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What You Need to Know to Apply to Veterinary School and Career Options Available After Obtaining Your Doctorate in Veterinary Medicine

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What You Need to Know to Apply to Veterinary School and Career Options Available After
Obtaining Your Doctorate in Veterinary Medicine

A Senior Honors Thesis

Presented in Partial Fulfillment of the Requirements
for graduation in the College Honors Program

By
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May 2010

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students a model example of an Honors senior thesis project.*

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Introduction

I am a senior undergraduate student at the College at Brockport. I will be attending Cornell University of Veterinary Medicine this coming academic year. I am writing this manuscript for my thesis project which is a requirement to graduate from the Honor's Program at the College at Brockport. For my project, I wanted to do something that would increase my knowledge on a subject that was important to me: becoming a veterinarian. Also, as an undergraduate it is hard to decide what you want to do with the rest of your life, and my hope is that this manuscript can give students interested in becoming a veterinarian a better idea of exactly what it is they want to do or if they even want to become a veterinarian at all.

No one sits you down and tells you what you are getting into when you choose a course of study that interests you; it is expected that you figure out exactly what you need to do to either obtain the job you want or complete the requirements needed to go on to graduate or professional school. It is difficult figuring everything out, and sometimes mistakes are made along the way. Once someone figures everything out that is needed to complete a course of study, I believe it is in their best interest to share that information with others so they can avoid making similar mistakes.

Applying for vet school and figuring out the timing of everything that I needed to have done to apply was on my shoulders: it was my future and I had to take charge. Now that I have almost completed my undergraduate degree and have been accepted to vet school, I want to share my knowledge and experience in the hopes that other undergraduate students may learn something from the path that I took to get there. The way I did things is not the only way, but I hope that my experience and mistakes can be applied to the lives of other undergraduates so that they will have a more successful future.

What You Need to Know to Apply to Veterinary School

Veterinarians diagnose animal health issues, vaccinate against diseases, prescribe and administer medication to animals suffering from illness and infection, treat and dress wounds, interpret radiographs and blood work, set fractures, perform surgery, and give advice to owners regarding animal feeding, behavior, and breeding (4).

Knowing that you want to become a veterinarian is the start of a lifelong journey of learning and helping animals that you are passionate about. There are only 28 veterinary colleges in the United States that offer DVM programs (1). Entrance to Veterinary School is very competitive and only about 2500 students are accepted into veterinary schools in the U.S. every year. Applying to vet school is a long process that should be started in your junior year. I used Cornell's admissions requirements as a guide for preparing because they are the top-ranked vet school in the country (1).

Most veterinary schools require a minimum of 90 semester credits at an undergraduate institution with a reputation for academic excellence (2). Prerequisite courses include six semester credits of English composition, six semester credits of biology with a full year laboratory, six semester credits of inorganic chemistry with a full year laboratory, six semester credits of organic chemistry with a full year laboratory, four semester credits of biochemistry, six semester credits of physics with a full year laboratory, and three semester credits of microbiology with a laboratory (2). Some veterinary schools in the south require animal nutrition and comparative anatomy, so checking with the school that you are interested in applying to when you start your undergraduate career is the best way to be prepared and to fulfill all prerequisite requirements.

Your overall GPA and GRE tests scores are important for admission to veterinary school. To be accepted to vet school, your GPA should be fairly high, at least a 3.5 or above. GRE test scores, the combined score of the verbal and quantitative sections, accepted by vet schools can vary, the minimum being 1000 and above, but the higher your combined score the better (2).

The quality of your academic program is important as well. Factors considered for this criterion of admission are enrolling in a challenging curriculum, carrying a full course load to completion, exceeding minimum course requirements, and taking more challenging than required courses (2). Performing undergraduate research is not required, but is encouraged and looked highly upon.

Experience working with animals is required, usually with a minimum of 400 hours is required; but again, more is better, especially in this area for admission (2). Vet schools want to see that you have adequate experience working with a variety of animals in a variety of settings so you are knowledgeable in the field of veterinary medicine (2). The more experience you have, the more qualified of an applicant you are. Your experience is evaluated based on your description of your experiences in your personal statement and on the letters of recommendation from the veterinarians you directly worked with (2). Other achievements outside of academics and animal-oriented activities are important as well such as research experience, community involvement, volunteering (2).

