,815	25.7%	26.8%	-1.1%
Upper East Texas	1,069,458	4.8%	4.6%	0.2%
Southeast Texas	777,670	1.9%	3.3%	-1.4%
Gulf Coast	5,436,942	24.6%	23.4%	1.2%
Central Texas	2,621,139	17.5%	11.3%	6.2%
South Texas	4,380,974	16.0%	18.8%	-2.8%
West Texas	552,621	2.9%	2.4%	0.5%
Upper Rio Grande	792,899	1.1%	3.4%	-2.3%
Total Population	23,259,917	100.0%	100.0%	- - - - -

Sources: Texas Population: Texas State Demographer. Veterinary Student Population: TAMU College of Veterinary Medicine.

*Represents self-reported county of origin data.

The opportunity for Texas residents to attend the Texas A&M University College of Veterinary Medicine is measured by calculating the ratio of the number of veterinary medicine school seats available in Texas to the total number of bachelor's degrees awarded in the state. Competition for admission is rising while student opportunity to attend veterinary school in Texas is declining.

**First-Year Entering Veterinary School Slots in Texas
per 1,000 Baccalaureate Degrees**



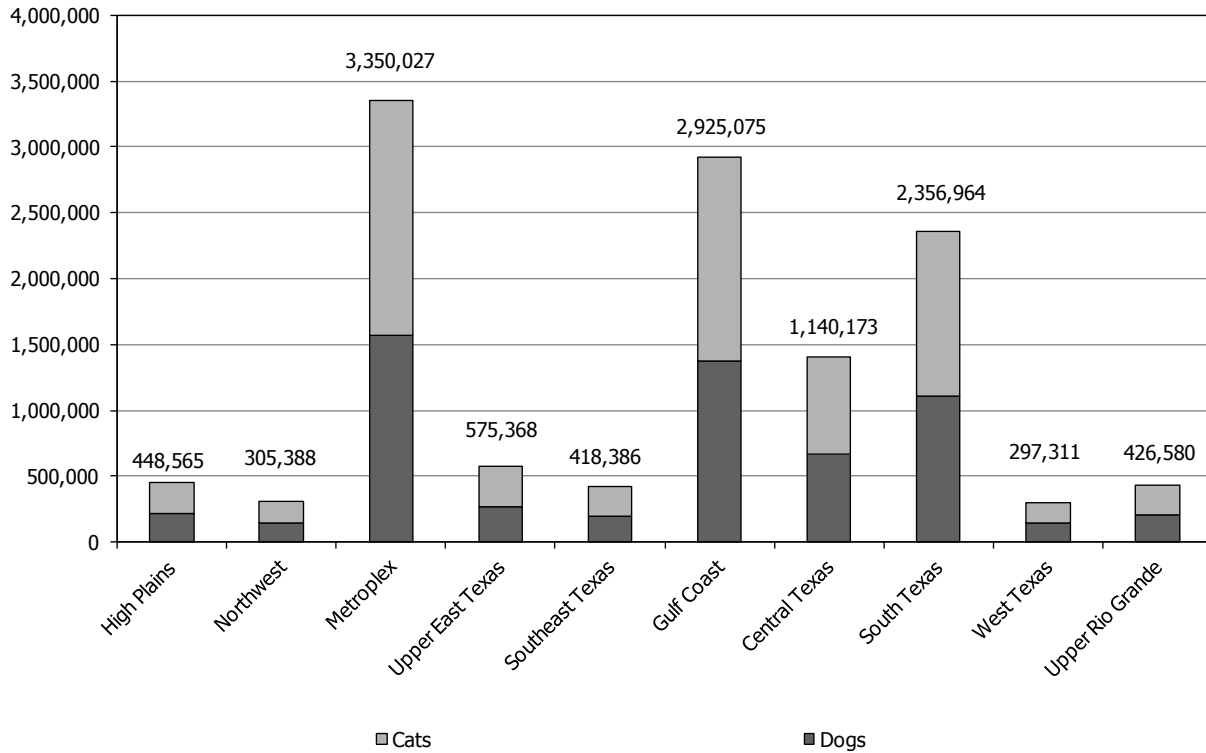
Source: Texas Higher Education Coordinating Board.

*Projected data.

Animal Information

The estimated number of cats and dogs in a region corresponds to that region's human population. According to the U.S. Census Bureau, there is an average of 2.5 people per household. The American Veterinary Medical Association estimates that there is an average of .632 dogs per household, and an average of .713 cats per household.

Small Animals by Texas Region (2007)



Source: American Veterinary Medical Association.

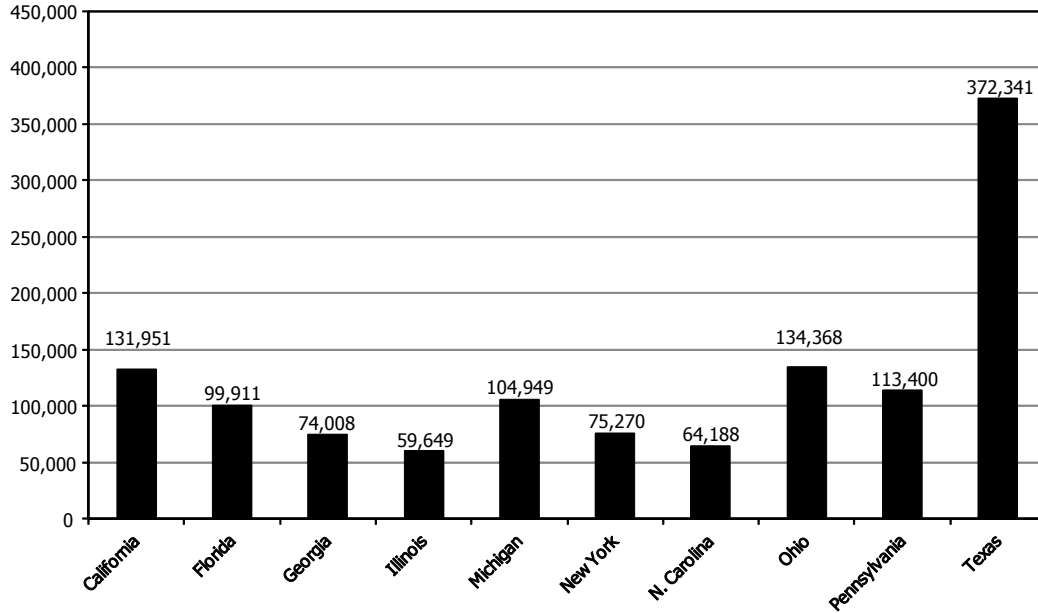
Small Animals by Texas Region (2007)

Region	Dogs	Cats	Total
High Plains	210,776	237,789	448,565
Northwest	143,498	161,890	305,388
Metroplex	1,574,139	1,775,888	3,350,027
Upper East Texas	270,359	305,009	575,368
Southeast Texas	196,595	221,791	418,386
Gulf Coast	1,374,459	1,550,616	2,925,075
Central Texas	662,624	747,549	1,410,173
South Texas	1,107,510	1,249,454	2,356,964
West Texas	139,703	157,608	297,311
Upper Rio Grande	200,445	226,135	426,580

Source: American Veterinary Medical Association.

Texas has almost three times as many horses as the other nine most populous states. Perhaps surprisingly, many of the state's horses are in the regions of Texas with large urban centers.

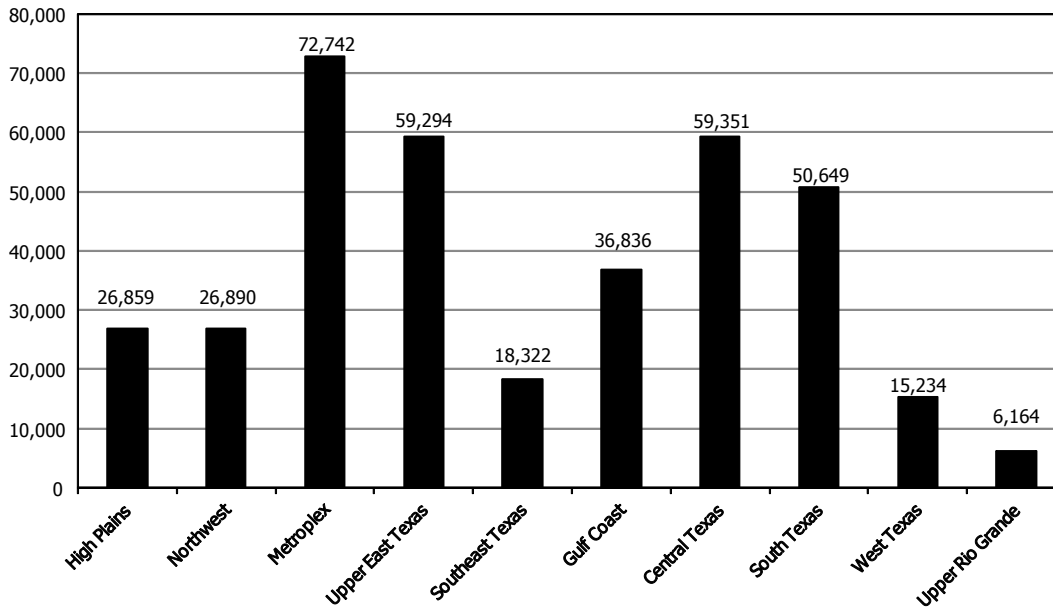
Horse Population in the 10 Most Populous States (2002)*



Source: U.S. Census of Agriculture.

