Veterinary technology graduates' perception of preparedness and utilization in the workforce

Melissa Ann Schalles

University of Nevada, Las Vegas

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VETERINARY TECHNOLOGY GRADUATES' PERCEPTION OF PREPAREDNESS AND UTILIZATION IN THE WORKFORCE

by

Melissa Ann Schalles

Bachelor of Science
Colorado State University
1998

A thesis submitted in partial fulfillment of the requirements for the

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Department of Educational Leadership
College of Education

Graduate College
University of Nevada, Las Vegas
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Veterinary Technology Graduates' Perception of Preparedness
and Utilization in the Workplace

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Master of Science in Educational Leadership

Examination Committee Chair

Dean of the Graduate College

Examination Committee Member

Examination Committee Member

Graduate College Faculty Representative
ABSTRACT

Veterinary Technology Graduates' Perception of Preparedness and Utilization in the Workforce

by

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University of Nevada, Las Vegas

This is a descriptive study to determine the perceptions of the Associate of Applied Science graduates of the Veterinary Technology program at the College of Southern Nevada on their preparedness for and utilization in the veterinary workforce. These graduates complete an accredited program which follows the guidelines on the essential and recommended skills list identified and approved by the American Veterinary Medical Association's Committee on Veterinary Technician Education and Activities (AVMA/CVTEA).

This study allowed the researcher to review the current curriculum at the College of Southern Nevada by reporting data from annual graduate follow-up surveys to confirm the curriculum complements the essential skills list. This study not only evaluated the perception of workforce utilization of program graduates, but the perception of educational preparedness and hands-on skill sets. Results indicate that program graduates feel they are utilized in and prepared for the veterinary workforce; however the numbers are too small to generalize to other AVMA accredited programs.
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This manuscript is dedicated to all of the friends and family who supported me throughout this educational endeavor. I would first like to thank my husband David for standing behind me and giving me his constant encouragement and love. I would like to tell my daughter Gabriella thank you for forcing me to take time out of my day to smell the flowers. Thank you to my parents, Kim and Barbara Chesley for their never ending love and support throughout this venture. I appreciate the life’s lesson I have learned from my Grandma Shirley and my late Grandfather William Thaler, Sr. Without the do it right the first time attitude I would not have pursued this graduate degree. And finally I would like to thank my thesis committee, Chairperson- Dr. Cecilia Maldonado-Daniels, Committee Members- Dr. Sterling Saddler, Dr. Clifford McClain, and Graduate School Representative- Dr. Paul Jones for all of their assistance and guidance with this manuscript.
CHAPTER ONE

INTRODUCTION

Historical Perspective of Veterinary Technology

The first mention of Veterinary Medicine was around 9000BC in Shepherding Cultures of the Middle East, according to Dunlop and Williams (1995). Almost 7000 years later Egyptian medical textbooks began to mention veterinary medicine again. The early Egyptian authors had a rudimentary understanding of basic animal anatomy, disease processes, and certain treatment methods of cattle, dogs, birds, and fish. Having an understanding of these species assisted these early cultures with the knowledge of most of their food sources, and transportation sources (Dunlop and Williams, 1995).

The first veterinary school was built in Lyon, France in 1761, later referred to as the Lyon Veterinary School, and known today as the National Veterinary School of Lyon (Ecole Nationale Vétérinaire de Lyon, 2007). The school’s developmental purpose was to provide a setting away from the general population for students to study anatomy and diseases of mainly horses, cattle, and sheep (Carbajal, 2005). Most veterinary education institutions start out with this same purpose of beginning. The mission of the College of Southern Nevada "... ensures that they [the college] will serve the diverse needs of the residents of Southern Nevada by responding to the educational needs of the communities and businesses within the CSN service area" (College of Southern Nevada [CSN] Mission Statement, 2007b).
"The first formal college-level training program for animal health technicians in this country was established in 1961, at the State University Agricultural and Technical College at Delhi, New York (SUNY at Delhi)" (Collins, 1980, p. 1). The program graduated a total of 8 students after just two years of instruction with an Associate Degree in Applied Science. Since then programs have been springing up all over the United States. As of November 2007 the American Veterinary Medical Association (AVMA) has a total of 140 accredited veterinary technology programs, in all but six (6) of the states including the District of Columbia (American Veterinary Medical Association [AVMA], 2007a).

The first reference to trained veterinary nursing assistance was around the middle of the 1960's. Prior to that time, animal health care training came from on the job training, handed down skill sets from ranchers, veterinarian's wives or no training at all (Collins, 1980). As technological advancements in veterinary medicine became more well known to not only animal health care team members, but to the general public, so did the increase in demand for more improved health care for animals and an increase in variety of services offered. This demand amplified the veterinarian’s need for educated and trained assistance in the veterinary facility.

History of the College of Southern Nevada’s Veterinary Technology Program

The earliest documentation on record for the Veterinary Technology program at the College of Southern Nevada (CSN) is 1995. The program was developed to meet the needs of the Las Vegas valley veterinarians. In 1995, the population of the City of Las Vegas was 371,809 (City of Las Vegas, 2007); Clark County was 1,040,688; and the
number of occupied households was 398,951 (Clark County, 2007). Utilizing the American Veterinary Medical Association web site formulas, the researcher calculated the statistics for households and number of pets (see Table 1 and Table 2).

Veterinary technology is a limited entry program, which is defined in the 2007-2008 general catalog and student handbook as "...class sizes are limited" (CSN, 2007, p. 11), in the Department of Health Related Professions, as part of the School of Health Sciences. In March of 2006, the Associate of Applied Science (AAS) degree program received full accreditation from the American Veterinary Medical Association (AVMA), and was the first veterinary technology program in the state of Nevada to receive this accreditation.

Students enrolled in the program are required to complete two years (four semesters) of veterinary technician course work. This is including but not limited to; surgical assisting, nursing care, animal husbandry, large animal nursing care, and two semesters of anatomy and physiology. Students are educated to at least an entry-level skill set according the requirements of the American Veterinary Medical Association’s (AVMA), Committee on Veterinary Technician Education and Activities (CVTEA) standards for accreditation. The above listed course work (47 credits) does not include the 27 additional general credits outside of the veterinary technician program required by the college for graduation requirements. Upon completion of this thesis the Veterinary Technology Program at the College of Southern Nevada (CSN) will have graduated two classes since the initial accreditation by the AVMA/CVTEA.

The researcher has been employed as a full time instructor at the College of Southern Nevada in the Veterinary Technology program since January of 2005. The information
and data gathered is based on personal documentation and knowledge since the researcher’s hire date. The record keeping prior to January of 2005 was not adequate and has been improved upon.

**Table 1.** 1995 Number of Clark County Households with Pets

<table>
<thead>
<tr>
<th>Animal</th>
<th>Multiplier</th>
<th>Household No.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs</td>
<td>0.361</td>
<td>398,951</td>
<td>144,021</td>
</tr>
<tr>
<td>Cats</td>
<td>0.316</td>
<td>398,951</td>
<td>126,069</td>
</tr>
<tr>
<td>Birds</td>
<td>0.46</td>
<td>398,951</td>
<td>18,352</td>
</tr>
<tr>
<td>Horses</td>
<td>0.017</td>
<td>398,951</td>
<td>6,782</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>295,224</strong></td>
</tr>
</tbody>
</table>

Note: The table reflects the procedure identified by AVMA for calculating households with pets. Household numbers retrieved from Clark County Census Information (1995).

**Table 2.** - 1995 Number of Clark County Pet Population

<table>
<thead>
<tr>
<th>Animal</th>
<th>Multiplier</th>
<th>Household #</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs</td>
<td>0.58</td>
<td>398,951</td>
<td>231,392</td>
</tr>
<tr>
<td>Cats</td>
<td>0.66</td>
<td>398,951</td>
<td>263,308</td>
</tr>
<tr>
<td>Birds</td>
<td>0.10</td>
<td>398,951</td>
<td>39,895</td>
</tr>
<tr>
<td>Horses</td>
<td>0.05</td>
<td>398,951</td>
<td>19,948</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>554,543</strong></td>
</tr>
</tbody>
</table>

Note: The table reflects the procedure identified by AVMA for calculating households with pets. Household numbers retrieved from Clark County Census Information (1995).

The following table data is tabulated from the Professional Examination Service (PES) biannual result reports and reflects the Veterinary Technician National
Examination (VTNE) results for the College of Southern Nevada Associate of Applied Science graduates. This service administers the Veterinary Technician National Examination twice a year in the state of Nevada (January and June). Since the full accreditation from the American Veterinary Medical Association, the College of Southern Nevada’s veterinary technology program receives biannual result reporting from PES. Please see Table 3 below.


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Taking Exam</td>
<td>7</td>
<td>2</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Passing Exam</td>
<td>7</td>
<td>2</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Total Test Takers</td>
<td>18</td>
<td>13</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Pass Rate (%)</td>
<td>100</td>
<td>100</td>
<td>77</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: These numbers do not delineate those re-taking the exam multiple times. Data retrieved from PES biannual reports sent to the College of Southern Nevada.

According to a personal phone communication with Tracy Estep at the State of Nevada Board of Veterinary Medical Examiners (May 25, 2007) the following are requirements for persons interested in taking the Nevada State Veterinary Medical Examination.

- All candidates applying for licensure in the state of Nevada must complete and pass a take-home jurisprudence examination
- Candidates must pass with a 90% (Tracy Estep, personal communication, May 25, 2007). Additionally, she added that since 2006 all Associate of Applied
Science Candidates of the College of Southern Nevada, taking the examination have passed (Tracy Estep, personal communication, May 25, 2007).

The researcher can conclude from the above data, that those Veterinary Technology AAS graduates from the College of Southern Nevada since 2006 who have applied for licensure in the state of Nevada have been successful in passing the take-home jurisprudence state examination with a 90%.

Statement of Problem

According to Dr. Gary Leff, Assistant Director of AVMA Education and Research Division, there are 5-8 veterinary technician positions for each veterinary technician graduate in the United States (Leff, 2006). While the demand for veterinary technicians is increasing, the shortage of graduates continues.

Dr. Leff states that one of the major reasons for this shortage is the pure underutilization of veterinary technicians. The shortage of technicians in the United States is not necessarily due to the number of program graduates, but to technicians not being able to use their skills how they want to use them (Leff, 2006).

The American Veterinary Medical Association Web site states that the average working life of a credentialed veterinary technician is anywhere from 7-10 years; thus increasing the need for more educated and credentialed veterinary technicians (AVMA, 2007a). The Bureau of Labor Statistics’ Web site mentions that the career of veterinary technology is expected to “grow much faster than average” through the year 2014. This is good news for those wanting to enter the field of veterinary technology, since in the year
2004, veterinary technicians held approximately 60,000 jobs in the United States (Bureau of Labor Statistics [BLS], 2007a).

The increase in need of veterinary technicians comes from many factors. Not only is it more appealing for licensed veterinarians to have educated and trained personnel on staff, clients are beginning to demand it. Veterinarians are replacing team members, such as veterinary assistants, with credentialed veterinary technicians to meet the needs of the clients, as well as to meet the increase in technological advancements in veterinary medicine (BLS, 2007a).

The Annual Board Updates sent out every November by the State of Nevada Board of Veterinary Medical Examiners yielded a compilation of statistics and information regarding demographic figures in the career field of veterinary medicine. Table 4 shows the necessity for educated veterinary technicians in the state of Nevada. From the numbers one can see that as of November 2007 there are a total of 734 licensed veterinarians in the state and only 504 credentialed veterinary technicians and veterinary technicians in training, this is significantly increased from November 2004. (State of Nevada Board of Veterinary Medical Examiners, 2004-2007)

The College of Southern Nevada is continuing to produce quality, educated, and trained veterinary technicians. The program at CSN is constantly improving the AAS curriculum to meet the demands of the veterinary professionals, as well as focusing on increasing the number of veterinary technology program graduates to fill the available positions in the field. This fits the mission of the College of Southern Nevada by “…meeting the educational needs of the communities and businesses…” as well as
providing graduates that are satisfactorily trained and knowledgeable with entry level
skill sets in the discipline of veterinary technology (CSN, 2007b).


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New Veterinarians in Nevada</td>
<td>85</td>
<td>71</td>
<td>87</td>
<td>94</td>
</tr>
<tr>
<td>Active Veterinarians</td>
<td>647</td>
<td>585</td>
<td>669</td>
<td>734</td>
</tr>
<tr>
<td>New Credentialed Veterinary Techs</td>
<td>66</td>
<td>63</td>
<td>76</td>
<td>73</td>
</tr>
<tr>
<td>Total Credentialed Veterinary Techs</td>
<td>284</td>
<td>261</td>
<td>327</td>
<td>368</td>
</tr>
<tr>
<td>Veterinary Techs in Training</td>
<td>81</td>
<td>64</td>
<td>108</td>
<td>136</td>
</tr>
</tbody>
</table>

Note: This veterinary demographic data retrieved from State of Nevada Board of Veterinary Medical Examiners Annual Board Updates dated from November 2004 – November 2007.