You apply to vet school through an online application called VMCAS (Veterinary Medical Colleges' Application Service). All colleges in the United States use VMCAS as a part of their application process except Tuskegee, Texas A&M, and Tufts (3). Through this application, you submit your personal statement and your academic and animal/veterinary/biomedical research letters of recommendation (3-5 letters is ideal) (3). Your personal statement is your testament to why you should be accepted to vet school; you should briefly describe your educational background, the knowledge you have acquired through your animal/veterinary experiences, and your academic/personal strengths. In addition to the VMCAS application, most schools have you submit a hardcopy supplemental application that asks similar information directly to the school (2).

The VMCAS application opens online for students to apply in the beginning of June every year and is due in the beginning of October (3). Most supplemental applications are due in the beginning of October as well, but all of that information can be found on the VMCAS application website (3).

Along with the VMCAS and supplemental applications, you have to send your official college transcripts from all the undergraduate institutions you have attended directly to the school(s) you are applying to (2). You usually have to fill out residency documentation, a form from the dean of your undergraduate institution saying that you are in good academic standing, and AP scores and/or prerequisite substitution request forms if applicable. You should have all of these forms and your application(s) submitted before you start your senior year. This gives you a better chance to be accepted and avoids a lot of stress of doing everything at the last minute. You can view and therefore start your VMCAS application before it opens for students in June, just not officially on the website. You should also start writing your personal statement before the VMCAS application opens, even a year before your application is due if you can; have as many people as possible read your personal statement and take everyone's advice to make it the best that it can be! I hope this information helps and is in no way everything that you need to know, just a basic overview. This process is long, stressful, and hard work, but if you believe in yourself you can achieve your goal of becoming a veterinarian!

Private/Specialty Practice

About 80% of veterinarians in 2008 were employed in a solo or group private/specialty practice according to the American Veterinary Medical Association (4). Working in a private/specialty practice is the most popular and commonplace veterinarian career. Veterinarians that work in private or specialty practices care for small animals exclusively (dogs and cats), small and exotic (birds, reptiles, ferrets, hamsters, etc.) animals, mixed (small and large animals), large animals (pigs, cows, horses, goats, sheep, etc.), and equine (horses only) (4).

According to the American Veterinary Association, 77% of veterinarians that work in a private/specialty practice are either small animal or small and exotic animal veterinarians (4). About 16% of veterinarians in private/specialty practice are mixed animal or large animal veterinarians and 6% are equine veterinarians (4). Private practice veterinarians test patients for and vaccinate against diseases. Their main focus is to maintain a patient's health and quality of life; this includes euthanizing animals when necessary.

Small, exotic, and some mixed animal veterinarians have offices where clients and patients go to be seen and treated whereas large animal and equine veterinarians drive to farms and ranches to examine and treat either individual animals or herds of animals (4). Large and equine veterinarians have to treat and dress wounds, set fractures, and perform surgery (including cesarean sections and birthing animals) on location; they have to be prepared for any type of medical emergency and have all the necessary supplies with them when they travel to see their patients (4).

Small, exotic, and mixed animal veterinarians work long hours in noisy indoor environments. They have to deal with emotional and demanding pet owners and frightened, painful, angry/mean animals which puts them at risk of being scratched, kicked, or bitten (4). Large animal and equine veterinarians spend a lot of time driving between their office and their client's home which can be tiresome especially if the client lives far away or if there is bad

weather. These veterinarians have to work outdoors in all weather and possibly in unsanitary conditions (4).

Veterinarians working in specialty practices can either provide emergency services (i.e. a hospital for animals) or be a specialist. There are many fields that veterinarians can specialize in which requires additional schooling in the form of a residency which lasts two to three years depending on the specialty (2). Residencies are offered at veterinary schools and some large specialty hospitals (2). Completing a residency and demonstrating proficiency and expertise on a board examination is required in order to be certified by a veterinary medical specialty board (2). The main specialty fields include: anesthesia, behavior, cardiology, dentistry, dermatology, emergency/critical care, internal medicine, neurology, nutrition, oncology, ophthalmology, radiation oncology, radiology, shelter medicine, surgery, and theriogenology (2). As of December 2010, there were 10,210 board certified veterinary specialists in the United States (12).