*More recent data were unavailable.

Horse Population by Texas Region (2002)*

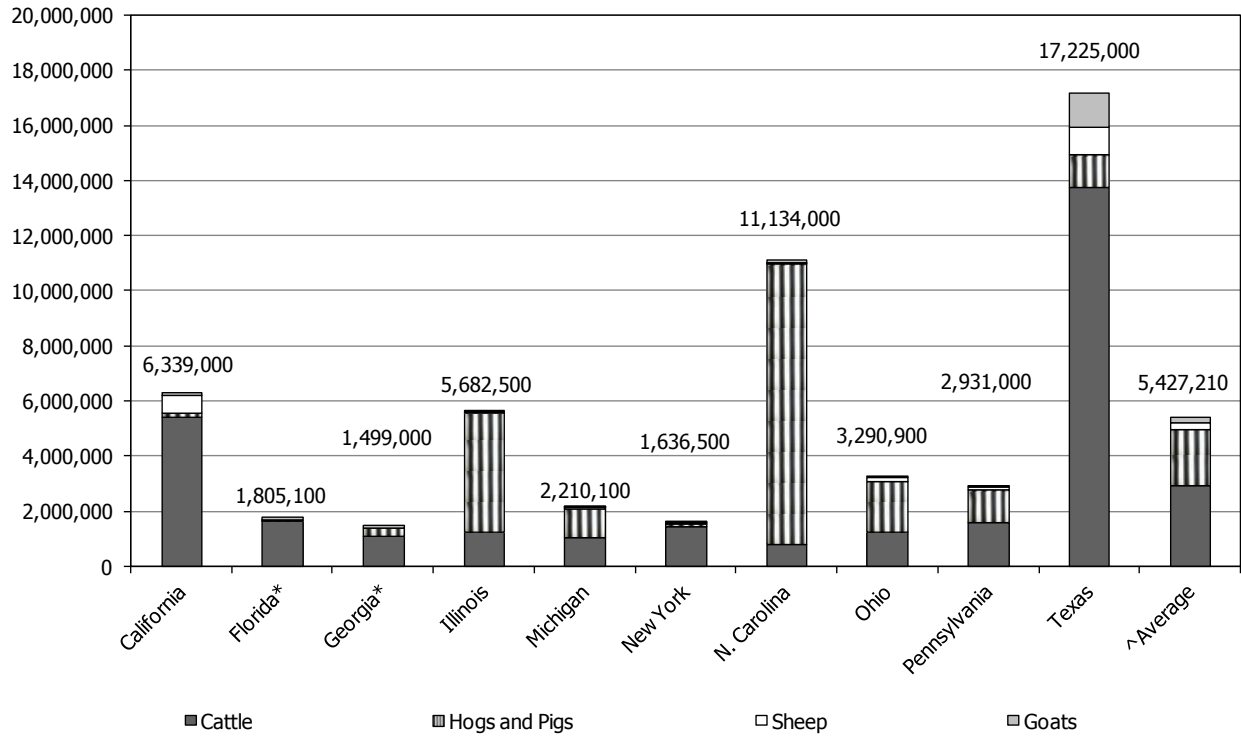


Source: 2002 U.S. Census of Agriculture.

*More recent data were unavailable.

Texas has more head of cattle than any of the other nine most populous states, and more than any other state in the country. ("Food and fiber" animals are those used for commercial, rather than companion, purposes. It excludes horses. For a full definition of the term, see Appendix A-4.)

Food and Fiber Animals in the 10 Most Populous States (2007)

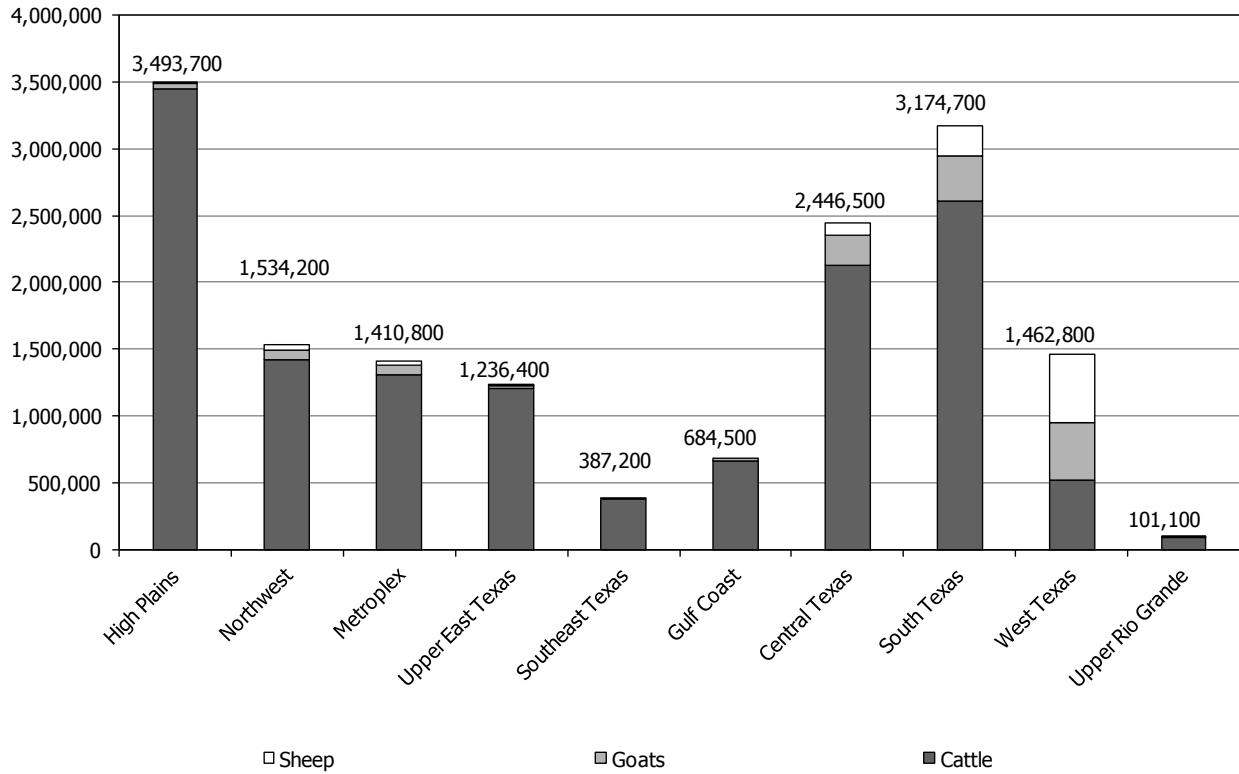


Source: U.S. Department of Agriculture - National Agricultural Statistics Services.

*Numbers of sheep for Florida and Georgia were unavailable.

Most of these cattle in Texas are concentrated in the High Plains, South Texas, and Central Texas regions.