Conceptual Framework

In this study and in veterinary technology education there is one indicator utilized to characterize an "entry level" veterinary technology program graduate; the American Veterinary Medical Association's Committee on Veterinary Technician Education and Activities (AVMA/CVTEA) essential and standard skills list. This standards based education is evaluated by a variety of methods; the Veterinary Technician National Examination (VTNE), as well as state and local practical evaluations or examinations. These standards assist in making sure there is a model curriculum to which all accredited
veterinary technology programs are held to. This not only allows for some uniqueness, but is a very critical component to technical education (Spoerk, 2005). There are also numerous measures that the veterinary employer will launch on each veterinary technology program graduate to make sure of the appropriate "fit" into their specific veterinary facility, including but not limited to; training processes, hands on skill set testing, and written examinations.

Standards based education has become more critical in the area of technical education (Spoerk, 2005). Standards in technical education should be documented statements about "...what is valued in a field of study that can be used for making a judge of quality" (Smith, 1998). In an article titled Consensus toward standards for technical education, the author is quoted at saying, “The sooner we can agree on a set of technology education standards, the closer we will be to a citizenry able to cope with and thrive in a technological future” (Consensus Toward Standards for Technical Education, 1997). This researcher believes this is what the AVMA/CVTEA is accomplishing with the essential and standards skills list.

Spoerk (2005) mentions technical standards based education gives not only the educator but the students an understandable explanation of those technical skill sets which were unclear before. This statement will be considered when evaluating the veterinary technology program graduates perceptions of veterinary workforce preparedness in the secondary survey data being utilized.

The researcher in this study utilized the AVMA/CVTEA's essential and standards skills list, the VTNE, as well as the Nevada State Veterinary Medical Examination as the evaluation tools for this study. Secondary data was retrieved and summarized from
cataloged survey results from previous College of Southern Nevada veterinary technology program Associate of Applied Science graduates since 2005.

Purpose of Study

The purpose of this descriptive study was to determine the perceptions of the Associate of Applied Science graduates of the Veterinary Technology program at the College of Southern Nevada on their preparedness for and utilization in the veterinary workforce. These graduates completed an accredited program which follows the guidelines on the essential and recommended skills list identified and approved by the American Veterinary Medical Association's Committee on Veterinary Technician Education and Activities.

Significance of Study

The priority of veterinary technician educators is to provide students with the appropriate knowledge and entry level skills needed to fully contribute to the career of a credentialed veterinary technician. Students must be able to master the knowledge and skill sets of veterinary medicine, as well as be able to apply the knowledge and skill sets to all applicable situations.

Accredited veterinary technician programs across the nation are educating their students to a standard established by the American Veterinary Medical Association Committee on Veterinary Technician Education and Activities. Graduates leave these programs having the necessary skills to assist veterinarians at an entry or higher level, and expecting a competitive hourly wage and opportunity to make the most of their
recent education; however, veterinary technicians in the career field are both underpaid and underutilized (Leff, 2006).

This being said, this study supports the continued need to produce quality veterinary technicians for the career field; as well as maintain curriculum improvements in the veterinary technology program at the College of Southern Nevada which produces qualified and educated credentialed veterinary technicians to the veterinary workforce.

Research Questions

This study was guided by the following questions:

1. What are the perceptions of the College of Southern Nevada Associate of Applied Science veterinary technology program graduates regarding their preparation for the veterinary workforce (Graduating classes since 2005)?

2. How are the College of Southern Nevada (CSN) Associate of Applied Science (AAS) veterinary technology program graduates being utilized in the workforce (Graduating classes since 2007)?

Limitations

This study has a number of limitations which stem from the data, sample size and instrument. This study will use program data collected by the College of Southern Nevada for program improvement in the Associate of Applied Science Veterinary Technology program and will only report the findings collected from graduates since 2005.
Limitations of this study primarily stem from the quality of the instrument which was utilized to measure perceptions of the graduating class of 2005 and 2006, and ultimately modified for the class of 2007 as well as the return rate of surveys, specifically from the class of 2007. The survey used to gather data from the 2005 and 2006 graduates primarily was concerned with understanding of the perceptions of preparation for the veterinary workforce. That survey did not use a Likert scale for evaluation and was the impetus for modifying it. Return rates for the 2005 and 2006 class were 39% and 52% respectively, and the return rate for the 2007 class was 39%; creating a small sample size for data.

Definition of Terms

AAS- Associate of Applied Science in Veterinary Technology- 74 completed credits from the College of Southern Nevada (47 program credits) (CSN, 2006).

Accreditation- Accreditation is a process by which an educational institution or program submits to a voluntary, non-governmental review to determine whether it meets accepted standards of quality (AVMA, 2007b).

Animal / Patient- excludes a human being and includes any mammal, amphibian, fowl, fish or reptile, wild or domestic, living or dead (Nevada Law Library, 2007 638 NRS § 002).

Bio-terrorism- A bioterrorism attack is the deliberate release of viruses, bacteria, or other germs (agents) used to cause illness or death in people, animals, or plants (Centers for Disease Control [CDC], 2008).

CDC- Center for Disease Control- Mission statement: to promote health and quality of life by preventing and controlling disease, injury, and disability (CDC Mission Statement, 2008).

Client- a human being who assumes financial responsibility for the animal (Bassert, 2006)

Credentialed Veterinary Technician- a person licensed by the Board—a person formally trained for the specific purpose of assisting a licensed veterinarian in the performance of professional or technical services in the field of veterinary medicine. Also known as: Licensed Veterinary Technician (LVT), Certified Veterinary Technician (CVT), or Registered Veterinary Technician (RVT) (Nevada Law Library, 2007, 638 NRS § 013).

CSN- College of Southern Nevada- Founded in 1971, CSN is Nevada's largest institution of higher education and the 4th largest community college of its kind in the nation. CSN operates in over 50 locations including 3 main campuses and 11 learning centers in 4 counties covering 42,000 square miles. With student success as our number one priority, CSN educates over 70,000 students annually in over 100 fields of study offering more than 200 degrees and certificates (CSN, 2007a).

CVTEA- Committee on Veterinary Technician Education and Activities- accredits veterinary technology programs. All AVMA CVTEA-accredited programs in veterinary technology must meet the Standards of Accreditation of the CVTEA to ensure the quality
of the educational experience and the assessment of student knowledge and skills (AVMA, 2007a).

DVM- Doctor of Veterinary Medicine- also known as Licensed Veterinarian-Veterinarians diagnose and control animal diseases, treat sick and injured animals, prevent the transmission of animal diseases ("zoonoses") to people, and advise owners on proper care of pets and livestock. They ensure a safe food supply by maintaining the health of food animals. Veterinarians are also involved in wildlife preservation and conservation and public health of the human population (AVMA, 2007a).

Essential and Recommended Skills List- The Essential and Recommended Skills List is a resource for veterinary technology programs to utilize for curriculum development and instruction as well as an accreditation monitoring tool for CVTEA. The Skills List represents the complex role of the veterinary technician and encourages instruction in motor, critical thinking and clinical application skills at the entry veterinary technician level (AVMA, 2007a). See Appendix A.

MRC- Medical Reserve Corps- The MRC is a national network of volunteer units that, under the sponsorship of the U.S. Surgeon General and local groups, supplement community resources for emergency response and public health. Veterinary Component-
In several states, MRC units have formed specifically as a veterinary corps or animal response team. Now, the multidisciplinary MRC units are trying to incorporate more veterinarians (AVMA News, 2007).

NAVTA- National Association of Veterinary Technicians in America- This association promotes and defends the Veterinary Technician profession using several
different methods (National Association of Veterinary Technician’s in America [NAVTA], 2007).

PES- Professional Examination Services- The mission of Professional Examination Service (PES), a nonprofit corporation, is to promote and protect the public welfare by articulating and demonstrating the value of credentialing and continuing competency assurance. PES meets its mission by providing services and funding selected public service initiatives that impact the quality of the credentialing and continuing-competency assurance process (Professional Examination Service [PES], 2007).

VTNE- Veterinary Technician National Examination- The VTNE is a 200-item multiple choice examination prepared under a contractual agreement between the American Association of Veterinary State Boards (AAVSB) and the Professional Examination Service (PES) (American Association of Veterinary State Boards [AAVSB], 2007).

Veterinary Facility-any facility in which veterinary medicine is practiced (Nevada Law Library, 2007 638 NAC § 018).

Veterinary Technician in Training-a person may perform the tasks of a veterinary technician under the immediate supervision of a supervising veterinarian or a licensed veterinary technician while the person is receiving the training and experience required by paragraph (g) of subsection 2 if he is registered with the Board pursuant to this section (Nevada Law Library, 2007 638 NRS § 0525).

Workforce- Biomedical Research, Colleges/Universities, zoos, military service, drug and food manufacturing, food safety inspection, diagnostic laboratories, sales, human societies and private practice (Bassert, 2006).
Zoonosis - Is a disease of animals that is transmissible to humans under natural conditions (Eddlestone, 2006).

Summary of Introduction

In this chapter the researcher introduced the reader to a variety of ideas and terms in veterinary technology. There was a brief discussion of the history of veterinary medicine and the beginnings of veterinary technology. The researcher then chronicled the start of the Associate of Applied Science Veterinary Technology program at the College of Southern Nevada and its accreditation. Data results of the Veterinary Technician National Examination as well as the Nevada State Board of Veterinary Medical Examiners are also presented in this introductory chapter. Finally the researcher declares the purpose and significance of the study as well as a statement of the problem. In chapter 2, the review of literature, the researcher will discuss the need of veterinary technicians in America, retention and turnover issues, and a movement towards standard based education in technology.
CHAPTER TWO

REVIEW OF LITERATURE

Introduction

The purpose of this descriptive study was to determine the perceptions of the Associate of Applied Science graduates of the Veterinary Technology program at the College of Southern Nevada on their preparedness for and utilization in the veterinary workforce. These graduates completed an accredited program which follows the guidelines on the essential and recommended skills list identified and approved by the American Veterinary Medical Association's Committee on Veterinary Technician Education and Activities. Veterinary technicians are an essential member of the veterinary team, and are charged with many basic and advanced responsibilities in the veterinary facility. The goal of veterinary technology is to promote animal health while also contributing to human health (BLS, 2007a). The career field is comprised of 90% women with an age range of 18-50 years old (AVMA, 2007a).

While working in the discipline of veterinary medicine, there are a multitude of specific working conditions the Bureau of Labor Statistics (2007b) mentions that credentialed veterinary technicians should be aware of. Sometimes the environment can be unpleasant (smells), physically demanding (lifting animals), and even dangerous (animal bites). The position requires approximately 40-50+ hours a week of commitment, for an average of $12.88 an hour. The range of pay is $8.79 – 18.68 per hour worked and
that is dependent on position held and demographic information (BLS, 2007b). Bassert mentions that the average starting salaries for recent (1999) veterinary technician graduates ranges from $17,238 to $23,625 with an overall average salary of $20,161 (Bassert, 2006).

Credentialed veterinary technicians perform tasks under the supervision of a licensed veterinarian, whom expects the technician to be educated in the care and handling of specific species of animals. With this trust from the licensed veterinarian there also lies an empowerment; “...the authority to actually delegate specific and appropriate responsibilities to other members of the veterinary health care team, such as veterinary assistants and kennel staff” (Bassert, 2006, p. 12). There are tasks that the American Veterinary Medical Association does not allow credentialed veterinary technicians to execute and they are; diagnose medical diseases, prescribe medications (unless directed by a licensed veterinarian), and perform surgical procedures (AVMA, 2007b). However there are numerous responsibilities that credentialed veterinary technicians can perform. Administering medications, assisting with dental prophylaxis, assisting in surgeries, and assisting the licensed veterinarian are just a few of the tasks that are listed on the Bureau of Labor Statistics web site (BLS, 2007a).

The above mentioned tasks are not all of the responsibilities of the credentialed veterinary technician, in fact the Veterinary Technician National Examination (VTNE) tests the candidate on seven (7) particular areas; pharmacy and pharmacology, surgical preparation and assisting, laboratory procedures, animal nursing, anesthesia, office and hospital procedures, and lastly radiology and ultrasound (Bassert, 2006). This is what
allows veterinary technology educators to standardize the educations the graduates are receiving in the individual accredited veterinary technology programs.

To become a credentialed veterinary technician, candidates must have graduated from a two- or three-year AVMA-accredited veterinary technology program; they must pass the Veterinary Technician National Examination (VTNE), as well as any state credentialing exams or practical examinations, and then fulfill any other state requirements for credentialing (Bassert, 2006). Any candidate seeking credentialing in a specific state must check with the individual state. Approximately one-third of the United States require at least an Associate of Applied Science degree from an accredited school, with the paramount prospects for career opportunities in this field going to graduates of these accredited veterinary technology programs (Kasper & Crosby, 2003).

Those interested in the career field of veterinary technology will have the prospect of working with an assortment of animal species, such as but not limited to; dogs, cats, mice, rats, sheep, pigs, cattle, horses, monkeys, birds, fish, and frogs (Kehn, 2004). While working with animals is an important element of the position of a credentialed veterinary technician, they also must have excellent communication skills, work well with others, and be extremely detail orientated (BLS, 2007a).