All veterinarians work long hours, and vets that work in group practices may take turns being on call during evening or weekend hours. Group and solo practices also may have certain nights with extended hours or extended weekend hours to accommodate clients and emergency situations (4).

Most veterinarians become involved in private/specialty practices by joining an established group practice. Some veterinarians may remain working in a group practice for the rest of the career; or after gaining enough experience working in a group practice, if they desire to start their own business they can or they can purchase an established business (4).

Employment for veterinarians is expected to increase much faster than average: a 33% increase is expected between 2008 and 2018 (4). As a result of having only 28 accredited veterinary schools in the United States, only around 2500 vet students are graduating each year which means less competition for jobs (4). Most graduates are attracted to working with small animals, so job opportunities in cities and suburbs are very good because that is where most pet owners live. Job opportunities in rural areas are even greater because there is much less competition due to less interest in large animal and equine medicine (4).

Recent trends indicate that more people have pets, especially cats, and they want to ensure they are cared for. Faster growth of the cat population as a result of these animals being a desired pet will increase the demand for feline veterinary care and services (4). Veterinary care for dogs will remain at a steady increase for the time being (4).

Many pet owners consider their pets to be a part of their family, supporting the fact that humans are placing a higher value on pets. These pet owners are becoming more aware of advance care for their animals and are more willing to pay for more intensive, expensive, and nontraditional care (such as cancer treatment and preventative dental care) than animal owners in the past (4). Veterinary medicine has caught up with human medicine: kidney transplants, hip replacements, and blood transfusions are now available for animals. In addition, more pet owners are purchasing pet insurance which means that these owners are likely to spend a considerable amount of money on veterinary care (4).

Most first year veterinarian graduates start out making between \$27,000-30,999 (6). As of May 2008, the average annual salary for veterinarians was \$79,050 (4). Starting salaries for veterinary graduates differ based on what field of private/specialty practice they enter into. The mean first-year salary in 2010 for small animal/companion animal veterinarians was \$71,462, large animal/food animal veterinarians was \$68,933, mixed animal veterinarians was \$62,327, and equine veterinarians was \$38,468 (6). In addition, as of December 2010, the median income for large animal/food production veterinarians was \$103,000, mixed animal veterinarians was \$85,000, small animal/companion animal veterinarians was \$97,000, and equine veterinarians was \$85,000 (7).

Biomedical Research

Veterinarians in research “seek better ways to prevent, diagnose, and treat animal and human health problems” (8). These veterinarians perform pharmaceutical or biomedical research where they develop, test, and supervise the production of drugs, chemicals, and biological products (antibiotics and vaccines for use by humans and animals) (8). Veterinarians that work with animals in a research environment may work for a company or for the United States government. The main areas of basic and applied research that veterinarians work in are “the human-animal bond, food safety, emerging diseases and zoonoses, bioterrorism or agro-terrorism with select agents, animal and human health and safety, and ecosystem and wildlife health” (9).

In both a corporate or government setting, these veterinarians provide medical care to the animals involved in research on a daily basis; they guarantee that the research animals are properly and humanly cared for and that their health and welfare is protected (8). There are standards that veterinarians ensure are upheld for the treatment of animals in laboratories that are set and checked by the United States Department of Agriculture (USDA) (8). Veterinarians working in this field use their knowledge and experience to improve surgical techniques for both humans and animals (8). Research veterinarians can also work for the government which will be discussed in a later section.

It is a veterinarian’s responsibility to guarantee that every animal study performed satisfies the criteria established by the Institutional Animal Care and Use Committee (IACUC) which determines if the study is necessary, that the animals used do not suffer unnecessarily, and that the number and type of animals used is appropriate (8). The most challenging part of a research veterinarian’s job is “the vast amount of knowledge they must have readily available”; they must understand entire processes and the physiology behind them such as everything about a disease from its causes to the way it interacts with cells of the body in order to research potential cures (8).

Research veterinarians, in addition to their DVM degree, obtain a doctorate or master's degree in pharmacology, virology, bacteriology, pathology, parasitology, toxicology, nutrition, or endocrinology (8). At certain veterinary schools in the U.S., vet students working towards their DVM degree can also simultaneously earn their PhD in one of these fields (2).