Food and Fiber Animals by Texas Region (2007)

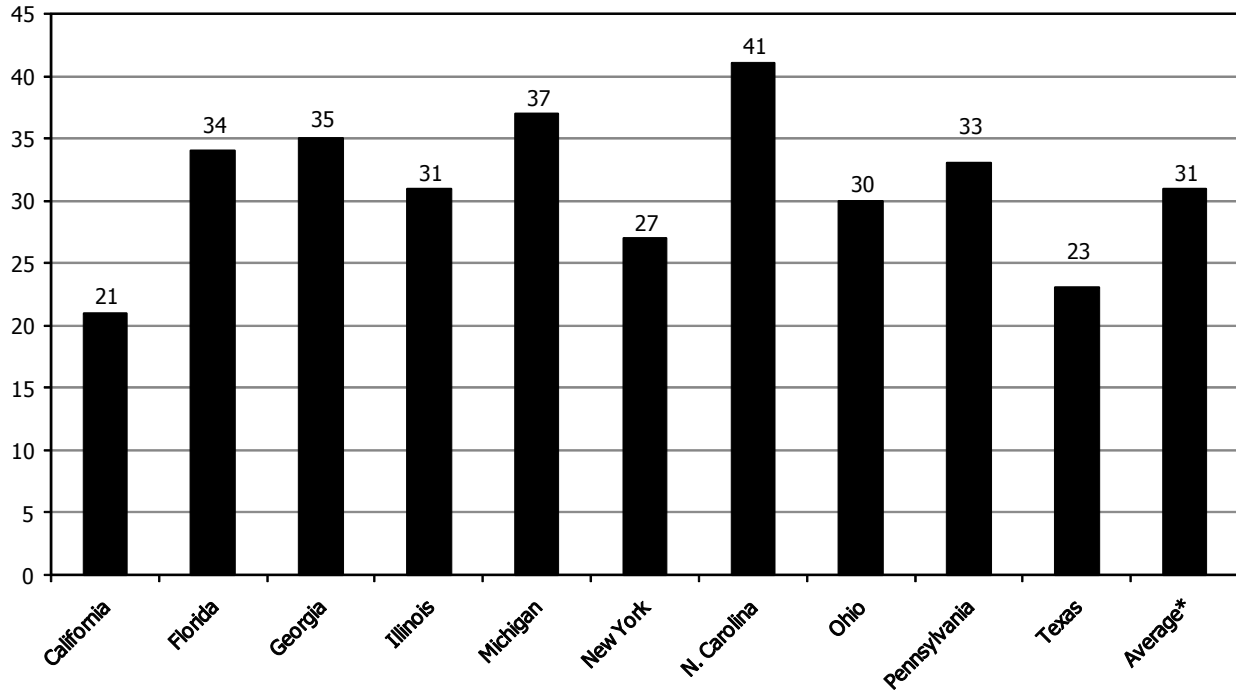


Sources: U.S. Department of Agriculture, and National Agriculture Statistics Services - Texas Field Office.

Workforce – Veterinarians in Practice

Texas is ninth among the 10 most populous states in the number of actively practicing veterinarians per 100,000 of the population. Among all of the states and the District of Columbia, Texas ranks 45th in the number of active veterinarians per 100,000 of the population (see Appendix A-5).

**Veterinarians per 100,000 Population
in the 10 Most Populous States (2007)**

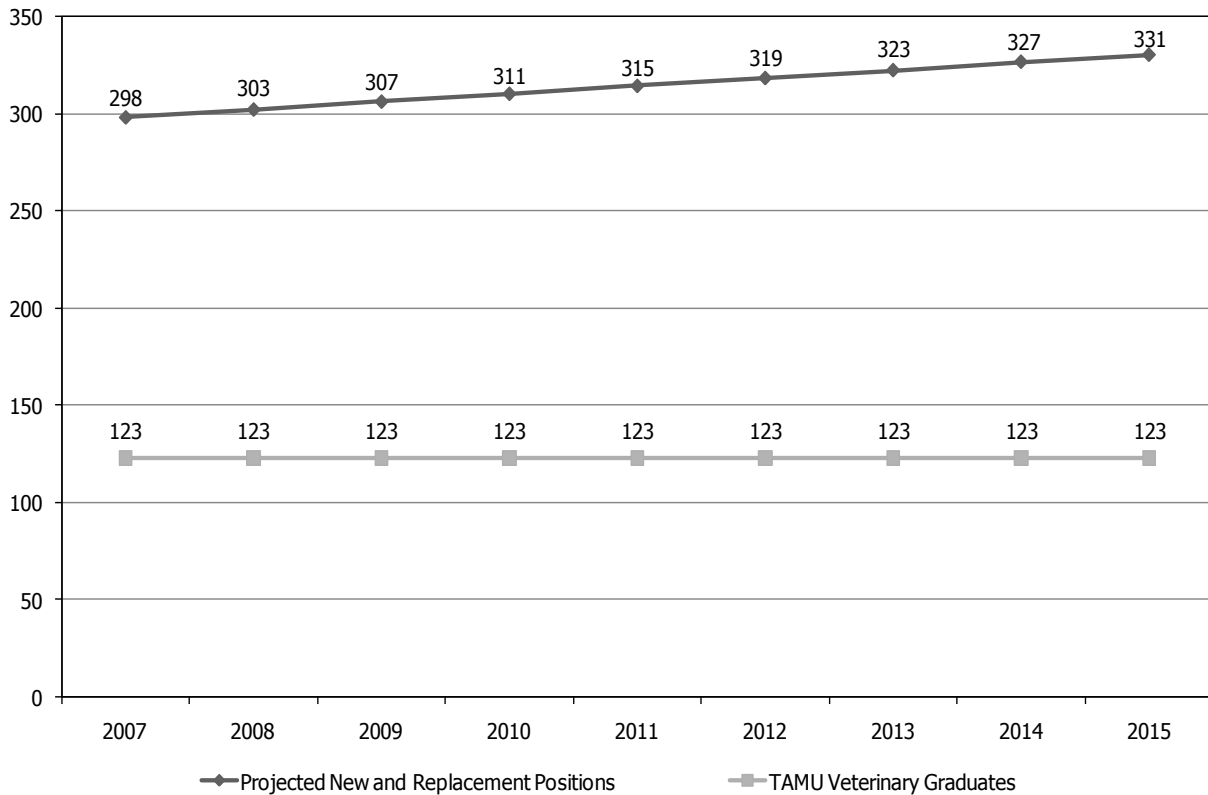


Sources: U.S. Census Bureau, and States' veterinary boards. Texas Population: Texas State Demographer. Average: Texas Higher Education Coordinating Board.

*Average is for the 10 most populous states.

The Texas Workforce Commission projects that the demand for veterinarians will increase by 18 percent to 2015. Nationwide, according to the Bureau of Labor Statistics, the demand is projected to increase at almost double that rate. There may be an even greater future need for veterinarians than indicated below, since the projections do not adjust for the baby boomers who are expected to retire over the coming decade. In 2007, Texas imported 1,668 veterinarians from other states. It may prove difficult to maintain this level of imported veterinarians if current trends continue, as only one new veterinary school has opened in the United States over the last 25 years. Enrollment at the TAMU College of Veterinary Medicine is currently at full capacity.

Comparison of Projected New and Replacement Positions to the Number of TAMU Veterinary Graduates



Sources: TAMU Graduates: Texas Higher Education Coordinating Board. New Positions: Texas Workforce Commission and Texas Veterinary Medical Association.

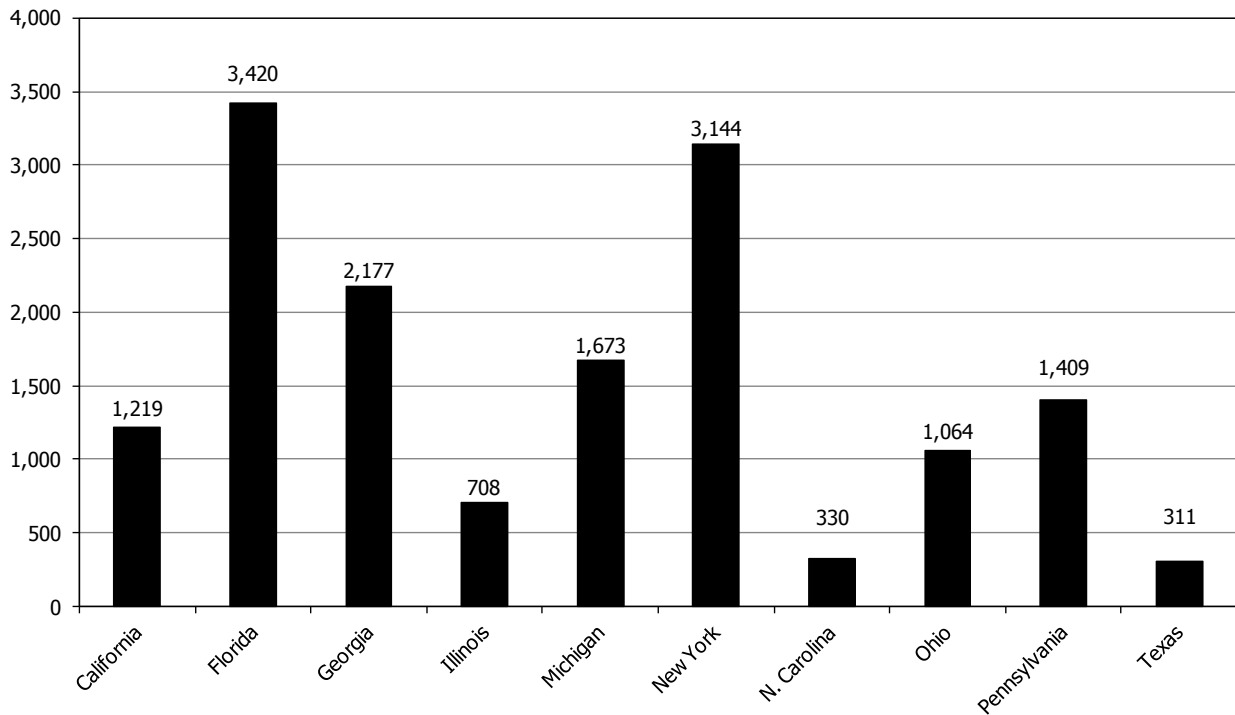
Ratio of Veterinarians to Texas Population

Year	Ratio
1985	1 : 5362
1991	1 : 4723
1994	1 : 4880
2000	1 : 4632
2005	1 : 4721
2010	1 : 4689
2015	1 : 4783

Sources: Population: Texas State Demographer. Graduates (1985-05): Institution. Veterinarians: Texas Department of State Health Services. Graduates and Veterinarians (2010-15): Texas Higher Education Coordinating Board.