There are a multitude of career options that are available in the field of veterinary technology. In the veterinary private practice setting, credentialed veterinary technicians have similar responsibilities to those of a human registered nurse in a medical doctor’s office. Occasionally the responsibilities of a credentialed veterinary technician might extend beyond those of the human nurse, even combining duties of many human health care workers (Kasper & Crosby, 2003).
Kasper and Crosby (2003) actually refers to credentialed veterinary technicians as animal nurses, and the researcher also found that term used in numerous other references; however, that term is reserved for usage in European countries according to Bassert (2006). The term veterinary nurse is a more comprehensive term that in actuality tells the general pet owner exactly what responsibilities that specific veterinary team member can perform. The term credentialed veterinary technician is very universal and can have a variety of meanings, which can cause confusion to those outside the veterinary field as well as veterinary professionals.

Biomedical research is the new and upcoming opportunity for the fast growing field of veterinary technology. Credentialed veterinary technicians are in charge of major research projects, and assisting in the care and handling of research animals (AVMA, 2007b). With the threat of bio-terrorism on the rise, credentialed veterinary technicians are going to be needed to handle a variety of tasks in the field of biomedical research. The position will be not be limited to just research, but direct work with specific government agencies; thus having impressive communication skills (written, verbal, and electronic) will be of a colossal advantage to any credentialed veterinary technician seeking an opportunity in this field.

Kasper and Crosby state that veterinary technicians should be skilled in their backgrounds, and provide medical assistance to the licensed veterinarian (2003). Licensed veterinarians depend upon competent credentialed veterinary technicians to perform duties in the veterinary facility to assist the veterinarian to make the correct diagnosis for certain disease processes (Kasper & Crosby, 2003). Without these proficient credentialed veterinary technicians in the veterinary facility, licensed
veterinarians would be performing these tasks on their own; thus taking up valuable time in the veterinary hospital, and taking time away from the patient.

According to the American Veterinary Medical Association there are a plethora of additional career prospects in the discipline of veterinary technology; credentialed technicians have employment opportunities in college and university settings, zoos and wildlife parks, military services, food safety inspection, diagnostic laboratories, drug and food manufacturing, sales, and humane societies to name a few (AVMA, 2007b).

Some credentialed veterinary technicians might also find themselves in other occupations in the animal field; such as but not limited to, animal trainers, groomers, pet sitters, hospital managers, and ranch managers (Kasper & Crosby, 2003).

Need for Veterinary Technicians

Across the United States there is a vast scarcity of credentialed veterinary technicians to fill the opportunities that are available (Bassert, 2006). In Kasper and Crosby’s article dated fall of 2003, in the Occupational Outlook Quarterly, credentialed veterinary technicians held approximately 50,000 positions in the United States (2003) and are expected to reach 71,000 positions in just six years. Ultimately, it is predicted that there will be almost 100,000 positions in the year 2016 (BLS, 2007b). That is almost a 100% increase in growth from the year 2000 to 2016.

AVMA accredited veterinary technology program graduates are finding that positions are abundant when they graduate, however; the salary compensations are dependent on the field of interest, experience, as well as demographic information. (Bassert, 2006) On average the veterinary technology graduate will have 5-8 positions available for them to
select from. (Leff, 2006) That means there are approximately 7 positions going unfilled, leaving licensed veterinarians with a massive shortage of properly trained, and educated credentialed veterinary technicians. This shortage creates a considerable concern for not only the veterinary team, but the animal’s owner, and the animal’s health and welfare.

In a recent Business Week article, the author was quoted as saying that “…pet owners are becoming increasingly demanding consumers who won’t put up with substandard products, un-stimulating environments, or shoddy service for their animals” (Brady & Palmeri, 2007, p. 1). Thus creating an increase in the demand for quality trained and educated veterinary health care team members. Brady and Palmeri also mention that 63% of Americans (almost 71 million homes) own at least one pet (2007). If this holds true, then the increase in the demand for advanced technology in the veterinary facility from the pet owner, and the need for knowledgeable and trained veterinary personnel will also escalate. Pet owners and their expectations of what is offered in the veterinary facility by veterinary health care professionals have been transformed; consumers are now demanding the same care for their pets as they do for themselves (Brady & Palmeri, 2007). The credentialed veterinary technician and other knowledgeable veterinary personnel are going to have to be there to meet these demands.

When speaking with recent veterinary technology program graduates, Dr. Gary Leff found that the major reason veterinary technicians are leaving the career field is because of underutilization (Leff, 2006). Not only does Dr. Leff mention this statistic, but Bassert reported the same information. “Graduate technicians report leaving the professions because of lack of appreciation and underutilization by their employer…” (Bassert, 2006, p. 4). Almost 65% of credentialed veterinary technicians report leaving their positions at
veterinary facilities after only four (4) years of employment because of the underutilization, but also because of low pay, and the lack of advancement opportunities. (Bassert, 2006) This attrition is an enormous contributing factor to the shortage of credentialed veterinary technicians in the United States.

In 2006, the American public was surveyed by a Zogby poll to gain some insight on disaster planning and need for proper veterinary care pre and post disasters. This poll reported that 61% of American pet owners would refuse to evacuate their homes with a known disaster approaching if they could not bring their pets (Zogby International, 2007). This is believed to be due to what they are now classifying as the human-animal bond (Brady & Palmeri, 2007). According the American Veterinary Medical Association 2001 statistics there are almost 150 million pets (dogs, cats, birds and horses) in the United States (AVMA, 2006), which means that approximately 90 million pet owners would decline to evacuate their homes if a disaster were to occur. To alleviate these pets/animals being left behind in a disaster; President George W. Bush signed a PETS Act, which makes sure that companion animals will be considered in state and local disaster planning (Pets now included, 2006). This creates a huge demand on the veterinary health care team and an increase in the need of trained and educated veterinary personnel.

The state of Nevada has actually incorporated animal concerns into the disaster planning process. As of November 29, 2006 the state of Nevada has a veterinary component integrated into the Medical Reserve Corps (MRC); which is a “…national network of volunteer units that, under the sponsorship of the U.S. Surgeon General and local groups, supplement community resources for emergency response and public health… 500 of the units don’t have any veterinarians on the roster” (AVMA News,
The veterinary component of the MRC is a strictly volunteer force of licensed veterinarians and credentialed veterinary technicians that are deployed by the Southern Nevada Health District in the case of a disaster in the state of Nevada. They are tasked with the responsibility of handling pets and any medical emergencies that arise with these animals during a disaster. After hurricanes Katrina and Rita in 2005 the American public and government learned that animals needed to be looked after during disasters as well as human beings. Not many of us can forget the images of the dogs, cats, horses, etc. seen in the media of the animals left behind, as well as placed in make shift shelters during these disasters. The veterinary component of the MRC was designed to prepare for such catastrophes and others and increase the health and welfare of these animals.

In 2006, Lindvay reported the necessity for large animal credentialed veterinary technicians in the field. With government concerns rising about terrorist threats to the United States’ food animal supply, there has been a need for the increase of food animal veterinarians; thus creating an increase in the need for food animal credentialed veterinary technicians. Food animals that are entering the human consumption venue need to be designated safe for the human food supply and credentialed veterinary technicians are tasked with some of these responsibilities. By hiring an educated and well trained food animal credentialed veterinary technician, licensed veterinarians can decrease their workloads by as much as 50% (Lindvay, 2006).

In 2006 the Humane Society of the United States (HSUS) completed a survey about pet ownership in the United States. The results of this survey show that as of 2006 there are 73 million dogs, and 90 million cats which are owned in the United States with dog owners. On average, these dog and cat owners spend on average of almost $211 and $179
respectively for each routine veterinary visit (HSUS, 2007). Pet owners are now humanizing their pet’s diseases (Brady & Palmeri, 2007) which means that owners are now assigning human traits to their animals and their ailments. The monies which are being spent on this veterinary care only demonstrate the increase in the demand on the veterinary health care team and veterinary facility.

Brady and Palermi, in Business Week, point out that in 2006 Americans spent 41 billion dollars a year on their pets, and with in the next two years that number is expected to increase to almost 52 billion dollars (Brady, 2007). That same article also points out that some pet owners are actually quoted as saying there is “no medical procedure too extreme” (p. 2) for their pets. These consumers are purchasing braces for their dogs and cats, placing them in doggy and kitty hotels instead of kennels, and actually paying thirty (30) dollars an ounce for doggy perfume (Brady & Palmeri, 2007). This demand for these specialty services from these consumers are driving the need to create an environment where veterinary facilities are not going to be able to keep up with these specific demands. In 2006, Americans spent 9.8 billion dollars on veterinary services alone and almost 10 billion dollars on over the counter supplies and other items (Brady & Palmeri, 2007). The services that these consumers are demanding are essentially being encouraged by veterinarians, who find the specialty procedures more profitable and beneficial than routine services, such as vaccines or euthanasia’s (Brady & Palmeri, 2007).

Veterinary professionals and their services are now at such a high demand that they are having difficulty staffing the needed positions with quality personnel. The increase demand from pet owners for technologically advanced veterinary care and educated veterinary employees increases the need and demand for credentialed veterinary
technicians. American Veterinary Medical Association accredited veterinary technician programs are then faced with having to prepare credentialed technicians for these open positions.

Veterinary Technician Retention / Turnover

In 2007, Firstline Magazine published an article about the importance of veterinary medical personnel having a balanced personal and work life. One of the major points in this article was the veterinary professionals’ ability to balance both work and life (Can you work and have a life, 2007). Without this work/life balance the veterinary professional becomes worn out, this exhaustion leads to turnover and retention concerns in the veterinary facility. The increase in turnover and retention adds to the veterinary facility owner and the cost of an employee. With this increase in cost per employee there is also an associated decrease in employee salary offerings. Huerkamp’s article in 2006, states that “the turnover of veterinary technicians within an animal resources program averaged 33% annually over 18 years, peaking at 67% in 1998 to 1999” (Huerkamp, 2006, p. 16).

Some turnover is actually a necessity in most businesses. The American Management Association (AMA) states on their Web site that “zero percent turnover is not desirable …” (American Management Association [AMA], 2007, ¶ 3) because if employees never left, then most or all of the employees in the veterinary facility would be at the top or near the top of their pay schedule. This is not advantageous for any employer because it creates a stationary workforce and employees would have nothing to strive for thus creating a stagnant work environment (AMA, 2007).
Since there is such a prominent shortage of credentialed veterinary technicians in the veterinary field the turnover statistics listed above heavily affect licensed veterinarians and facility owners. Dr. Leff of the AVMA states that the average working life of a credentialed veterinary technician is anywhere from seven to ten years (Leff, 2006) with most technicians terminating their positions at specific veterinary facilities after just four years. (AVMA, 2007b) This means that on average a credentialed veterinary technician will change jobs almost three times throughout their career.

Retention and turnover are a tremendous loss to any veterinary facility. Training, loss of employee morale, and other related issues cannot be quantified in the cost of turnover and retention. However costs have been estimated to range from 25 percent to almost 200 percent of an employees annual earnings (AMA, 2007). All of that being stated, if a credentialed veterinary technician changes jobs three times in their veterinary technician career (average veterinary technician earns $12.88 an hour [BLS, 2007b]), and turnover costs at a minimum 25 percent of the employees annual salary; that credentialed veterinary technician just costs each of those employers $6500 in turnover expenditures or a total of $19,500.

In a study by Huerkamp, eighteen credentialed veterinary technicians in an academic research institution yielded some interesting results. Of the 18 veterinary professionals; seven left due to health or family reasons, four were transferred laterally with in the institution, four left and pursued other careers, two were terminated for unsatisfactory performance, and one was promoted with in the institution (Huerkamp, 2006, pp. 18-19).

Exit interviews were performed for these veterinary professionals leaving their positions and they were asked to rank (1-12) the most important workplace factors related
the position and their role as an employee. The number one issue these employees listed as most significant was the opportunity to do meaningful work (Huerkamp, 2006). The number two factor was related to pay, and the number three factor was working with a team that was committed to the positions (Huerkamp, 2006).

With turnover rates being so high in the field of veterinary medicine, facility owners need to be performing exit interviews with these employees to find out why these employees are leaving, as well as what they can do to change the working conditions in their veterinary facility. On average, the cost for a credentialed veterinary technician terminating their position at a veterinary facility is $6500; this cost is being absorbed by the veterinarian and passed down to the veterinary health care team.

Veterinary Technician Education

Currently there are over 120 AVMA-accredited veterinary technology programs in the United States ranging from two-year, four-year, and on-line degree programs (Francis, 2006). Veterinary technician education has been evolving and improving to keep up with technological advances in veterinary health care since the 1980’s, when the first technician programs came about; the first veterinary technology programs were called Animal Heath Technology Programs (Francis & Sonsthagen, 2006).

With the increase in advancements in computer and on-line technology the need from veterinary technician students has also amplified itself. Computers have given the American public the flexibility to access the World Wide Web any time of the day or night, and any day of the week. This flexibility of on-line access has added a huge benefit to those AVMA accredited programs with on-line degree/certificate options.
(Hancock, 2006). The program students now have the availability to attend classes whenever they are available, and listen to or watch lectures at the student’s own convenience. This also allows the veterinary technician student to work, attend school and have a home life with in the scope of the student’s time frame not the instructors. The on-line or distance education veterinary technician program has given students a variety of options in the progress of their education and this has allowed veterinary facility owners to hire qualified and educated personnel who can balance work, life and attend school all at the same time (Hancock, Schubert, & Flora, 2006). The goal of any veterinary technician program is to make sure that program graduates are prepared to meet the demands of veterinary health care (Francis & Sonsthagen, 2006).