The future prospect for employment for research veterinarians is excellent. The number of research veterinarians in the U.S. is already inadequate to meet the needs of biomedical research and public health (9). Research areas with the greatest need for veterinarians include "translational medical research, veterinary pathology, laboratory-animal medicine, emerging infectious diseases, public health, academic medicine, and production-animal medicine" (9). There is an increased emphasis on the "scientific methods of breeding and raising livestock, poultry, and fish" which is contributing to the increased demand for veterinary researchers as well (8).

Research veterinarians also continue to support public health and disease control programs and develop new surgical and medical treatments for animals that can be used for both animals and humans (8). Corporations and the government are keen to hire research veterinarians because "animal research is often a necessary link to connect basic research with human clinical research" (9). Animal research can lay the foundation for improved human health care. Research veterinarians working for the government (public) or a corporation generally earn more than private practice veterinarians averaging between \$110,000-170,000 a year (7,10).

Zoo Work

Veterinarians working with wildlife in a zoo setting provide medical care for thousands of species; most of these species are treated by no other kind of veterinarian. Zoo veterinarians mostly “diagnose and treat illnesses and injuries, perform surgery, and prescribe medicine and rehabilitation regimens” (11). One of the most critical tasks of a zoo veterinarian is responding to emergencies; traumatic injuries can occur when “animals fall, bang into things, or spar with each other” (11).

Wild animals are harder to treat in general because a veterinarian cannot thoroughly examine an animal unless it is under anesthesia. Diagnosing problems with wild animals is also hard because their instinct is to hide their weakness for as long as possible because in the wild an animal that looks vulnerable will become prey (11). When examining wild animals, it is also hard to know what is “normal” for a particular animal/species because of the variety of species you could be caring for. Treating wild animals requires creativity because it is not unusual to run into a problem that has never been encountered before (11). Zoo veterinarians have to be good problem solvers and have the flexibility to adjust to each animal’s behavior in order to administer treatment (11).

Working with wild and potentially dangerous animals requires a veterinarian and their team to have good communication skills and to carefully follow safety precautions (11). When zoo veterinarians are not treating or caring for patients, they are working with curators to design and develop animal diets (11).

In order to become a zoo or aquarium veterinarian, after obtaining your DVM degree, an additional internship or residency of up to three years is required (11). To work as a zoo veterinarian, certification by The American College of Zoological Medicine is required which is granted after your residency is completed and you pass the College of Zoological Medicine board exam (11). Becoming a zoo veterinarian is hard to do, but not impossible. Zoological medicine internships are very competitive because there are only a small number of internships

available at zoos across the country. In order to secure one of these internships, having experience working or volunteering at a zoo or with wild animals is a must.

Zoological medicine is one of the smallest veterinary specialties (11). As of 2010, the United States only employed 126 zoo veterinarians (12). However, there has been an increased concern for animal health, and zoos and aquariums historically have been hiring more veterinarians (11). Large zoos usually have three or more veterinarians, medium-sized zoos usually have one veterinarian, and small zoos often contract with a local veterinarian as needed instead of hiring a full-time veterinarian (11). The average salary for a zoo veterinarian as of 2011 is \$46,000 (13). As they say, zoo veterinarians do not enter this field for the money.

Wildlife/Field Research

Veterinarians that conduct research that is not in a laboratory are considered field research veterinarians. The goal of this line of work is to maintain ecosystem health (15). There are two basic divisions among field research veterinarians: problem solving and directed field studies (14).

Veterinarians involved in the problem solving portion of field research respond to requests from producers of livestock and poultry, veterinarians, county agents, and other agricultural resources. These veterinarians provide problem-solving assistance and when necessary visits to the sites of these animals (14). Field investigations explored by veterinarians generally involve health problems such as “diseases with the potential for serious animal or human health consequences, serious herd health problems for which local resources are inadequate or unable to establish a diagnosis and/or to effect control, and diseases or conditions identified as important focus areas for investigation and/or applied research” (14).

Veterinarians make a plan, put someone in charge of monitoring the progress of the problem, and follow-up until a satisfactory plan of action has been reached (14). If a formal investigation was conducted, the veterinarian is in charge of writing a report consisting of the plan of action and results to all parties involved (14).