Texas has more food and fiber animals than any other state, and Texas is last among the 10 most populous states in veterinarians per 1 million head. Texas has 11 times fewer veterinarians per 1 million food and fiber animals than Florida, the state with the highest ratio.

**Veterinarians per 1,000,000 Food and Fiber Animals
in the 10 Most Populous States (2007)**

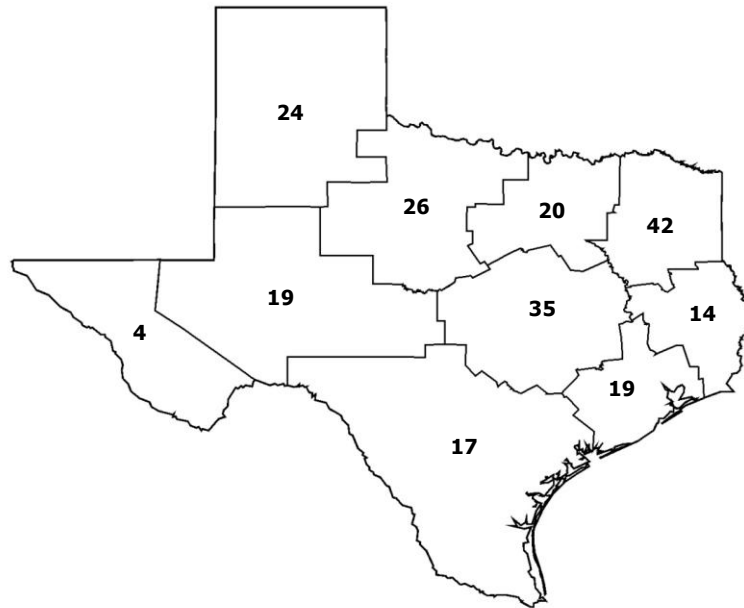


Sources: Food and Fiber Animals: U.S. Department of Agriculture- National Agricultural Statistics Services. Veterinarians: States' Veterinary Boards.

*Numbers of sheep for Florida and Georgia were unavailable.

There are wide disparities in the distribution of veterinarians across Texas. The Upper East Texas region has the highest number of veterinarians per 100,000 in the state (42), while the Upper Rio Grande region has the lowest (4). The Central Texas region includes College Station, home to the many licensed veterinarians associated with the Texas A&M University College of Veterinary Medicine.

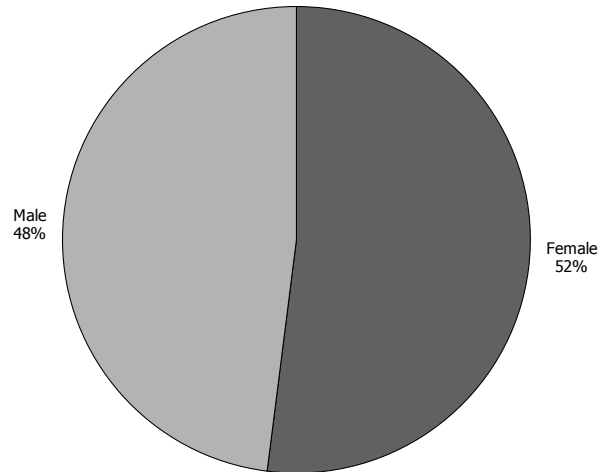
Veterinarians per 100,000 Population by Texas Region (2007)



Sources: Populations: Texas State Demographer. Veterinarians: Texas State Board of Veterinary Medical Examiners.

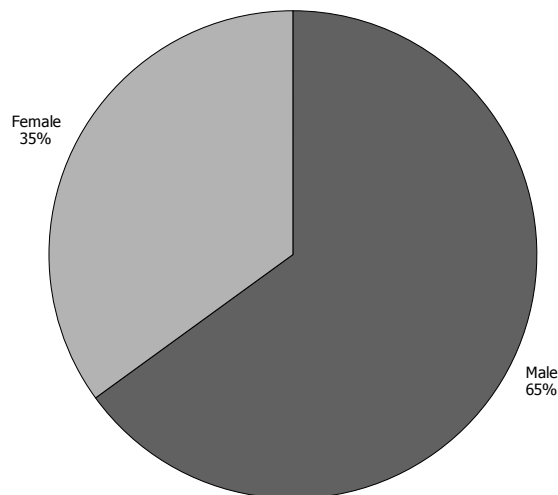
Texas has more male than female veterinarians than the national average. Demographics are likely to change in the coming decade, however, as the baby-boomer generation retires and is replaced by members of the majority-female graduating classes of American and Texas veterinary schools.

Veterinarians in the U.S. by Gender (2007)



Source: American Veterinary Medical Association.

Veterinarians in Texas by Gender (2007)



Source: Texas Veterinary Medical Association.

There are more small animal veterinarians than food and fiber, research, and equine veterinarians combined in every region of the state. Most large animals are cared for by mixed practice veterinarians, not those who identify food and fiber or equine animals as their primary specialty.

Veterinarians by Specialty by Texas Region (2008)*

Region	Small Animal	Food and Fiber	Research	Equine	Mixed Practice
High Plains	64	31	14	5	74
Northwest	48	10	2	5	57
Metroplex	1001	33	27	102	194
Upper East Texas	95	14	5	9	92
Southeast Texas	45	3	5	2	55
Gulf Coast	805	13	55	35	117
Central Texas	511	36	128	48	207
South Texas	380	21	52	23	186
West Texas	38	13	4	1	40
Upper Rio Grande	61	2	4	3	11
Total	3048	176	296	233	1033

*Self-reported data; duplication is likely, as a single veterinarian can report multiple specialties. See Appendix A-4 for a further breakdown of sub-specialties used to generate this table. Source: Texas State Board of Veterinary Medical Examiners.

SPECIAL ISSUES

Workforce Opportunities

There is virtually no unemployment among veterinarians in Texas, or nationwide. According to Texas Workforce Commission projections, there will be a demand for 18 percent more veterinarians up to 2014, while the Texas A&M University (TAMU) College of Veterinary Medicine is already at full capacity. Some of the areas of specialty that are expected to see particularly high growth over the coming decade in Texas include sport animal (i.e., racing horses and dogs) medicine, wildlife medicine, and exotic animal farming.

Nationwide, the Bureau of Labor Statistics estimates veterinary medical career opportunities to expand 35 percent until 2016, a rate much higher than the average for all occupations (7-13 percent). Small-animal practice in urban communities is expected to grow the fastest, although the best job prospects are for food and fiber animal practitioners in rural areas because competition (and salary) there is lower. Veterinarians with training in food safety and security, animal health and welfare, and public health and epidemiology should have the best opportunities for careers in state and federal government: these specialties are in demand because U.S. veterinary schools mainly prepare students for careers in private practice.

It is difficult to determine the exact number of job openings per year, since veterinarians can practice in any number of industries or varieties of private practice. Job advertisements in Texas are plentiful, but counting them for the number of actual openings is difficult since advertisements include multiple and repeated listings. Each TAMU College of Veterinary Medicine graduate receives an average of three job offers upon graduation, and those are just for jobs within Texas. According to the Texas Board of Veterinary Medical Examiners, there are currently 1,668 licensed veterinarians in Texas who did not graduate from TAMU. If that number is divided by a career length of 30 years, then hypothetically there is an average of 56 positions every year that could have been filled by a Texas resident (and that is assuming that the current workforce supply is sufficient to meet demand and not taking any projected growth into consideration).