Online learning does not come at an easy price for either the instructor or the student. Program attendees find themselves needing an increase in self-discipline as well as a vast knowledge of the computer and excellent written and electronic communication skills (Hancock, Schubert, & Flora, 2006). Veterinary technician students are required to have access to the internet, and meet the specific program requirements (i.e. computer programs, chat room hours, and in some cases video recording capability).

Finding instructors to teach the distance education veterinary technician programs is also a difficult task. Not only do these instructors have to be computer savvy, but they have to be willing to create an entire course curriculum for the internet (Hancock, Schubert, & Flora, 2006). Distance education instructors must have excellent written, verbal, and electronic communication skills; the educators ought to be knowledgeable in a variety of computer programs to create lectures, as well as have unlimited access to the internet. Distance education veterinary technician programs are becoming more
prominent in the veterinary technology education field; they offer a colossal benefit to not only the pet owner and society but the veterinary health care team professional, and most importantly the animal’s health and well being (Hancock, Schubert, & Flora, 2006).

“Advancements in veterinary care have led to a high demand for veterinary-care providers with advanced training” (de Laforcade, Morrissey, Rowell, & Schwartz, 2005, p. 366). This is putting a tremendous strain on the 120 plus AVMA accredited veterinary technician programs to continually produce qualified and knowledgeable graduates. With the vast shortage of trained and educated veterinary professionals, we are seeing a scarcity in those seeking to further their educations with a degree or a certificate from an AVMA accredited veterinary technician program. The credentialed veterinary technician’s role in the veterinary facility is enormous; these professionals are responsible for not only the responsibilities listed earlier, they are responsible for minimizing the veterinarian’s involvement in technical tasks (de Laforcade, Morrissey, Rowell, & Schwartz, 2005). This freedom of time allowed the licensed veterinarian to have a better use of his / her time to perform those specific tasks that are outlined by the AVMA; diagnose diseases, prescribe out medications, and perform surgeries.

In one study performed by de Laforcade et al, they found that of the licensed veterinarians surveyed 64% were interested in hiring a veterinary technician with some advanced training. And of the credentialed veterinary technicians surveyed, 93% were interested in pursuing some form of advanced training; and when questioned about the reasons to the benefits of the advanced training 67% said their focus was on educational development (de Laforcade, Morrissey, Rowell, & Schwartz, 2005). This goes to show veterinary technician program graduates are looking for more in their careers than just the
almighty dollar. Graduates are seeking rewards that reach beyond the realm of the veterinary facility; they are focusing on their future goals, and most importantly their educational potential and what they will have to offer their prospective employers.

Veterinary technician program graduates are eligible to be tested for competency for credentialing through examinations, such as the Veterinary Technician National Examination (VTNE) and state examinations (BLS, 2007a). And according the American Veterinary Medical Association (AVMA) all of the accredited veterinary technology programs must meet the same standards of not only accreditation but education (AVMA, 2006). This criterion is what assists the veterinary technician educator in creating a curriculum that is the same from the East coast to the West coast; thus allowing program graduates to have the opportunity at equivalent educations at any AVMA accredited school. This uniformity also permits licensed veterinarians the ability to hire qualified and educated personnel, that have comparable and equivalent educations and training; so there is no doubt about the skill set or skill level these graduates will be entering their veterinary facility with.

Standards Movement

Smith defines standards as “...written statements about what is valued in a field of study that can be used for making a judgment of quality” (Smith, 1998, p. 24). Technology based programs that have to prove their significance require educational standards which are essential to the instruction (Spoerk, 2005). Mino et al states that “for the first time in the history of education, we have a set of standards that identifies what students should know and be able to do as contributing members of our technological
society” (Mino, Kane, & Novak, 2001, p. 30). Curriculum in technology education needs to be standards based to maintain equality between the different technology programs. Students, instructors, and administrators need to be on the same page and performing the same tasks when it comes to standards based technology education (Spoerk, 2005). Veterinary technology programs, which are accredited by the American Veterinary Medical Association’s Committee on Veterinary Technician Education and Activities (AVMA/CVTEA), strive to accomplish this uniformity by holding their curriculum to the essential skills list.

The paramount idea about standards based education is that it creates an environment to insure an ideal curriculum throughout technology based programs. What needs to be pointed out is that technology based education is based on certain universal ideas (Consensus toward standards for technical education, 1997). These standards while maintaining a consistency still allows for a uniqueness in curriculum, which according to Mino et al, is a critical component to this teaching style (Mino, Kane, & Novak, 2001). This individuality can be seen in the over 120 AVMA accredited veterinary technology programs in the United States. Although the curriculums are not exactly the same, they are still held to the same level of the standards based education utilizing the AVMA/CVTEA essential skills list.

Summary of the Review of Literature

Underutilization, low pay, and poor working conditions are the major reasons credentialed veterinary technicians are leaving the veterinary workforce (Leff, 2006). Educated and knowledgeable credentialed veterinary technicians are in high demand
across the United States, and Dr. Leff states that there are 5-8 positions available for veterinary technician accredited program graduates (2006). This demand only increases the underutilization of technicians, as well as the employment of uneducated and untrained veterinary personnel.

The Bureau of Labor Statistics documents the average salary of veterinary technicians at $12.88/hour which is approximately $26,000/year (BLS, 2007b). One of the major reasons for employee turnover in veterinary facilities is due to low pay, and with annual salaries of $26,000/year veterinary facility owners need to maintain competitive salaries to keep qualified and educated veterinary personnel.

Maintaining a standards based education among accredited programs is the desire of the American Veterinary Medical Association’s Committee on Veterinary Technician Education and Activities (AVMA, 2007a). This task is accomplished by maintaining the equality of education by utilizing the essential skills list, which is the required curriculum for accredited veterinary technology programs.
CHAPTER THREE

METHODOLOGY

Introduction

The purpose of this descriptive study was to determine the perceptions of the Associate of Applied Science graduates of the Veterinary Technology program at the College of Southern Nevada on their preparedness for and utilization in the veterinary workforce. These graduates completed an accredited program which follows the guidelines on the essential and recommended skills list identified and approved by the American Veterinary Medical Association's Committee on Veterinary Technician Education and Activities. As part of program improvement, students who have graduated since 2005 have been surveyed to find out utilization and workforce preparedness. There is a massive need for credentialed veterinary technicians in the state of Nevada. Dr. Gary Leff states that underutilization is the major reason that veterinary technicians are leaving the veterinary workforce today (Leff, 2006). Dr. Leff also states that for every one graduate from an accredited veterinary technology program there will be 5-8 positions available in the veterinary workforce (Leff, 2006).

Research Questions

This study was guided by the following questions:
1. What are the perceptions of the College of Southern Nevada Associate of Applied Science veterinary technology program graduates regarding their preparation for the veterinary workforce (Graduating classes since 2005)?

2. How are the College of Southern Nevada (CSN) Associate of Applied Science (AAS) veterinary technology program graduates being utilized in the workforce (Graduating classes since 2007)?

Instrument

Associate of Applied Science Veterinary Technology Program graduates from 2005 and 2006 from the College of Southern Nevada were asked on an annual graduate follow-up survey to rank how they perceived their workforce preparation in seven content areas using a most/least measurement scale (See Appendix B). The graduates from 2007 were mailed an instrument that was modified from those which were sent out to the 2005 and 2006 graduates. Although it also evaluated their perceptions on how well they felt they were prepared in the content areas, the new instrument also collected data on how they were utilized in the workforce. The content areas represented the nine major areas identified by the American Veterinary Medical Association Committee on Veterinary Technician Education and Activities using a Likert scale of 0-10 (See Appendix C). Data is reported in two specific tables because of the adjustment made to the 2007 instrument. It is important to note that although the instrument was modified, the curriculum has not been adjusted since 2005 as the curriculum reflects the major areas identified by the American Veterinary Medical Association Committee on Veterinary Technical Education and Activities.
The nine areas of interest identified by the AVMA/CVTEA are: facility operations, pharmacology and toxicology, nursing procedures, anesthesia, surgical nursing, laboratory skills, imaging, laboratory animal procedures, and avian, exotic small mammal and fish procedures.

Population and Data Collection

Secondary data was utilized in this study. A Social/Behavioral Institutional Review Board (IRB) exempt approval was obtained from the University of Nevada, Las Vegas' Office for the Protection of Research Subjects (OPRS) on April 17, 2008 and the approval number was OPRS #0802-2646. As part of program improvement and assessment for Associate of Applied Science in Veterinary Technology program surveys are mailed to graduates of the program annually to determine their perceptions of their preparation for the workplace and which skills are most utilized in the veterinary workforce. Surveys for the program graduates from 2005 and 2006 only included questions regarding their level of perception of preparedness for the veterinary workforce utilizing a most/least scale. In 2007, the instrument was modified to meet the needs of the veterinary technology program and now includes questions regarding not only perception of preparedness but utilization in the veterinary workforce utilizing a Likert scale of 0-10. Follow-up surveys have only been mailed to graduates since receiving accreditation in 2006 (including graduates from 2005).

Assessing student learning outcomes is an assessment requirement for the College of Southern Nevada as well as a requirement by the American Veterinary Medical Association Committee on Veterinary Technician Education and Activities for
accreditation purposes. This follow-up survey allows for the evaluation of the program curriculum as well as the assessment of student learning outcomes.

Data Analysis

Descriptive statistics, specifically percentages and frequencies were utilized to report the findings of the follow-up surveys. Demographic data will also be reported to describe the population.

Summary

The purpose of this descriptive study was to determine the perceptions of the Associate of Applied Science graduates of the Veterinary Technology program at the College of Southern Nevada on their preparedness for and utilization in the veterinary workforce. These graduates completed an accredited program which follows the guidelines on the essential and recommended skills list identified and approved by the American Veterinary Medical Association's Committee on Veterinary Technician Education and Activities. Follow-up surveys have only been mailed to graduates since receiving accreditation in 2006 (including graduates from 2005). Surveys for the program graduates from 2005 and 2006 only included questions regarding their level of perception of preparedness for the veterinary workforce utilizing a most/least scale. In 2007, the instrument was modified to also include questions about utilization in the veterinary workforce utilizing a Likert scale of 0-10. This follow-up survey allows for the evaluation of the program curriculum as well as the assessment of student learning outcomes.
CHAPTER FOUR

FINDINGS OF THE STUDY

Introduction

The purpose of this descriptive study was to determine the perceptions of the Associate of Applied Science graduates of the Veterinary Technology program at the College of Southern Nevada on their preparedness for and utilization in the veterinary workforce. These graduates completed an accredited program which follows the guidelines on the essential and recommended skills list identified and approved by the American Veterinary Medical Association's Committee on Veterinary Technician Education and Activities.

Results from surveys sent out to the graduates from 2005, 2006 and 2007 are reported in this chapter. Table 5 includes demographic information about the graduates from the College of Southern Nevada's veterinary technology program. Tables 6-8 contain data from the follow-up surveys mailed to the veterinary technology program graduates from the College of Southern in the years 2005, 2006, and 2007. The data is reported in two separate tables because of the modification to the instrument after the graduation year 2006.

Of the 62 surveys that were mailed out to veterinary technology program graduates in the years 2005-2007, Twenty-seven were returned yielding a return rate of 44%. Each year had separate return rates, but the overall return rate was fairly high. In 2007, the
follow-up graduate survey was modified to meet the needs of CSN’s veterinary technology program by adding questions related to perception of utilization in the veterinary workforce. For assessment purposes, this was necessary.

Research Questions

This study will be guided by the following questions:

1. What are the perceptions of the College of Southern Nevada Associate of Applied Science veterinary technology program graduates regarding their preparation for the veterinary workforce (Graduating classes since 2005)?

2. How are the College of Southern Nevada (CSN) Associate of Applied Science (AAS) veterinary technology program graduates being utilized in the workforce (Graduating classes since 2007)?

Characteristics of CSN’s Veterinary Technology Graduates

Table 5 reports demographic data about the veterinary technology program graduates from the College of Southern Nevada. The data reported includes information about age, salary and whether they were licensed. As one can see, there were two program graduates from 2005 who did not include data for their salary. These graduates reported they were either unemployed or not employed in the veterinary field. One graduate from 2007 reported an annual salary of $0 as this graduate was unemployed. The term credential is used to describe those graduates who also passed the state and/or national licensing examination but does not specify which credentialing they obtained.
Table 5. Demographic Data from the College of Southern Nevada’s veterinary technology program graduates from 2005-2007.