Serious Shortage of Food and Fiber Veterinarians

The TAMU College of Veterinary Medicine was originally founded in 1916 to produce rural veterinarians, and to this day many students still enroll with the intention of being "cowboy vets." Annually, approximately one-third of the College of Veterinary Medicine's students come from rural counties with populations of under 100,000, and one-quarter of each class typically comes from counties with populations under 50,000. Four years ago, the College of Veterinary Medicine did an informal survey of its incoming students, and a majority indicated that they intended to be food and fiber (or large animal) veterinarians and to practice in a rural area. But by the end of the four years of veterinary study, most students had changed their minds and, years later, it appears that even fewer still have followed through with their early intentions. The trend is the same across the country: according to an AVMA survey, 19 percent of those who intend to have a food animal practice change their minds during veterinary school, along with 22 percent of those who intend equine medicine and 23 percent of those who intend to go

into mixed practice. A majority of those who switch go into companion animal medicine. These are the top 10 reasons cited by students deciding not to continue with food-animal practice:

1. New interests emerged after taking a variety of veterinary courses
2. Interactions with other students about original career area
3. Lack of flexible work hours in original career area
4. Poor balance between work and family in original career area
5. Heavy time demands from on-call in original career area
6. Too much time working evenings or weekends in original career area
7. Faculty mentor encouraged new area
8. Difficult to get time off for vacations in original career area
9. Not enough use of medical/surgical skills in original career area
10. Difficult to arrange time off for parental/family responsibilities in original career area

Other reasons for not practicing in rural areas, cited often in additional studies, include work opportunities for spouses, limited educational opportunities for children, lifestyle issues, physical demands of the work, and a desire to treat individual animals rather than entire herds.

The trends have serious implications for the future of veterinary medicine in Texas and around the country (and around the world—the problem is even worse in Europe and South America). Demand for beef is up along with demands for a healthier and safer food supply. However, according to the American Veterinary Medical Association (AVMA), only 16 percent of American veterinarians currently work with food supply animals. Additionally, while demand for food and fiber veterinarians is expected to rise 12 percent by 2016, the supply of veterinarians shrinks 4-5 percent annually. According to Eldon White, chief executive officer of the Texas and Southwestern Cattle Raisers' Association, some ranchers have to schedule when to move their cattle depending upon the availability of the one food and fiber veterinarian serving the entire region of West Texas. Veterinary supply is certainly limiting the productivity of Texas ranchers, White claims. The shortage of veterinarians in rural areas not only affects small farming and ranch business, it also limits the opportunity for all residents of those rural counties to have their companion animals treated, since food and fiber animals are most often treated by "mixed practice" veterinarians.

The TAMU College of Veterinary Medicine has taken steps to directly address the problem. A task force of faculty was appointed to study the practice choices of DVM graduates and the distribution of veterinarians to food and fiber animal practice. The College expanded the bovine teaching herd at the Riverside campus, initiated three new courses on food animal and environmental health issues, enhanced externship programs for students to work directly with practicing food and fiber veterinarians, developed a faculty mentoring program for graduate students interested in food and fiber animal practice, started a rural practice job fair for graduates, and established a program for interested undergraduates and high school students to work with practicing rural veterinarians. Most of these initiatives began 2-4 years ago, so it is too early to tell if they are having a measurable impact on the number and/or distribution of food and fiber animal veterinarians.

The problem of the food and fiber veterinarian supply is a complex one, and it is not likely to be solved by any one group: academia, government, industry, or veterinarians. It is not just an economic problem of supply and demand, it is also a problem that involves issues of working

conditions, culture, rural lifestyles and opportunities, work ethics, tradition, and gender assumptions. It is going to take a sustained, willing partnership of all parties concerned to arrive at workable solutions over time.

Salary Differences and Hiring Trends

The primary obstacle in keeping veterinarians in food and fiber animal practice in Texas is salary. Ranchers are not able or willing to match or exceed the higher salaries that veterinarians can make in small-animal practice in urban areas. While a rancher will rarely break even paying \$100 for the treatment of a cow, there is virtually no limit on what a devoted pet owner or sports-animal investor will pay for treatments—sometimes up to \$5000 or more. Since new DVMs are leaving veterinary school with a national average debt of almost \$120,000, it is becoming harder to convince them to work longer hours for what they believe will be more difficult conditions for less salary than they could make in an urban small-animal practice.

Veterinarians study for four years to get their degree, the same amount of time as a medical doctor, but the median salaries between the two are very different. According to the AVMA, the median income for veterinarians in private practice (excluding research, industry, and academic veterinarians) was \$79,000 in 2007. Since the amount of time to degree completion and student debt are often similar, those for whom salary is a key consideration will often choose medical school over veterinary school.

While salary information specific to Texas is not available, the national data may help to alter some assumptions that students are making about their choice of practice. As seen in the graphs on the following page, small-animal veterinarians do make more money, on average, than food and fiber veterinarians during their crucial loan-paying first years in practice. Over time, however, the average salaries for career veterinarians who claim large-animal exclusive or equine practice actually reach the highest income bracket shared with those who claim companion-animal predominant practice. These well-paid, large-animal exclusive veterinarians are only 1 percent of the veterinary population, however, and most of them are likely “herd management consultants” hired by large food-processing corporations for research and planning rather than attention to individual animals. The veterinarians in private practice, treating cattle in rural areas, are most likely to report their specialty as “food animal predominant” or “mixed animal,” and together they are 10 percent of the veterinary population. The larger of these two groups, the mixed animal veterinarians who treat both cattle and household pets, earn the lowest average pay outside of non-profit work—a full \$6,000 less per year than the companion-animal exclusive veterinarians who are 44 percent of the veterinarian population.

First-Year Salaries of U.S. Veterinarians (2008)

	Percent of Total	Median Professional Income Before Taxes
College or university	0.2%	NA
Federal government	0.2%	NA
State or local government	0.1%	NA
Industry or commercial	0.3%	NA
Other/Unknown	0.3%	NA
Uniformed services	1.8%	76,667
Food Animal Exclusive	2.5%	76,207
Companion Animal Exclusive	31.5%	74,403
Companion Animal Predominant	7.6%	70,793
Food Animal Predominant	2.7%	66,471
Mixed Animal	9.3%	66,405
Equine	3.3%	49,925

All Employment Types **1,743**

Source: Journal of the American Veterinary Medical Association.

Overall Average Salaries of U.S. Veterinarians (2008)

	Percent of Total	Median Professional Income Before Taxes
Other/Unknown ^{1,2}	18%	N/A
Industry/Commercial	3.6%	\$133,000
Food animal exclusive	1.2%	\$91,000
Companion animal predominant	6.6%	\$91,000
Equine	4.0%	\$91,000
College or university	6.9%	\$91,000
Federal government	2.0%	\$91,000
State or local government	1.2%	\$91,000
Food animal predominant	4.6%	\$79,000
Companion animal exclusive	44.3%	\$79,000
Mixed animal	4.9%	\$73,000
Uniformed services	0.7%	\$73,000
Not-for-Profit	2.1%	\$67,000

Total Number of Positions Held by U.S. Veterinarians **87,946**

¹Includes active AVMA members (Regular, Recent Graduates, and Educational) and Non-members (Excludes non-members born prior to 1937 and non-members who received their veterinary degree prior to 1963).

²Veterinarians may hold multiple positions.

Source: American American Veterinary Medical Association.

Veterinary Technicians

Veterinary technicians have an important role in the overall shape of veterinary medical education in Texas, and they are expanding their presence in the Texas animal care workforce. There are three classifications: A Veterinary Technologist is a graduate of a four-year, AVMA-accredited bachelor degree program; a Veterinary Technician is a graduate of a two-year, AVMA-accredited program at a community college or university; and a Veterinary Assistant requires no degree and is usually trained on the job. They have a variety of duties, depending upon their level of education, ranging from anesthetist and laboratory technician to kennel cleaner. It is not strictly necessary to obtain a license to practice in Texas, but most Veterinary Technicians take the Registered Veterinary Technician exam for certification by the Texas Veterinary Medical Association in order to be eligible for more employment opportunities and a wider range of responsibilities.

Job opportunities are excellent for qualified applicants. The Bureau of Labor Statistics projects a 41 percent growth until 2016, much higher than the 18 percent average for veterinarians and for the average of all U.S. occupations during the same time period. Pet owners are becoming more affluent and are willing to pay more for their animals' care, and a very large majority of Veterinary Technicians work in private clinical practice.

In Texas, Veterinary Technology associate's degrees are currently offered at Sul Ross State University, Austin Community College, Cedar Valley College, the Houston Community College District, McLennan Community College, Midland College, Palo Alto College, Tomball College, and Weatherford College. In 2006-07, 247 degrees were awarded in Veterinary Technology by these institutions, approximately the same average number of annual job openings estimated by the Texas Workforce Commission until 2014.

There has been some discussion of whether or not a redefinition of the duties of a Veterinary Technician, or the creation of some new and more advanced variation of the job, could help relieve the pressure of not having enough food and fiber veterinarians in rural areas. Eldon White, C.E.O. of the Texas and Southwestern Cattle Raisers' Association, reports that some in the cattle industry believe the exceedingly high academic standards required for admission to veterinary school are precluding many interested and capable candidates from doing basic service as food and fiber animal caretakers. The idea of creating an advanced Veterinary Technician has been previously discussed and rejected at the TAMU College of Veterinary Medicine. Dean Richard Adams says these students would be just as likely as others to follow the same career trajectories toward the higher-paying and less demanding careers in urban/small-animal practice. The Texas Veterinary Licensing Act is also very specific about which practice duties are to be performed only by a licensed veterinarian.

Gender and Under-represented Groups

Gender

Veterinary medicine is remarkable and unique for an important reason: it has recently established itself as the one area of the sciences where women have a large, and now seemingly permanent, majority. Whereas the already low number of women in engineering and the physical sciences is remaining steady or declining, the rise in female enrollments in veterinary schools has been steep and steady. While just 5 percent of veterinary students were women in the 1960s, in 2006 they received 77 percent of all the U.S. veterinary degrees. In 2007, only 52 percent of practicing U.S. veterinarians were women, but this is likely to change over the coming decade as retirees are replaced with new graduates. In Texas, the student numbers are similar but the workforce numbers are not. At the TAMU College of Veterinary Medicine, 76 percent of the 2006 graduates were women, and in 2007, 35 percent of the practicing Texas veterinarians were women.

There has been a great deal of speculation as to why more women than men have been attracted to veterinary medicine in recent years. Some of the theories rely on economics and social data: women tend to prefer less time-intensive careers to make room for families, they are willing to work for less money than men (who tend to gravitate instead toward higher-paying human medicine), and more role models in the field create a snowball effect. Other theories are more speculative and occasionally evoke gender stereotypes.

The gender imbalance likely correlates to the imbalance between small-animal and large-animal veterinarians. From the early part of the 20th century when virtually all U.S. veterinarians were large-animal specialists and literally all of them were men, the ratio of small-animal veterinarians has risen with the ratio of women in the profession. In 2007, according to the AVMA, 53 percent of small-animal exclusive veterinarians are women, compared to 16 percent of food-animal exclusive veterinarians. There is a long-standing perception that large-animal work is too physically demanding for women. This perception may be changing, and gender distribution among veterinary specialties along with it, as recent technological advances are leveling the field. As University of California-Davis professor Carol Cardona says in a *Washington Post* article on the subject (April 27, 2008), "Everyone said [in 1990] that a woman isn't strong enough to handle a cow. Well, a man isn't either. A cow is 100 times stronger than a man and 100.5 times stronger than me. That's not a real argument." While certain procedures are and will always be physically limiting, such as needing long arms to reach deep into the birth canal of a cow, much of the work that used to require brute strength is made more accessible now by powerful new tranquilizers. "We call the tranquilizer Dormosedan 'the great equalizer,'" jokes the equine veterinarian Kristin Dietrich in the *Washington Post* article.

Under-represented Groups

Women have made significant gains in veterinary medicine, but under-represented ethnic groups (of all genders) lag far behind. African Americans and Hispanics are significantly under-represented in veterinary schools. Hispanics represent 36 percent of the Texas population but only 9 percent of the Texas veterinary graduates in 2007. African Americans make up 11 percent of the Texas population, but for nine of the last 11 years, there have been no African American graduates at the TAMU College of Veterinary Medicine. Nationwide, the picture is worse for Hispanics but only slightly better for African Americans: in 2005-06, Hispanics were 3 percent of the veterinary school graduates, and African Americans were 2 percent.

The TAMU College of Veterinary Medicine, like many other veterinary schools across the country, has made aggressive attempts to recruit under-represented groups. Academic counselors are sent out annually to urban areas across the state to recruit under-represented groups, and the acceptance rate of African Americans, Hispanics, and Asians who are offered positions at the TAMU College of Veterinary Medicine is very high.

Development of New Sites and Expansion of Existing Site

In 1971, the Texas Higher Education Coordinating Board issued a now-expired authorization for Texas Tech University to establish a school of veterinary medicine. There is still a desire among many at Texas Tech University to have a veterinary school, but no one has recently proposed a realistic way to generate the extensive initial funds that would be required. A school of veterinary medicine needs a veterinary hospital to train its students in clinical practice, and typically it costs more to build a hospital for animals than a hospital for humans. There is no simple way to calculate the cost of building an entirely new veterinary school, as much depends upon existing faculty, laboratory and library resources, available buildings, among other issues. However, Dean Richard Adams estimates it would cost between \$550 and \$750 million.

There are plans to open a new veterinary school at the University of the Incarnate Word if San Antonio is selected as the site for the Department of Homeland Security's proposed National Bio and Agro-Defense Facility. The Texas Research Park is one of five finalists, and the Department of Homeland Security is to make their decision in 2009. If established, the University of the Incarnate Word would have one of the very few private veterinary schools in the nation. No specific timetable or budget has yet been approved, so it is not likely to affect the supply of Texas veterinarians in the near future.

Expansion of the existing site at TAMU would be a more cost effective way of addressing the decreasing ratios of veterinarians to population over the next 10 years. There is no guarantee, however, that an increase in veterinary graduates will necessarily lead to more food and fiber veterinarians, which is the state's primary veterinary need at this time. If the TAMU College of Veterinary Medicine produces 60 more graduates, a majority of them may decide to go into small animal practice in urban areas. Even so, they will be contributing to a growing need in a field that the Bureau of Labor Statistics ranks the ninth-fastest growing profession (35 percent change) in the U.S. until 2016. But if expansion of the TAMU College of Veterinary Medicine targets students interested in food and fiber animal practice and if even two of them go into food and fiber animal practice in the Upper Rio Grande region, that will double the number of veterinarians currently there.

In order to accommodate 60 or more students a year, Dean Richard Adams states that the TAMU College of Veterinary Medicine would need new and upgraded classroom space for basic science courses. Some faculty are already teaching the same courses four times a semester to small groups of students limited by the size of the classroom space, which the faculty find inefficient and Dean Adams calls "a stress on intellectual enthusiasm." A new veterinary medical science building at TAMU would have the added benefits of providing more space to benefit the animal science major, which is one of the most popular at the university and a primary feeder program for the veterinary graduate school. Laboratory space is also an important consideration not only for faculty growth at the TAMU College of Veterinary Medicine, but also to maintain the faculty that are already there. New construction currently underway will add 24 new laboratories available to the College of Veterinary Medicine, but 37 new faculty members have been hired over the last four years. New faculty have been doubling-up in laboratories, and it has been cited as a reason for leaving by some of the faculty who have left over the last five years. The combined research grants these faculty took with them to other universities totals at least \$4 million in government and corporate research grants.

Based upon the costs of current construction projects, Dean Adams estimates that the cost of a new basic science building, including appropriately equipped laboratory space, would be between \$55 and \$65 million. An additional \$5 to \$10 million would be appropriate to extend the small-hospital facilities at the animal hospital in order to accommodate the clinical training of the new students.

Conclusions

No new veterinary school is recommended at this time. Texas is meeting the current demand for small-animal veterinarians, although their distribution across the state is uneven. The ability of Texas to continue meeting the veterinary demand for its expanding population depends upon the continued importation of almost one-third of its veterinary workforce from other states. This is in a context where enrollment at the TAMU College of Veterinary Medicine is already at full capacity, and the size of the average national graduating class has not changed in more than 20 years (AAVMC).

In the event that enrollment at the TAMU College of Veterinary Medicine is increased, a new basic science building would allow for expanded classroom space and sufficient laboratories for new and existing faculty. Depending upon the size of the enrollment increase, an expansion of the animal hospital may also be necessary to accommodate the clinical training of the new students.

Final decisions on whether or not to expand class sizes at the TAMU College of Veterinary Medicine should come after the Department of Homeland Security announces whether or not Texas is selected as the location for the proposed National Bio and Agro-Defense Facility. If San Antonio is going to be the site, administrators at both TAMU and the University of the Incarnate Word may both profit from consultations on how their expansion efforts and new building construction may best be targeted to address the new projected workforce needs.