<table>
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<tr>
<th>Year</th>
<th>Age</th>
<th>Sex</th>
<th>Location</th>
<th>Annual Salary</th>
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<td>F</td>
<td>Iowa</td>
<td>$18,000-20,999</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>&gt;46</td>
<td>F</td>
<td>Nevada</td>
<td>$27,000-29,999</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>26-30</td>
<td>F</td>
<td>Nevada</td>
<td>$18,000-20,999</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>41-45</td>
<td>F</td>
<td>Nevada</td>
<td>&gt; $50,000</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>26-30</td>
<td>F</td>
<td>Nevada</td>
<td>$24,000-26,999</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>41-45</td>
<td>F</td>
<td>Nevada</td>
<td>$15,000-17,999</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>26-30</td>
<td>M</td>
<td>Nevada</td>
<td>$24,000-26,999</td>
<td>No</td>
</tr>
<tr>
<td>2007</td>
<td>&lt;21</td>
<td>F</td>
<td>Nevada</td>
<td>$30,000-32,999</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>36-40</td>
<td>F</td>
<td>Nevada</td>
<td>$27,000-29,999</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>31-35</td>
<td>F</td>
<td>Nevada</td>
<td>$0 (Unemployed)</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>26-30</td>
<td>M</td>
<td>Nevada</td>
<td>$27,000-29,999</td>
<td>Missing</td>
</tr>
<tr>
<td></td>
<td>22-25</td>
<td>F</td>
<td>Nevada</td>
<td>$27,000-29,999</td>
<td>Yes</td>
</tr>
</tbody>
</table>

As noted in Table 5 the majority of the graduates were female and were working in Nevada. One program graduate reporting working in another state. Although specific salary cannot be reported because salary was reported in ranges, the majority of graduates earned between $24,000 and $29,999 annually.
Around 70% (19 out of 27) of the veterinary technology program graduates reported that they were in someway credentialed in the state where they are employed. Twenty-six percent (7 out of 27) of program graduates reported they were not credentialed, and 4% (1 out of 27) not providing any information regarding their credentialing.

Results of the 2005-2007 Surveys

Table 6 represents responses from 2005 and 2006 College of Southern Nevada Associate of Applied Science veterinary technology program graduates. Graduates were asked to evaluate their perceptions utilizing a scale of most and least in seven content areas in their program. Along with the seven content areas, the graduates were also asked to evaluate their perception of preparedness for their first job in the veterinary workforce using a 4 point scale: very well prepared (VW), well prepared (W), somewhat prepared (S), and poorly prepared (P).

In 2005, a total of twenty-eight surveys were mailed out to program graduates with eleven returned yielding a return rate of 39%. In 2006, a total of twenty-one surveys were mailed out to program graduates with eleven returned yielded a return rate of 52%.
Table 6. Perceptions of CSN Veterinary Technology Program Graduates on Their Level of Preparation in the Major Curricular Areas by Graduation Year.

<table>
<thead>
<tr>
<th>Major Curricular Areas Identified by Standards</th>
<th>2005 N=28; n=11</th>
<th>2006 N=21; n=11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Preparation</td>
<td>Least</td>
<td>Most</td>
</tr>
<tr>
<td>Facilities</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Pharmacology/Toxicology</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Surgical Nursing</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Laboratory Skills</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Imaging</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>First Job Preparation</td>
<td>VW</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: N=total number of graduates for that year. n=number of those graduates who returned surveys.

In regards to the seven content areas, most of the graduates felt they were most prepared in all but a few (Pharmacology/Toxicology in 2005 & 2006 and in Laboratory skills in 2006). Of those who responded in 2005, 100% of veterinary technology program graduates of the CSN veterinary technology program felt they were well or very well prepared for their first job in the veterinary workforce. Of those graduates who responded to the survey in 2006, 91% of graduates perceived they were well or very well prepared for their first job; while 18% felt they were somewhat prepared for their first job in the veterinary workforce.

An open ended question was included in the questionnaire to solicit any additional remarks about the program. Some of the remarks from the 2005 and 2006 surveys are listed below.

"Before completing the [veterinary technology] program, I had the ‘how’ we do things. Now, not only do I have the ‘how’ but I have the ‘why’- I feel that completing this program was one of the best things I could have done for myself as a veterinary technician."
"I am very pleased with the training I received from [the College of Southern Nevada]...I look forward to going to work every day and I'm so thankful for Dr. Olsen, Jenna, and Melissa for helping me learn and achieve a great education as well as a way to earn a living by doing something I love so much."

"I got well prepared for the National test from this program. I also feel that I learned a lot that prepared me for my job."

"I am amazed at how much I have learned, but more importantly, how much of that knowledge I have retained."

Table 7 represents responses from 2007 College of Southern Nevada Associate of Applied Science veterinary technology program graduates. A total of 13 surveys were mailed out and 5 were returned yielding a return rate of 39%. Graduates were asked to evaluate their perceptions utilizing a scale from 0-10 in the nine content areas of their program which were identified by the American Veterinary Medical Association Committee on Veterinary Technician Education and Activities. The data represents the mean score of those who responded.

Table 7. Perceptions of CSN Veterinary Technician Graduates on Their Level of Preparation in the Major Curricular Areas for Graduation Year 2007.

<table>
<thead>
<tr>
<th>Major Curricular Areas Identified by Standards</th>
<th>Level of Preparation on a Scale of 1-10 (Mean Score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities</td>
<td>8.6</td>
</tr>
<tr>
<td>Pharmacology/Toxicology</td>
<td>9</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>10</td>
</tr>
<tr>
<td>Nursing</td>
<td>9.6</td>
</tr>
<tr>
<td>Surgical Nursing</td>
<td>10</td>
</tr>
<tr>
<td>Laboratory Skills</td>
<td>9</td>
</tr>
<tr>
<td>Imaging</td>
<td>10</td>
</tr>
<tr>
<td>Laboratory Animals</td>
<td>8.4</td>
</tr>
<tr>
<td>Exotic Animals</td>
<td>7</td>
</tr>
</tbody>
</table>

Note: N=total number of graduates for that year.
n=number of those graduates who returned surveys.
In general, graduates’ perceived their level of preparedness in the major curricular areas were high except their knowledge of exotic animals which had a mean score of 7. Anesthesia, Surgical Nursing, and Imaging had a mean score of 10 which indicates that students felt they were very well prepared in those content areas.

Open ended questions were also included in the modified survey except students were asked to comment after they rated each content area. Some of the responses are listed below.

“Thanks to the program, I know more about anesthesia than other coworkers!” [Anesthesia]

“Every clinic/hospital is different, but knowing the gold standard helped me to adapt to new environments.” [Facilities]

“I am now able to better assist my doctor in properly prescribing and dispensing medications.” [Pharmacology and Toxicology]

“The program was very stern on documenting, dispensing drugs, etc. We always were taught to be thorough for this area.” [Pharmacology and Toxicology]

Table 8 also represents responses from the 2007 graduates however, these questions represent their perceptions of how they were currently being utilized in the veterinary workforce at the time they completed the survey. Graduates were asked to rate how they were utilizing their skills in the nine content areas of their program on a scale of 0-10.
Table 8. Perceptions of CSN Veterinary Technician Graduates on Their Level of Utilization in the Major Curricular Areas for Graduation Year 2007.

<table>
<thead>
<tr>
<th>Major Curricular Areas Identified by Standards</th>
<th>Level of Utilization on a Scale of 0-10 (Mean Score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities</td>
<td>6.25</td>
</tr>
<tr>
<td>Pharmacology/Toxicology</td>
<td>7.5</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>7.5</td>
</tr>
<tr>
<td>Nursing</td>
<td>7.25</td>
</tr>
<tr>
<td>Surgical Nursing</td>
<td>7.5</td>
</tr>
<tr>
<td>Laboratory Skills</td>
<td>9</td>
</tr>
<tr>
<td>Imaging</td>
<td>8.75</td>
</tr>
<tr>
<td>Laboratory Animals</td>
<td>1</td>
</tr>
<tr>
<td>Exotic Animals</td>
<td>1.5</td>
</tr>
</tbody>
</table>

N=13; n=4; 1 missing

Note: N=total number of graduates for that year.
   n=number of those graduates who returned surveys.

The responses in general show that graduates are underutilized in the veterinary workforce. Only 4 responses were calculated in the mean score because one respondent listed “not applicable (n/a)” in this section because they were currently not employed in the veterinary workforce.

Noticeably, the Laboratory and Exotic Animals content areas were areas in which graduates were extremely underutilized in the workforce. Those areas scored a mean of 1 and 1.5 respectively. Contrary, graduates reported higher than average utilization in Facilities, Pharmacology and Toxicology, Anesthesia, Nursing, Surgical Nursing, Laboratory skills and Imaging.

Open ended questions were also included in this section and respondents were asked to comment on their utilization after they rated each content area. Some of the responses are listed below.

"My doctor feels that she is the expert in these areas and she needs no help.”
-Facilities
“There is very little trust in my clinic and I am working on changing things.”
[Nursing]

Overall, comments about the program were also provided. They are:

“The veterinary technology program I graduated from has taught me a lot. It also helped me to better assimilate new knowledge with my past experience. I could not have had a better source for theoretical knowledge.”

The [College of Southern Nevada veterinary technology] program is great preparing you for the job to be done.”

“Overall, I am very confident in my abilities thanks to the CSN veterinary technology program. Many a time, I’ve even surprised myself with how much I knew!”

Summary

The results reported in this chapter show that students overall perceived that they were very well prepared for the veterinary workforce however, how much of the skills for which they were trained are not being utilized at high rates in the workforce. Dr. Gary Leff (2006) from the American Veterinary Medical Association states that credentialed veterinary technicians are leaving their positions in the veterinary workforce because of underutilization, low pay, and poor working conditions. The results concur with the literature.

Discussions on the impact to the veterinary field, as well as recommendations, are to follow.
CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Discussion of Results

The purpose of this descriptive study was to determine the perceptions of the
Associate of Applied Science graduates of the Veterinary Technology program at the
College of Southern Nevada on their preparedness for and utilization in the veterinary
workforce. These graduates completed an accredited program which follows the
guidelines on the essential and recommended skills list identified and approved by the
American Veterinary Medical Association's Committee on Veterinary Technician
Education and Activities.

The researcher notes some interesting trends in the data. Veterinary technology
program graduates from 2005 and 2006 felt they were not as prepared for the veterinary
workforce in the major content areas of their program specifically in Pharmacology and
Toxicology. However, both graduating classes considered they were most prepared for
the veterinary workforce in the content areas of Surgical Nursing, Nursing, and
Anesthesia. The graduates from 2005 reported mixed feelings about their level of
preparedness for the workforce in the content areas of Laboratory Skills and Facilities as
can be seen by the variance in responses. In the major area of Imaging, graduates from
the year 2005 felt they were most prepared for the veterinary workforce.
The 2007 graduates’ responses were averaged together and their means reported to assess preparedness and utilization. Based on the responses from the 2007 graduates, they felt they were least prepared in the area of Exotic Animals. However, the responses from the 2007 program graduates indicated they felt they were most prepared in the major areas of Anesthesia, Surgical Nursing, and Imaging by responding with a 10.

In terms of utilization, most of the 2007 graduates of the veterinary technology program felt they were utilized better than average in the veterinary workforce. However, in two of major curriculum areas, Laboratory Animals and Exotic Animals, the graduates felt severely underutilized. Because of the small sample size of this study, more data needs to be collected before a firm conclusion can be made. Dr. Gary Leff (2006), from the American Veterinary Medical Association states that the major reason veterinary technicians are leaving the profession is due to their underutilization; however, this determination cannot be made from this study because of the small sample size. Further data collection and monitoring of graduates is needed.

The demographic data that was reported by the 2005, 2006 and 2007 veterinary technology program graduates is specialized to the College of Southern Nevada and cannot be generalized to other programs in the state of Nevada or other AVMA accredited veterinary technology programs. Of the graduates who responded to the survey, 96% reported that upon graduation they gained employment in the state of Nevada, only 4% moved outside the state. Graduates also reported on the survey their salaries were in the range reported by the Bureau of Labor Statistics (2007b) data averaging between $24,000 - $29,999 per year.
Overall, the curriculum at the College of Southern Nevada is preparing the veterinary technology graduates for the veterinary workforce. Based on the responses from the graduates, minor adjustments to the curriculum at the College of Southern Nevada should be made and discussions are now taking place. No major decisions about curriculum can be made at this time as the researcher will continue to monitor follow-up with graduates of the program through surveys and trends will be monitored before such decisions are made. A discussion of suggested modifications will follow in the recommendations subsection.

Recommendations

Based on the responses received from the annual follow-up graduate surveys it is recommended that minor adjustments to the veterinary technology program be made. An increase in didactic lecture hours for specific courses as well as an increase in laboratory exposure hours should be included in the program changes. An increase in the amount of adjunct personnel with more specialized skills is also a suggested modification to the veterinary technology program at the College of Southern Nevada.

Curriculum modifications are already in the planning stages for the 2010 fall semester at the College of Southern Nevada. At the time of this study, specific adjustments are awaiting program, department, and college approval. It is recommended the instructor for the Laboratory Skills courses be changed to a specialty veterinarian who is a Diplomat of Clinical and Laboratory Animal Medicine (DCLAM). This veterinarian will bring their expertise in the field of Clinical and Laboratory Animal Medicine to the program staff at the College of Southern Nevada. Diplomats in this field are highly trained in the areas of
clinical and laboratory animal medicine beyond the four years spent earning their veterinary doctorates. Included in these recommendations is the need to add on more adjunct personnel with more specialized skills including veterinarians and credentialed veterinary technicians with the skills to teach courses in the veterinary technology program at the College of Southern Nevada.