Texas cattle ranchers are being limited by a serious shortage of food and fiber veterinarians, and it particularly affects small business owners who can least afford to bring in veterinarians from (or transport cattle over) long distances on short notice. There are limitations to what higher education can do to address the problem. The TAMU College of Veterinary Medicine has already established creative methods to encourage students to choose and remain in food and fiber animal practice, but salary differences among specialists in the workplace often end up determining the patterns of veterinary practice. The College of Veterinary Medicine should be offered the resources necessary to continue and expand their existing efforts to promote food and fiber animal practice, particularly in rural areas.

One such effort which would likely make a direct and positive impact, both on the supply of rural veterinarians and the recruitment of badly needed students from under-represented populations, is a forgivable loan of up to \$25,000 a year payable to students who do large-animal practice for non-corporate clients in a rural community. Eight other states have adopted loan forgiveness programs, and eight more are considering similar legislation. A federal Veterinary Medical Service Act, providing loan forgiveness for students agreeing to work in underserved areas, was signed into law in 2003 but has not been funded.

Recruiting students from under-represented populations should remain a top priority for the TAMU College of Veterinary Medicine, although it should be recognized that there is a severely limited pool of applicants in Texas and across the nation. The number of out-of-state students admitted at the TAMU College of Veterinary Medicine is very small—between 2 and 8 percent. If class sizes are increased, this percentage of out-of-state students could be expanded with little or no impact on the existing opportunity for Texas students to get a veterinary education. This would allow the TAMU College of Veterinary Medicine to increase its national profile at the same

time it competes more aggressively for the nationwide applicant pool of under-represented populations. A targeted forgivable loan program would be one tool to recruit candidates from under-represented populations who may not otherwise be able to attend veterinary school. Also, the American Association of Veterinary Medical Colleges sponsors an annual conference, the Iverson Bell Symposium, on the theme of diversity in the veterinary profession. It is a forum for hearing the latest research on best practices around the country for recruiting under-represented populations, and representatives from the TAMU College of Veterinary Medicine should consider attending.

Increased funding for the TAMU College of Veterinary Medicine should begin with the baseline of the Coordinating Board's recommended level of formula funding for 2010-11. Currently, the state provides public veterinary schools with \$840.44 per semester credit hour, and the Coordinating Board recommendation is \$1,001.07. Increased support from the state should come with the recognition that the TAMU College of Veterinary Medicine has kept tuition as affordable as possible, over \$7,000 less than the average veterinary school tuition in the 10 most populous states.

Data Sources

Data and information included in this report came from the following sources:

American Veterinary Medical Association
Association of American Veterinary Medical Colleges
Journal of the American Veterinary Medical Association
National Agriculture Statistics Services – Texas Field Office
National Center for Education Statistics
States' Veterinary Boards
Texas A&M University – College of Veterinary Medicine
Texas Department of State Health Services
Texas Higher Education Coordinating Board
Texas State Board of Veterinary Medical Examiners
Texas State Demographer
Texas Veterinary Medical Association
Texas Workforce Commission
U.S. Census of Agriculture
U.S. Census Bureau
U.S. Department of Agriculture

Appendices

- A-1** *A Methodology for Projecting the Need for Professional Education*
- A-2** Projections Methodology
- A-3** Texas Baccalaureate Degrees, Texas A&M University College of Veterinary Medicine Applicants, and First-Year Entering Enrollment
- A-4** Definitions of Veterinary Specialty Terminology
- A-5** Actively Practicing Veterinarians Residing in the American States

Approved by Board April 19, 2002

A-1: A Methodology for Projecting the Need for Professional Education

**Texas Higher Education Coordinating Board
April 2002**

I. Introduction

A. Projected Need/Demand for Services

The physical, economic, and social well being of Texas requires sufficient numbers of physicians, attorneys, dentists, pharmacists, veterinarians, and other professionals to meet the needs of our diverse, rapidly increasing population. In simplest terms, to meet growing needs we can produce those professionals in our own schools, or we can "import" them after they have been educated elsewhere. In practice, we do both. A mobile society and a healthy Texas economy will ensure that we continue to attract professionals educated elsewhere. And we will, of course, continue to produce our own.

Having enough professionals in the state to provide needed services is only one aspect of a complex issue. We must also have an appropriate balance of generalists versus specialists and an appropriate balance of specialists themselves (among physicians, for example, appropriate numbers of cardiologists, orthopedic surgeons, oncologists, etc.). In addition to having the appropriate numbers and types of providers, we also need to have them geographically distributed in such a way as to ensure everyone fair access to needed services. Achieving that broad distribution of professionals is one of our greatest challenges.

B. Projected Need/Demand for Opportunities

Points mentioned above are essentially supply and distribution issues, obviously important and of great concern. But there is another important issue. Providing the people of Texas access to professional education – opportunities to become doctors, lawyers, dentists – is a responsibility the state has long assumed, and that responsibility must be carried out with equity and fairness. A growing population requires periodic re-examination on a statewide and regional basis of how the state will do that.

These two broad issues – supplying professionals and providing opportunities for professional education – greatly influence one another and are connected to the goals of closing gaps in participation, success, and excellence. Each stems from the large population growth projected for Texas. Addressing them will continue to require the attention of the state's people and its institutions, agencies, professional groups, and Legislature. To provide a framework for that continuing attention based on the latest available demographic and other data, the Board and its staff have

developed the following methodology for projecting the need for new professional schools, along with directives to staff for its application.

II. The Board's Role

Although legislators will continue to introduce initiatives calling for the creation of new professional schools, and the Legislature, of course, has the authority to approve or disapprove those initiatives, general statutory directives indicate that the Legislature relies on the Coordinating Board to provide guidance, oversight, and advice for the provision of a statewide system of high-quality higher education. Professional schools are an important part of such a system, and the Board, therefore, has an obligation to periodically provide the Legislature an objective, impartial analysis of the need for new professional schools to inform their deliberations and decisions.

III. Two Key Points – A Framework for an Analysis of Need

The methodology presented here principally projects the need for professional education on the basis of only two factors: the need for services and the need for opportunity. *It does not presume that those are the only factors on which a decision to create a new professional school should be based.* Before such a decision is made, a range of other factors should be considered, including, but not limited to, the costs and benefits of meeting any identified needs (including economic development benefits to the region in which the school would be located); the examination of various approaches to meeting those needs; the effects the creation of a new professional school would have on existing schools; the priority needs of the state at the time a decision is made; and the state's ability to create and maintain a new school while meeting other needs (for higher education and/or other areas of state responsibility). This methodology does not include consideration of those factors, but, to the extent possible, the staff shall provide the Board, and others, information on those points, as well.

The methodology builds a framework for analysis through two questions:

A. Is there an increasing need/demand for services?

Analysis shall focus on statewide and regional trends in population, practitioners, and graduates of professional schools.

a. Population growth

At least once every five years, the staff is directed to report to the Board on the state's population and demographic changes (statewide and regional, current and projected). Comparisons to national averages and those of the 10 most populous states shall be provided. The staff shall use the latest available data and projections.

b. Supply of professional services

At least once every five years, the staff is directed to bring to the Board an analysis of the distribution of doctors, dentists, lawyers, pharmacists, veterinarians, and other important professional service providers. Analysis shall include examining practitioner/population ratios on a statewide and regional basis and comparisons to national averages and those of the 10 most populous states. When available, comparison to recommended norms by professional associations (e.g. American Medical Association) shall also be made. The staff shall use the latest available data and projections and engage practicing professionals in the fields addressed.

B. Is there increasing demand from people who want to be "professionals?"

Analysis shall examine access to educational opportunities, from statewide and regional perspectives.

a. Opportunity – people aspire to the professions

At least once every five years, the staff is directed to bring to the Board an analysis of the patterns of student application, offers of admission, enrollments, retention, and graduation for the state's schools of medicine, dentistry, pharmacy, veterinary medicine, law, and other important professional schools (both public and independent). Analysis of trends in the number of baccalaureate graduates (the pool from which professional school students come) shall also be provided, both statewide and by region. Staff shall use the latest available data and projections and provide comparisons to national averages and those of the 10 most populous states.

b. Geographic access

The analysis mentioned immediately above shall include an examination of the geographic origin of students applying to and enrolling in the state's professional schools.

IV. Developing Board Policy

At least once every five years, the Board shall consider the following *General Policy Questions* as a basis for general policy recommendations about the development of professional schools.

A. As Texas' population increases, should the state try to ensure proportional increases in doctors, lawyers, dentists, pharmacists, veterinarians, and other professionals?

B. If we increase the numbers of professionals, should we do that by:

- a. Producing more ourselves?
- b. Importing them from outside Texas?
- c. Both?

C. If Texas baccalaureate graduates increase, should available spaces in Texas professional schools increase proportionally?