It is also recommended more time be allotted for the hands-on portion of veterinary technology courses. This increases the amount of time the students will spend in the laboratory, as well as adding laboratory course work to courses that do not currently have laboratory hours. The final program modification recommendation is to increase the number of didactic lecture hours in some program coursework. This is a minor program curriculum change, and can be easily implemented into the veterinary technology program coursework.

It is recommended to make modifications to strengthen the current 2007 graduate follow-up survey. The researcher recommends creating a survey that is more user friendly. Recommendations to the current format of the graduate follow-up survey are as follows: asking utilization and preparedness in the same question and creating a table with all nine major content areas will allow graduates to respond to one question instead of 18 questions. Decreasing the amount of questions asked on this annual survey will also create an instrument that is shorter in length which is easier for a potential responder to complete. The researcher is hoping to decrease the length of the survey by two-thirds; instead of being 9 pages it is recommended to decrease the instrument to 3 pages. This will assist with the data retrieval process and documentation of information received from the surveys. The final recommendation to the format of the graduate survey is to add
quantification to the number values associated with perception. Currently the survey asks the graduates to rate their perception on a scale of 0-10 but there is no way to know the difference between a 3 or a 4; it is recommended use a Likert scale of 0-5 which will add quantification to each value. It can also be suggested to give examples of each value and include that with the survey.

Curriculum in the College of Southern Nevada’s veterinary technology program is constantly evaluated on a semester basis. It is recommended the curriculum be reviewed to add more semester didactic lecture hours, specialty instructors and additional laboratory hours to the above mentioned courses. There is not enough data to support these changes however, the program will continue to monitor the results from the College of Southern Nevada’s veterinary technology program annual follow-up graduate surveys and adjust program curriculum and faculty accordingly.

Finally, it is recommended that the veterinary technology program institute an exit interview process for all program graduates. Instituting such a process will provide program advisors with immediate perceptions of preparedness of graduates and what they expect before entering the veterinary workforce. It will also allow the administrators in the program to prepare veterinary technology program graduates to expect the annual follow-up graduate survey within 6 months of their graduation and to inform them of the value of their input and for what the results will be used. The exit interview process will also permit the veterinary technology program advisors to find out the future endeavors of the program graduates and possibly guide them with their choices.

In terms of further research, it is recommended that a study which examines the expectations of, value for and utilization of veterinary technicians from the employer’s
perspective is seen as valuable for institutions who prepare this workforce. The value of understanding the employer’s need is a basic principle for technical educators. Additionally, studying how credentialed technicians are utilized in the workforce from the employer’s perspective would complement this study and the monitoring CSN Veterinary Technology Program does of their graduates. Part of the mission statement of the College of Southern Nevada is to make sure programs are meeting the needs of the community and businesses of Southern Nevada and by surveying veterinary employers this can be evaluated in the field of veterinary technology.

The researcher concedes the results of the veterinary technology program graduates’ follow-up survey cannot be generalized to all accredited veterinary technology programs or other veterinary technology programs in the state of Nevada but rather, the data generated can only be used to describe the graduates of the College of Southern Nevada’s veterinary technology program. The survey results from 2005 through 2007 allowed the researcher to gain a baseline value for perceptions of preparation for and utilization in the veterinary workforce. It is suggested to further follow this reported data, and expand the research to the veterinary technology programs in the state of Nevada as well as all American Veterinary Medical Association (AVMA) accredited veterinary technology programs for thorough reporting. Utilization and preparedness at the College of Southern Nevada will be continuously monitored and continuation of the work will be the goal of the researcher towards other educational ventures.
APPENDIX A

ESSENTIAL AND RECOMMENDED SKILLS LIST

Required tasks are denoted by an asterisk (*).
Italicized text denotes hands-on (psychomotor) skills; all other text denotes didactic (knowledge-based) skills
Skills that may be performed in a group setting are indicated by the symbol [GROUP]

1. OFFICE AND HOSPITAL PROCEDURES, CLIENT RELATIONS, and COMMUNICATION

Management

Skill: Participate in facility management utilizing traditional and electronic media and appropriate veterinary medical terminology and abbreviations.

Tasks:

Schedule appointments, admit, discharge and triage according to client, patient and facility needs through phone and in-person contact*

Recognize and respond to veterinary medical emergencies*

Create and maintain individual client/patient records, vaccination certificates, and other appropriate forms*:

  o develop computer skills*
  o be able to utilize common management software programs*
  o be familiar with veterinary on-line services*

Perform basic filing of medical records, radiographs, lab reports, etc.*

Create and maintain all appropriate facility records and logs in compliance with regulatory guidelines (e.g., x-ray, surgery, anesthesia, laboratory, controlled substance)*

Manage inventory control*

Recognize roles of appropriate regulatory agencies*
Maintain appropriate disposal protocols for hazardous materials*

Establish and maintain appropriate sanitation and nosocomial protocols for a veterinary facility, including patient and laboratory area*

Handle routine financial transactions*

**Decision-making abilities:** Taking into account the characteristics of the facility, patients and clients, the veterinary technician will effectively contribute to the professional and efficient operation of the facility in order to provide maximum benefits to clients, patients, and the facility.

**Communication**

**Skill:** Communicate in a professional manner in all formats - written, oral, non-verbal, and electronic.

**Tasks:**

Apply understanding of interpersonal skills and team dynamics in all aspects of team dynamics*

Utilize appropriate interpersonal and public relations skills*

Demonstrate telephone etiquette*

Recognize the legality of the veterinary-client-patient relationship*

Develop and provide client education in a clear and accurate manner at a level the client understands (i.e., oral and written form, including educational handouts)*

Apply crisis intervention/grief management skills with clients*

**Decision-making abilities:** Taking into account the patient, client, staff and circumstances, the veterinary technician will effectively and accurately acquire and convey information utilizing an appropriate communication mode.

**Laws and Ethics**

**Skill:** Follow and uphold applicable laws and the veterinary technology profession's ethical codes to provide high quality care to patients.

**Tasks:**

Understand and observe legal boundaries of veterinary health care team members*
Interact professionally with clients and fellow staff members*

Demonstrate a commitment to high quality patient care*

Respect and protect the confidentiality of client and patient information*

**Decision-making abilities:** Given knowledge of legal limitations and applicable ethical standards, the veterinary technician will carry out her/his duties within appropriate legal boundaries and maintain high ethical standards to provide high quality service to clients, patients, employers and the veterinary profession.

2. **PHARMACY and PHARMACOLOGY**

**Administration**

**Skill:** Safely and effectively administer prescribed drugs to patients.

**Tasks:**

Prepare medications; label and package dispensed drugs correctly*

Read and follow veterinarian's pharmacy orders*

Recognize groups of drugs, their mechanisms, and clinically relevant side effects*

Recognize the safe and effective manner in which vaccines must be administered; recognize and explain common side effects*

Accurately perform appropriate calculations; use weights and measures correctly*

Safely and effectively administer drugs by common parenteral and enteral routes; be able to explain appropriate routes and methods and when used*

Monitor therapeutic responses*

Demonstrate the ability to accurately record medical information*

Demonstrate understanding of regulations governing maintenance of controlled substances log book*

Demonstrate compliance with all federal regulatory guidelines for drug purchase, storage, administration, withdrawal, dispensing, disposal, and inventory control (e.g., biologics and therapeutic agents, pesticides, and hazardous wastes)*

**Decision-making abilities:** Given the characteristics of the patient, the instructions of the veterinarian and the medication to be used, the veterinary technician will calculate the
correct amount of medication in the prescribed form and administer it by the prescribed route to maximize therapeutic benefits and minimize the potential for adverse effects. The veterinarian technician shall also be able to differentiate between abnormal and normal responses to medication.

**Dispensing**

**Skill:** Accurately dispense and explain prescribed drugs to clients.

**Tasks:**

Given a drug order, properly prepare medications for dispensing, including performing accurate calculations*

Demonstrate compliance with regulations governing prescription drugs versus over-the-counter drugs*

Demonstrate understanding of regulations governing maintenance of controlled substances log book*

Demonstrate compliance with all federal regulatory guidelines for drug purchase, storage, administration, withdrawal, dispensing, disposal, and inventory control (e.g., biologics and therapeutic agents, pesticides, and hazardous wastes)*

Relay drug information to clients (e.g., handling, storage, administration, side-effects, drug interactions, safety, reasons for use of drug)*

**Decision-making abilities:** Given the characteristics of the patient, the instructions of the veterinarian and the medication to be used, the veterinary technician will (1) accurately calculate and dispense the correct form and dose of medication and (2) communicate necessary client information in order to maximize safety, compliance with prescribed therapy and successful treatment of the patient. The veterinary technician should also be proficient at performing inventory control procedures.

3. **NURSING**

**Patient assessment**

**Skill:** Demonstrate and perform patient assessment techniques in a variety of animal species.

**Tasks:**

Recognize common domestic animal species and breeds*

Describe and use common animal identification methods*
Demonstrate effective and appropriate restraint techniques for various animal species:

- properly restrain dogs and cats for procedures
- encage and remove small animals from cages
- apply dog muzzle safely
- apply Elizabethan collar
- use restraint pole and other restraint aids
- halter, tie, and lead horses
- restrain birds
- restrain pocket pets and exotics
- restrain cattle and horses
  - apply twitch (horses)
  - apply bovine tail restraint
- restrain sheep and swine
- load large animals

Obtain a thorough patient history

Demonstrate the ability to obtain objective patient data:

- temperature (dog, cat, horse, cow)
- pulse (dog, cat, horse, cow)
- respiration (dog, cat, horse, cow)
- auscultate heart/lungs
- assess hydration status

Properly collect diagnostic specimens for analysis (ex: urine, blood, feces, specimens for cytology)

Perform venipuncture:

- cephalic (dog, cat)
- jugular (dog, cat, horse, ruminant)
- saphenous (dog)
- medial femoral (dog, cat)
- sublingual (dog)
- ear (swine, rabbit)
- coccygeal (cow)
- anterior vena cava (pig)

Collect urine sample:

- catheterize male* and female dogs
- catheterize female cat
- catheterize male cat
- collect voided urine sample (small animal)
perform cystocentesis (small animal)*[GROUP]

- catheterize large animal

Prepare diagnostic specimens for shipment*

**Decision-making abilities:** Given the characteristics of the patient, the veterinary technician will safely and efficiently obtain subjective and objective patient data that will allow accurate evaluation of the patient's physical status with minimum stress and maximum safety.

**Patient care**

**Skill:** Understand and demonstrate husbandry, nutrition, therapeutic and dentistry techniques appropriate to various animal species.

**Tasks: Husbandry**

Grooming:

- perform therapeutic bathing, basic grooming, and dipping of small animals*
  - trim nails (dogs, cats, birds, exotic/special species)*
  - trim hooves (ruminant, horses)
  - apply equine tail and leg wraps*
  - express canine anal sacs*
  - clean and medicate ears (dog, cat)*
  - clean sheath (horse)

**Environmental conditions: implement sanitation procedures for animal holding and housing areas**

Demonstrate understanding of permanent identification*

Demonstrate understanding of breeding/reproduction techniques*

Demonstrate understanding of care of orphan animals

Demonstrate understanding of nursing care of newborns*

**Decision-making abilities:** Given the characteristics of the patient, the veterinary technician will implement appropriate husbandry techniques to enhance wellness and reduce risk of disease, injury and stress.

**Tasks: Nutrition**

58
Understand life stage energy and nutrient requirements of well animals (dog, cat, horse, cow)*

Identify common grains and forages

Understand key nutritional factors in disease conditions*

be familiar with therapeutic foods*

Understand current developments in nutritional supplements and additives including benefits and potential toxicities*

Understand and identify substances that when ingested result in toxicity:

identify common poisonous plants*

be familiar with substances (organic and inorganic) that cause toxicity*

Develop and communicate hospital nutrition protocols*

**Decision-making abilities:** Given the characteristics of the patient, the veterinary technician will understand appropriate and inappropriate dietary components for various life stages and therapeutic regimens (e.g., therapeutic foods) in order to promote optimal health, enhance recovery and manage chronic disease conditions. The veterinary technician will also explain nutritional recommendations to clients and reinforce owner compliance.

**Tasks: Therapeutics**

*Administer parenteral medications:*

- subcutaneous*
- intramuscular*
- intradermal
- intraperitoneal
- intramammary (mastitis therapy only)*
- intravenous

*Administer enteral medications:*

- balling gun (ruminant)*
- dose syringe (ruminant, horse)*
- gastric intubation (small animal)*[GROUP]
- hand pilling (dog, cat)*
- gastric lavage (dog)
- dose syringe (pig)
oral speculum and stomach tube (ruminant)
nasogastric intubation (small animal, horse)

Administer topical medications (including eye meds)*

Perform ocular diagnostic tests (including tonometry, fluorescein staining and Schirmer tear test)*

Administer enemas*[GROUP]

Collect/evaluate skin scrapings*

Fluid therapy:

- administer subcutaneous fluids*
- place intravenous catheters (cephalic, saphenous, jugular)*
- maintain and care for catheters*
- determine/maintain fluid infusion rate*
- monitor patient hydration status*
- develop familiarity with fluid delivery systems*

Apply and remove bandages and splints*

Remove casts

Develop understanding of wound management and abscess care*

Perform physical therapy:
  
  hydrotherapy
  post-operative
  orthopedic
  neurological
  explain care of recumbent patient*

Perform critical care:
  
  maintain chest, tracheostomy, pharyngostomy tubes
  
  collect, crossmatch, and give blood transfusions

Apply established emergency protocols:
maintain emergency medical supplies/crash cart*

*perform first aid and cardiopulmonary resuscitation (simulation acceptable)*

*use ambu bag*

*apply emergency splints and bandages*

**Decision-making abilities:** Given the directions of the veterinarian and the characteristics of the patient, the veterinary technician will carry out appropriate therapeutic techniques in order to achieve maximum health benefits for the patient.