D. If available spaces are increased, should we do that by:

- a. Increasing the size of existing schools?
- b. Creating new schools?
- c. Both?

V. Key Questions and Answers

- A. Staff shall analyze regional and statewide population projections and the consequent projected increases in 1) demand for services, and 2) demand for opportunities for Texas students to attend professional schools. If the analysis indicates that additional capacity is needed, the staff shall recommend answers to the following questions:
 - a. On the basis of projected population growth, what type of additional professional school capacity (medical, law, etc.) is needed, and by when?
 - b. On the basis of projected population growth, when should the state begin planning for the creation of a new school or an increase in size for an existing school?
 - c. On the basis of projected population growth, where should a new school be located, or which existing school should increase its capacity?
- B. Staff recommendations shall be guided by Board views developed through Section IV (above).
- C. Following Board consideration, the Board will provide its recommendations to the Legislature and to boards of regents, along with its acknowledgement that any decision to create a new professional school should be based not only on needs identified through an analysis of projected demand for services and demand for opportunity, but on consideration of the factors mentioned in Section III above (costs and benefits; examination of various approaches; effects on existing

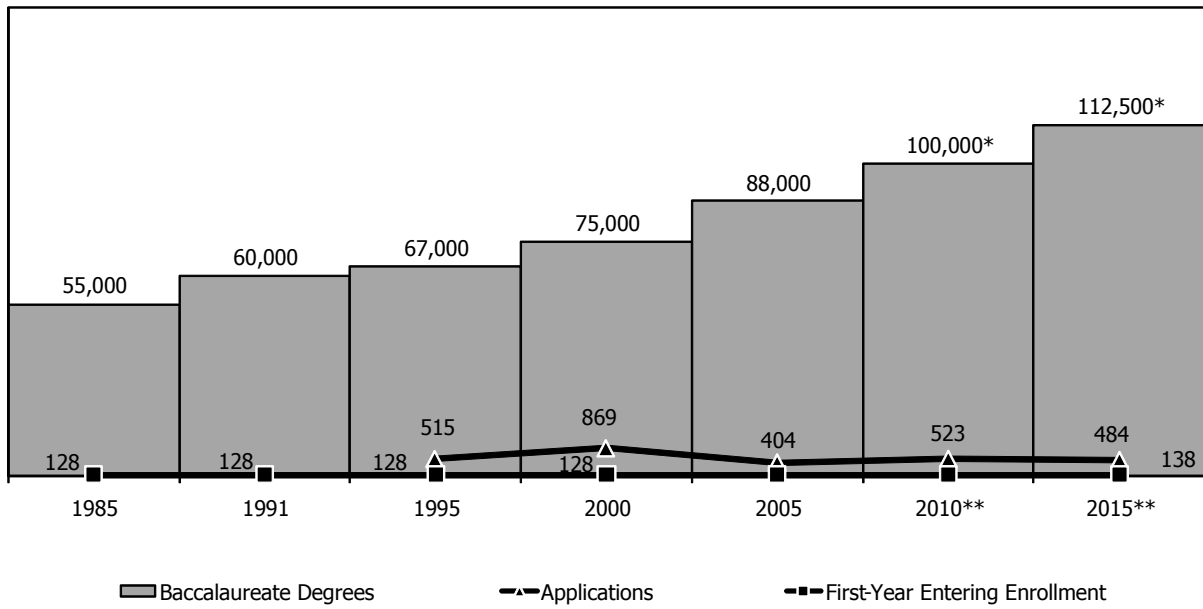
schools; and the state's priorities, needs, and financial capabilities at the time a decision is made).

A-2: Projections Methodology

Projection rates were obtained by calculating the step value, or the difference between the first and next value in a series, and then calculating a trend line. Five-year increments were used to simplify projections and provide consistency with prior *Projecting the Needs* reports.

Microsoft Excel was used to calculate a trend line (slope) using a basic regression equation, $y=mx+b$.

A-3: Texas Baccalaureate Degrees, Texas A&M University College of Veterinary Medicine Applicants, and First-Year Entering Enrollment



Sources: Applications and First-Year Entering Enrollment (1985-2005): TAMU College of Veterinary Medicine. Baccalaureate Degrees, Applications and First-Year Entering Enrollment (2010-2015): Texas Higher Education Coordinating Board.

*Closing the Gap targets for baccalaureate degrees.

** Projected: See Appendix for the methodology used to make projections.

A-4: Definitions of Veterinary Specialty Terminology

Veterinarians often use the terms “large animal,” “small animal,” and “equine” to describe their areas of practice. The term “food animal” is also used, often to include poultry and swine, which are sometimes not assumed to be “large animals.”

After careful consideration of the particular situation in Texas, however, and in consultation with members of the veterinary community, the Coordinating Board has opted to use the term “food and fiber” rather than “large animal” or “food animal.” The reason is that there is a growing market for emus, ostriches, llamas, and alpacas in Texas, which are used primarily for their skins or hair. Goats and sheep are used for food, but also for their skins and hair. Not all food animals are large (i.e., chickens), and not all large animals are used for food (i.e., horses and donkeys). The term “food and fiber,” one that is less common but growing in acceptance in the veterinary community, is used here to describe veterinarians who treat all the animals that are used for commercial, rather than companion, purposes.

Horses are in a unique position in the veterinary discipline because they are both “large animals” and “companion animals.” Because of their large number, unique medical needs, and multiple functions as sport/commercial/companion animals, they usually are given their own status as a veterinary specialty. The Coordinating Board has accordingly preserved the term “equine” in this report.

The term “small animal” includes all animals used primarily as domestic pets. The largest number of these are cats and dogs, but it includes birds, tropical fish, “exotics” (mostly reptiles) and “pocket pets” (mostly rodents).

The term “mixed practice” means a veterinarian who serves both food and fiber animals and small animals. Typically, these veterinarians practice in rural communities where clients will bring in both cattle and the family pet.

The breakdown of which kinds of animals and self-reported practice specialties we are considering to be “food and fiber,” “small animal,” “equine,” “research,” and “mixed practice” are given below.

Small Animal	Food and fiber	Equine	Research	Mixed Practice
Avian	Caprine	Equine	Diagnostic Lab	General
Small animal	Dairy		Government	Mixed practice
	Exotic hoof stock		Laboratory animal	Other
	Feed lot		Military	Unknown
	Herd health consultant		Primate	Zoo animal

	Industrial Large animal Ovine Poultry Ranch practice Ratite Swine		Research Teaching	
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A-5: Actively Practicing Veterinarians Residing in the American States

State	Veterinarians	Veterinarians per 100,000 Population	Rank
Colorado	4,046	85.12	1
Delaware	488	83.92	2
Iowa	2,472	82.90	3
Idaho	983	67.30	4
Oregon	2,190	59.18	5
Montana	557	58.96	6
Nebraska	1,040	58.81	7
Rhode Island	605	56.67	8
Vermont	347	55.62	9
Maine	690	52.21	10
Wyoming	268	52.04	11
New Hampshire	657	49.97	12
Kansas	1,350	48.84	13
Kentucky	2,012	47.84	14
South Dakota	373	47.70	15
Alaska	302	45.07	16
Massachusetts	2,773	43.08	17
Maryland	2,418	43.06	18
Wisconsin	2,308	41.54	19
North Carolina	3,672	41.46	20
Missouri	2,229	38.15	21
Minnesota	1,917	37.10	22
Michigan	3,698	36.63	23
Georgia	3,263	34.85	24
Washington	2,209	34.54	25
Connecticut	1,209	34.50	26
Florida	6,174	34.13	27
Indiana	2,144	33.96	28
New Mexico	652	33.36	29
Pennsylvania	4,130	33.20	30
Oklahoma	1,183	33.05	31
Arizona	2,027	32.87	32
Nevada	814	32.62	33
Virginia	2,433	31.83	34
North Dakota	202	31.77	35
Illinois	4,023	31.35	36
Hawai'i	399	31.04	37
Ohio	3,500	30.49	38
Tennessee	1,813	30.02	39
New Jersey	2,500	28.65	40
New York	5,145	26.65	41
Louisiana	1,131	26.38	42
Alabama	1,175	25.55	43
Mississippi	700	24.05	44
Texas	5,354	23.02	45
Arkansas	629	22.38	46
Utah	567	22.23	47
California	7,730	21.20	48
West Virginia	336	18.48	49
South Carolina	794	18.37	50
D.C.	50	5.86	51
Average	1,955	39.60	--

Sources: U.S. Census Bureau, and States' veterinary boards. Texas Population: Texas State Demographer. Average: Texas Higher Education Coordinating Board.

*Average is for the 10 most populous states.