**Tasks: Dentistry**

*Perform routine dental prophylaxis (manual and machine)*

Understand client education regarding home care*

Float teeth

Clip teeth

**Decision-making abilities:** Given the characteristics of the patient, the veterinary technician will recognize a patient's dental health status and perform techniques, as prescribed by a veterinarian, appropriate to the species and its condition in order to promote and maintain dental health.

4. ANESTHESIA

**Patient management**

**Skill:** Safely and effectively manage patients in all phases of anesthetic procedures.

**Tasks:**

Calculate dosages of appropriate anesthetic-related drugs*

*Administer anesthetic-related drugs by injection, mask, induction chamber or endotracheal tube*

*Place endotracheal tubes in patients when appropriate*

*Utilize clinical signs and appropriate equipment to monitor patient status in all stages of anesthetic procedures (e.g., esophageal stethoscope, Doppler, pulse oximeter)*

Evaluate patient and implement and evaluate pain management protocols*
Recognize and respond appropriately to patients in compromised states*

Perform appropriate resuscitation procedures as needed (e.g., calculate and administer appropriate anesthetic antagonists and emergency drugs as directed)*

Complete controlled drug log

**Decision-making abilities:** Given the characteristics of the anesthetic patient and the procedure being performed, the veterinary technician will work with the veterinarian to:

1. Assess the patient's risk status and determine appropriate anesthetic and perianesthetic protocols to provide effective pain management and maximum anesthetic safety and effectiveness.
2. Choose and utilize appropriate techniques and equipment to accurately and effectively monitor the patient's ongoing status before, during and after anesthesia to provide for adequate anesthesia, analgesia and a safe recovery.

**Equipment/facility management**

**Skill:** Safely and effectively select, utilize and maintain anesthetic delivery and monitoring instruments and equipment.

**Tasks:**

*Maintain and operate anesthetic delivery and monitoring equipment:*

- pulse oximeter*
- esophageal stethoscope*
- electrocardiograph (e.g., recognize abnormal rhythms/audible sounds, properly apply leads)*
- anesthetic machines, including rebreathing systems, non-rebreathing systems induction chambers and masks*
- endotracheal tubes*
- ambu bag*
- scavenging systems*
- oxygen sources*
- respiratory monitors*
- blood pressure monitoring devices*
- laryngoscopes*
- ventilator
- defibrillator

**Decision-making abilities:**

1. Given the characteristics of the anesthetic instruments and equipment being used, the veterinary technician will recognize and respond appropriately to equipment
malfunctions or inappropriate equipment setup in order to ensure proper function and provide maximum benefit to the patient.

2. Given the requirements of the anesthetic protocol, the veterinary technician will select, evaluate and adjust equipment to ensure proper function and provide maximum benefit to the patient.

5. SURGICAL NURSING

It is essential that technicians have knowledge of routine surgical procedures and related equipment. Direct involvement with all procedures will not be required, but students should have experience with most of those listed. The following procedures are intended to be suggestive of surgical procedures that may be common in a veterinary practice and the technician’s education may not necessarily be limited to the items listed:

- ovariohysterectomy - dogs and cats*
- cesarean section - all common species*
- orthopedic procedures*
- castration - all common species*
- tail docking*
- onychectomy - dogs and cats*
- laparotomies - all common species*
- dystocias in common species*
- dehorning - cattle and goats*
- prolapsed organs - common types, species, and incidence*

Patient management

Skill: Understand and integrate all aspects of patient management for common surgical procedures in a variety of animal species.

Task:

Properly identify patients and surgical procedures*

Decision-making abilities: Given the characteristics of the patient and the surgical procedure to be performed, the veterinary technician will use medical records and patient identification methods to assure that the patient and scheduled procedures are correct.

Task:

Patient assessment

- organize medical records/consent forms*
- review pre-operative evaluation*
evaluate current patient status*
coordinate anesthesia*

**Decision-making abilities:** Given the characteristics of the patient and the surgical procedure to be performed, the veterinary technician will obtain the patient's vital signs, note any specific physical abnormalities, ensure pre-surgical tests have been completed and report the patient assessment to the veterinarian.

**Task:**

*Prepare surgical site using appropriate aseptic techniques* *

**Decision-making abilities:** Given the characteristics of the patient and the surgical procedure to be performed, the veterinary technician will identify the appropriate area of hair to be removed and select appropriate methods to reduce microbial flora on the skin in the area of surgical site in order to decrease the chance of surgical wound contamination.

**Task:**

*Position patient for common procedures* *

**Decision-making abilities:** Given the characteristics of the patient and the surgical procedure to be performed, the veterinary technician will position the patient appropriately to provide maximum convenience for the surgeon and maximum safety and benefit for the patient.

**Task:**

Provide surgical assistance:

- maintain proper operating room conduct and asepsis*
- assist with care of exposed tissues and organs*
- properly pass instruments and supplies*
- operate and maintain suction and cautery machines*
- understand the principles of operation and maintenance of fiber optic equipment*
- keep operative records*
- perform basic suturing techniques

**Decision-making abilities:** Given the characteristics of the patient and the surgical procedure to be performed, the veterinary technician will understand and utilize appropriate aseptic techniques to assist operative personnel in order to provide maximum safety and benefit to the patient.

**Task:**
Coordinate pain management with the anesthesia/surgical team*

**Decision-making abilities:** Given the characteristics of the patient and the surgical procedure to be performed, the veterinary technician will assure that anesthetic and post-operative pain management protocols are appropriate to provide maximum safety and benefit to the patient.

**Task:**

Provide post-operative care:

- pain management*
- fluid therapy*
- adequate nutrition*
- wound management*
- bandaging*
- discharge instructions*
- suture removal* 

**Decision-making abilities:** Given the characteristics of the patient and the surgical procedure to be performed, the veterinary technician will understand and administer the appropriate methods of post-operative care to assure maximum safety and benefit to the patient.

**Procedural management**

**Skill:** Understand and provide the appropriate instruments, supplies and environment to maintain asepsis during surgical procedures.

**Tasks:**

*Prepare surgical instruments and supplies*

*Prepare gowns, masks, gloves, and drapes*

*Operate and maintain autoclaves*

*Sterilize instruments and supplies using appropriate methods*

*Identify and know proper use for instruments*

*Identify common suture materials, types, and sizes*

*Provide operating room sanitation and care*

*Maintain proper operating room conduct and asepsis*
Perform post-surgical clean-up (e.g., equipment, instruments, room, proper disposal of hazardous medical waste)*

Decision-making abilities: Given the characteristics of the patient and the surgical procedure to be performed, the veterinary technician will properly select, wrap and sterilize appropriate instruments and supplies and prepare and maintain the surgical environment to ensure maximum safety and benefit to the patient.

6. LABORATORY PROCEDURES

Specimen management

Skill: Properly package, handle and store specimens for laboratory analysis.

Tasks:

Prepare specimens for diagnostic analysis*
Select and maintain laboratory equipment*
Implement quality control measures*[GROUP]
Ensure safety of patients, clients and staff*

Decision-making abilities:

1. Given the characteristics of the patient and the requested analysis, the veterinary technician will properly prepare, handle and submit appropriate samples for diagnostic analysis in order to ensure maximum accuracy of results.
2. Given the characteristics of laboratory instruments and equipment, the veterinary technician will determine proper maintenance and quality control procedures necessary to ensure accurate results.

Specimen analysis

Skill: Properly carry out analysis of laboratory specimens.

Tasks:

Perform urinalysis:
  o determine physical properties (e.g., color, clarity, specific gravity)*
  o test chemical properties*
  o examine and identify sediment*

Perform CBC:
- hemoglobin*
- packed cell volume*
- total protein*
- white cell count*
- red cell count*

Perform microscopic exam of blood film:

- prepare film and stain using a variety of techniques*
- perform leukocyte differential – normal vs abnormal*
- evaluate erythrocyte morphology – normal vs abnormal*
- estimate platelet numbers*
- calculate absolute values*
- correct white blood cell counts for nucleated cells*

Calculate hematologic indices*

Perform reticulocyte count*

Perform platelet count

Coagulation tests – perform one of the following*: [GROUP]

- buccal mucosal bleeding time
- activated clotting time (ACT)
- prothrombin time (PT)
- partial thromboplastin time (PTT)
- fibrinogen assay

Perform blood chemistry tests (BUN, glucose, common enzymes)*

Perform serologic test (ELISA, slide/card agglutinations)*

Identify blood parasites:

- Dirofilaria sp/Dipetalonema sp – direct, Knotts, filter, antigen kit*
- Haemobartonella sp*
- Anaplasma sp
- Babesia sp
- Trypanosoma sp
- Eperythrozoon sp
- Ehrlichia sp

Perform parasitologic procedures for external parasites and identify:

- mites*
lice*  
ticks*  
fleas*  
flies*

**Perform diagnostics procedures for parasites:**

- direct, Knotts, filter, antigen kit*
- flotation solution preparation
- fecal floatations*
- fecal sedimentation*
- direct smears*
- centrifugation with flotation*
- adhesive tape retrieval of pinworm ova

**Identify common parasitic forms:**

- Nematodes*
- Trematodes*
- Cestodes*
- Protozoa*

**Perform coprologic tests**

**Perform microbiologic procedures/evaluations:**

- collect representative samples*
- culture bacteria and perform sensitivity tests*
- identify common animal pathogens using commercially available media and reagents*[GROUP]
- collect milk samples and conduct mastitis testing (e.g., CMT, bacterial culture)*[GROUP]
- perform common biochemical tests*[GROUP]
- perform staining procedures*
- culture and identify common dermatophytes*

**Perform cytologic evaluation**

- assist in collecting, preparing and evaluating transudate, exudate and cytologic specimens (joint, cerebrospinal, airway, body cavity)
- perform fine needle tissue aspirates and impression smear preparation (differentiate benign vs. malignant)
- prepare and stain bone marrow specimens
- collect, prepare, and evaluate ear cytology*
- collect, prepare, and evaluate canine vaginal smears*[GROUP]
- evaluate semen
understand timing and types of pregnancy testing

assist with artificial insemination

Perform necropsy procedures:

- perform a postmortem examination or dissection on non-preserved animal*[GROUP]
- collect samples, store and ship according to laboratory protocols*[GROUP]
- explain how to handle rabies suspects and samples safely*
- handle disposal of dead animals
- perform humane euthanasia procedures

Decision-making abilities:

1. Given the characteristics of the patient, the specimen submitted and the results of the analysis, the veterinary technician will be able to recognize accurate vs. erroneous results in order to provide maximum diagnostic benefit.

2. Given the laboratory specimen collected and characteristics of the patient, the veterinary technician will determine appropriate methodology and carry out analytical procedures necessary to provide accurate and precise diagnostic information.

3. Having determined the accuracy of analytical results, the veterinary technician will work with the veterinarian to determine if a need exists for additional laboratory tests that will provide useful diagnostic information.

7. IMAGING

Skill: Safely and effectively produce diagnostic radiographic and non-radiographic images.

Tasks:

Implement and observe recommended radiation safety measures*

Implement radiographic quality control measures*

Develop and properly utilize radiographic technique charts*[GROUP]

Position dogs, cats, horses, and birds for radiographic studies*

Demonstrate an understanding of the modifications of diagnostic imaging techniques as they apply to mice, rats, guinea pigs, lizards, and amphibians*

Utilize radiographic equipment to expose x-ray film (dental, stationary* and portable units*)
Process exposed films to create diagnostic radiographic images (automatic*, hand, and digital processing)

Label, file, and store film*

Complete radiographic logs, reports, files and records*

Perform radiographic contrast studies — perform one of the following*:[GROUP]
  o  GI Series
  o  Pneumocystogram
  o  Intravenous urogram
  o  Other

Perform radiographic techniques utilized in screening for canine hip dysplasia*[GROUP]

Demonstrate proper maintenance of radiographic equipment, including recognition of faulty equipment operation*

Use ultrasonography equipment

Use endoscopic equipment

Decision-making abilities:

1. Given the characteristic of the patient and the radiographic study that has been requested, the veterinary technician will properly (1) prepare radiographic and darkroom equipment, (2) measure and position animals using topographic landmarks, (3) choose an appropriate radiographic technique to minimize the need for repeat exposures (4) produce the latent image, (5) process the exposed film, (6) analyze the final radiograph for quality in order to provide maximum diagnostic benefit.

2. Given a radiograph, the veterinary technician will be able to determine if the image is of diagnostic quality. If the image is not diagnostic, the veterinary technician will be able to offer options to correct deficiencies in order to provide maximum diagnostic benefit and minimize personnel radiation exposure from unnecessary repeat exposures.

3. Given knowledge of the health risks associated with radiographic procedures and effective safety procedures, the veterinary technician will exercise professional judgement to minimize risks to personnel and patients during radiographic procedures to ensure safety.

4. Given the characteristics of the patient and the non-radiographic imaging study that has been requested, the veterinary technician will properly (1) prepare the imaging site and equipment and (2) position patients appropriately for the study being conducted.

8. LABORATORY ANIMAL PROCEDURES
Skill: Safely and effectively handle common laboratory animals used in animal research.

Tasks: Mice, rats, and rabbits

Recognize and restrain*

determine sex and understand reproduction*

Perform and/or supervise basic care procedures:

- handling*
- nutritional needs/diet*
- watering*
- feeding*
- identification*

Administer drugs or medicaments using appropriate sites and routes (all common species)*

Perform methods of injection:

- subcutaneous*
- intramuscular*
- intradermal
- intraperitoneal*
- intravenous
- retro-orbital

Collect blood samples*[GROUP]

Perform oral dosing*[GROUP]

Have working knowledge of anesthetic and recovery procedures*

Explain common disease signs*

Perform necropsy and collect specimens

Clean and medicate ears (rabbit)

Anesthetize mice, rats, and rabbits

Tasks: Non-human primates

Understand restraint of non-human primates
Demonstrate knowledge of zoonotic diseases and modes of transmission

**Decision-making abilities:** The veterinary technician will be familiar with the basic principles of animal research and understand the utilization of laboratory animals in animal research. The veterinary technician will also have a working knowledge of federal, state, and local animal welfare regulations.

**9. AVIAN, EXOTIC, SMALL MAMMALS & FISH PROCEDURES**

**Skill:** Understand the approach to providing safe and effective care for birds, reptiles, amphibians, guinea pigs, hamsters, gerbils, and ferrets.

**Tasks:**

- Recognize, understand, and perform restraint techniques of birds*, reptiles, amphibians, rabbits and ferrets
- Understand unique husbandry issues for each species and provide client education*:
  - nutritional needs/diet
  - watering
  - caging (temperature, humidity, light)
  - aquarium care
  - understand reproduction
  - basic grooming (beak, wing, and nail clipping)
  - appropriate transportation methods
- Perform physical exam of birds*, reptiles, amphibians, and ferrets
- Perform injections using appropriate sites
  - subcutaneous
  - intramuscular
  - intradermal
  - intraperitoneal
  - intravenous
- Perform oral dosing
- Administer or inject drugs using appropriate sites
- Understand appropriate sites for catheter placement
- Understand tube feeding in birds
- Perform laboratory procedures
Anesthetize avian and exotic animals

Recognize normal and abnormal behavior patterns

Explain inadvisability of keeping wildlife as pets

Collect blood samples

Decision-making abilities: Given the unique requirements of these species, the veterinary technician will safely obtain subjective and objective data that will allow evaluation of the patient. The veterinary technician will be able to: 1) identify husbandry issues, 2) discern appropriate from inappropriate nutritional support, and 3) recognize normal from abnormal behavior patterns.
DATE: April 17, 2008

TO: Dr. Cecilia Maldonado-Daniels, Educational Leadership

FROM: Office for the Protection of Research Subjects

RE: Notification of IRB Action by Dr. Paul Jones, Co-Chair

Protocol Title: A Study to Examine Employment Utilization and Perception of Veterinary Technology Graduates
OPRS# 0802-2646

This memorandum is notification that the project referenced above has been reviewed by the UNLV Social/Behavioral Institutional Review Board (IRB) as indicated in Federal regulatory statutes 45CFR46.

The protocol has been reviewed and deemed exempt from IRB review. It is not in need of further review or approval by the IRB.

Any changes to the exempt protocol may cause this project to require a different level of IRB review. Should any changes need to be made, please submit a Modification Form.

If you have questions or require any assistance, please contact the Office for the Protection of Research Subjects at OPRSHumanSubjects@unlv.edu or call 895-2794.
APPENDIX B

FOLLOW-UP GRADUATE SURVEY 2005 AND 2006

VETERINARY TECHNOLOGY PROGRAM
GRADUATE SURVEY

Melissa A. Schalles, BS, LVT
6375 W. Charleston Blvd.
Mail Stop W1-B
Las Vegas, NV 89131
(702) 651-5875
melissa.schalles@csn.edu

1. What year did you graduate? __________

2. What is your current state of residence? (Use 2 letter abbreviation, e.g. “IN” for Indiana): __________

3. What is your age?
   _____ 21 years or younger
   _____ 22-25 years
   _____ 26-30 years
   _____ 31-35 years
   _____ 36-40 years
   _____ 41-45 years
   _____ 46 years or older

4. What is your gender? _____ Female _____ Male

5. What degree did you obtain upon graduation from the veterinary technician program?
   _____ Associate of Applied Science degree
   _____ Certificate of Achievement
   _____ Certificate of Completion

6. How many years did it take you to obtain your degree? __________

7. Are you credentialed (LVT, RVT, CVT, Other: __________)? _____ Yes _____ No
8. Are you a member of an organized technician association?  _____Yes  _____No
   If yes, check which one(s)
   _____ NAVTA  
   _____ State  
   _____ Local  

9. Have you obtained membership and qualifications in any specialty group since graduating?
   _____ Yes
   _____ No
   If yes, check which one(s)
   _____ Veterinary Technician Anesthesia Society
   _____ AALAS certification (any level)
   _____ American Society of Veterinary Dental Technicians
   _____ Association of Zoo Veterinary Technicians
   _____ Veterinary Technician Animal Behavior Society
   _____ Emergency & Critical Care Veterinary Technician Specialist

10. Indicate how well the CCSN Veterinary Technology program prepared you for your first job.
   _____ very well prepared
   _____ well prepared
   _____ somewhat prepared
   _____ poorly prepared

11. In which areas do you perceive that you were best prepared?  Mark all that apply.

   _____ pharmacy and pharmacology
   _____ surgery prep. and assisting
   _____ laboratory procedures
   _____ animal nursing
   _____ radiology and ultrasound
   _____ anesthesia
   _____ office and hospital procedures
   _____ other: ____________________________

12. In which areas do you perceive that you were least prepared?  Mark all that apply.

   _____ pharmacy and pharmacology
   _____ surgery prep. and assisting
   _____ laboratory procedures
   _____ animal nursing
   _____ radiology and ultrasound
   _____ anesthesia
   _____ office and hospital procedures
13. If you are working in a veterinary technician related occupation, check which best describes your current type of job.

____ Practice
- small animal, exclusive
- small animal, predominant
- mixed practice, equal large and small animal
- large animal, exclusive
- equine

____ Academic
- primarily teaching/clinical
- research
- Research, non-academic
- Industry/commercial organizations
- Uniformed services
- Government
- Not-for-profit organizations (humane societies, nature centers, etc.)
- Other: __________________________

Employer Name: __________________________

Employer Mailing Address: __________________________

Employer Telephone: __________________________

14. Are you currently employed?  _____ full-time  _____ part-time

15. How many total hours do you work in an average week?  ______

16. How long have you been at your current job?

- less than 6 months
- 6-12 months
- 1-2 years
- 2-3 years
- 3-4 years
- more than 4 years

17. What is your salary range?  ______
a. Less than $15,000  
| b. $15,000 - 17,999  |  
| c. $18,000 - 20,999  |  
| d. $21,000 - 23,999  |  
| e. $24,000 - 26,999  |  
| f. $27,000 - 29,999  |  
| g. $30,000 - 32,999  |  
| h. $33,000 - 35,999  |  
| i. More than $36,000  |  

18. Choose as many of the benefits you receive that apply:

____ medical/hospitalization plan  
____ paid sick leave  
____ dental plan  
____ vision plan  
____ pension/retirement/401K  
____ uniform allowance  
____ professional dues paid  
____ continuing education paid  
____ paid vacation  
____ paid maternity/paternity leave  
____ reduced or no cost veterinary services/products for your pets  
____ sales incentive plan  
____ profit sharing  
____ life insurance  
____ liability insurance  

19. If you are not working as a veterinary technician, check which best describes your present status.

____ employed in another field  
____ seeking employment  
____ not available for employment, student  
____ not available for employment, family caregiver  
____ not available for employment, disabled/illness  
____ not available for employment, other  

20. Additional comments:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

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Greetings Alumni!!

The Veterinary Technology Program at the College of Southern Nevada is updating our records. Please fill out the following information form and survey and mail back in the Self Addressed Stamped Envelope. Thank you so much for your participation. If you have any questions, please feel free to contact us.

Alumni Update Information

Name: _______________________________ Maiden Name: ____________

Address: ______________________________

____________________________________________________________________

Phone Number: ______________________

Email Address: ________________________

Employer Information:

Name: ________________________________

Address: ______________________________

____________________________________________________________________

Phone Number: ______________________

Email Address: ________________________
If you know of a classmate who might have moved, or has a new address, please write the information below:

Veterinary Technology Program Graduate Survey

1. What year did you graduate? ______

2. What is your current state of residence? (Use 2 letter abbreviation, e.g. “IN” for Indiana): ______

3. What is your age?
   ______ 21 years or younger
   ______ 22-25 years
   ______ 26-30 years
   ______ 31-35 years
   ______ 36-40 years
   ______ 41-45 years
   ______ 46 years or older

4. What is your gender? _____ Female  _____ Male

5. What degree did you obtain upon graduation from the veterinary technician program?
   ______ Associate of Applied Science degree
   ______ Certificate of Achievement

6. How many years did it take you to obtain your degree? ______

7. Are you credentialed (LVT, RVT, CVT, other)?  ____Yes  ____No

8. If you are working in a veterinary technician related occupation, check which best describes your current type of job.
   _____ Private Practice
9. How prepared were you to be a credentialed veterinary technician in the veterinary workforce upon graduating from the veterinary technology program in the following skill areas? (Please rate on a scale from 0-10: 0 being not prepared and 10 being fully prepared; Comments Recommended)

Facility Operations __________
Communication __________
Management __________
Laws and Ethics __________

*Please Comment on Facility Operations Preparedness:*

__________________________________________________________

Pharmacology and Toxicology __________
Administration __________
Dispensing __________
Documentation __________

*Please Comment on Pharmacology and Toxicology Preparedness:*

__________________________________________________________

Nursing (Small and Large Animal) __________
Patient Assessment __________
Patient Care __________
Husbandry __________
Nutrition __________
Please Comment on Nursing Preparedness:

Anesthesia
Patient Management
Equipment Management
Documentation

Please Comment on Anesthesia Preparedness:

Surgical Nursing
Patient Management
Procedure Management
Instrument Knowledge
Documentation

Please Comment on Surgical Nursing Preparedness:

Laboratory Skills
Specimen Management
Specimen Analysis
Specimen Identification
Documentation

Please Comment on Laboratory Skills Preparedness:

Imaging
Procedure Management
Documentation
Patient Management

Please Comment on Imaging Preparedness:
Please Comment on Laboratory Animal Procedures Preparedness:

Avian, Exotic, Small Mammal and Fish Procedures

Patient Management
Procedure Management
Documentation

Please Comment on Avian, Exotic, Small Mammal and Fish Procedure Preparedness:

10. How many total hours do you work in an average work week? 

11. How long have you been at your current job?

less than 6 months
6-12 months
1-2 years
2-3 years
3-4 years
more than 4 years

12. What is your salary range? 

a. Less than $15,000
b. $15,000 – 17,999
c. $18,000 – 20,999
d. $21,000 – 23,999
e. $24,000 – 26,999
f. $27,000 – 29,999
g. $30,000 – 32,999
h. $33,000 – 35,999
i. $36,000 – 38,999
j. More than $39,000
13. How well do you feel you are utilized as a credentialed veterinary technician in the veterinary workforce in the following skill areas? (Please rate on a scale from 0-10: 0 being not utilized and 10 being utilized appropriately; Comments Recommended)

| Facility Operations | ________ |
| Communication       | ________ |
| Management          | ________ |
| Laws and Ethics     | ________ |

*Please Comment on Facility Operations Utilization:*

| Pharmacology and Toxicology | ________ |
| Administration              | ________ |
| Dispensing                  | ________ |
| Documentation               | ________ |

*Please Comment on Pharmacology and Toxicology Utilization:*

| Nursing (Small and Large Animal) | ________ |
| Patient Assessment              | ________ |
| Patient Care                    | ________ |
| Husbandry                       | ________ |
| Nutrition                       | ________ |
| Therapeutics                    | ________ |
| Dentistry                       | ________ |
| Record Keeping                  | ________ |

*Please Comment on Nursing Utilization:*

| Anesthesia | ________ |
| Patient Management | ________ |
| Equipment Management | ________ |
| Documentation | ________ |

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Please Comment on Laboratory Animal Procedures Utilization:

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VITA

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   Medal of Merit awarded by the Governor of the State of Nevada
       September, 2007
   Blackhorse Award presented by the 1-221 Cavalry
       September, 2007

   Thesis Title: Veterinary Technology Graduates’ Perception of Preparedness and
       Utilization in the Workforce

   Thesis Examination Committee:
       Chairperson, Dr. Cecilia Maldonado-Daniels, Ph.D.
       Committee Member, Dr. Sterling Saddler, Ph.D.
       Committee Member, Dr. Clifford McClain, Ph.D.
       Graduate Faculty Representative, Dr. Paul Jones, Ph.D.