Diseases in animals can be caused by pathogens, pollutants, genetics, or dietary deficiencies, and can threaten wildlife populations (15). Wildlife diseases can also affect “humans, livestock, and the economy” (15). In order to protect wildlife and humans, the job of a veterinarian is to trace the origin of the disease, and how it develops, spreads, and can be stopped (15).

Wildlife Veterinarians usually work for organizations such as the Wildlife Conservation Society or the Wildlife Disease Association (15). Current studies by wildlife veterinarians for the WCS are focused on the West Nile Virus, Bird Flu, and Ebola Hemorrhagic Fever Virus (15).

Field studies are directed by veterinarians in order to study certain diseases or conditions or to seek new information about wildlife of interest (14). As the number of people

in our world increases, we are expanding into the natural habitats of wildlife that are being negatively impacted (15). Infectious and non-infectious diseases of humans, domestic animals, and wildlife are becoming more challenging for veterinarians to study and it is effecting the improvement of the quality of life for humans (15). Wildlife veterinarians work with in-country wildlife experts, government agencies, and public health officials to create local training programs, conduct health investigations, inform policy decisions, and create “preventative guidelines to reduce disease transmission between wildlife, humans, and domestic animals” (15).

Wildlife veterinarians are also enthusiastic to share their knowledge and expertise with the next generation of wildlife veterinarians and conservationists in order to continue their work of saving wildlife and their natural environments (15).

Current studies by wildlife veterinarians for the WCS are being conducted in Africa on Great Apes, the Adirondacks on loons, and Patagonia on penguins and other seabirds (15). The results of their studies are generally published in farm and professional journals as well as in presentations they give (14).

In order to become a wildlife veterinarian, you need to earn your DVM degree with an emphasis on wildlife health. A master’s or doctorate in zoology, wildlife management, anthropology, or a similar field is required for most positions (16). Experience with wildlife through an internship, working, or volunteering at a zoo, aquarium, national park, wildlife refuge, management facility, or animal shelter is also required to become a wildlife veterinarian (16). Wildlife/field research veterinarian’s salaries are different based on who their employer is, but the average salary as of 2011 was \$51,000 (17).

Public Service/Government Work

Veterinarians working in public service are typically employed by the U.S. Department of Agriculture (18). However, others are employed by the Centers for Disease Control (CDC), the Food and Drug Administration (FDA) Division of Veterinary Medicine, the National Institutes of Health (NIH), U.S. Fish and Wildlife Service, Environmental Protection Agency, armed services, and other agencies that use laboratory animals (18). There are three branches of the U.S. Department of Agriculture that require the employment of veterinarians: the Agricultural Research Service (ARS), the Animal and Plant Health Inspection Service (APHIS), and the Food and Safety Inspection Service (FSIS) (18).

The ARS “administers a national program of fundamental and applied research on diseases and parasites that affect animals, poultry, and furbearing mammals” (18). This branch of the U.S. Department of Agriculture is responsible for developing improved vaccines, diagnostic agents, and other methods to control and suppress diseases (18). The diseases that receive the most attention are infectious diseases, nutritional diseases, and poisonings (18). Veterinarians work in cooperation with other scientists to produce solutions to regional, national, or international problems (18). These results may also have a direct effect on human health and welfare.

APHIS veterinarians help protect the “health and marketability of America’s animals” (18). They deal with local, regional, national, and international animal health problems (18). These veterinarians also directly provide support and advice about disease control and prevention to livestock and poultry producers (18). Other responsibilities they have include controlling and suppressing outbreaks of diseases among animals and poultry, protecting U.S. livestock and poultry from foreign diseases by inspecting and quarantining foreign animals at air and sea points of entry, controlling and suppressing foreign diseases that may have escaped U.S. border defenses, certifying that animals and animal products for export are disease-free, controlling biological materials prepared for use by animals, and enforcement of the Horse Protection Act and the Animal Welfare Act (18).

The FSIS is responsible for inspecting food products and ensuring that they are sanitarly handled and are labeled accurately in order to protect American consumers (18). Meat and meat products processed in the U.S. for interstate and foreign shipment must be federally inspected by a veterinarian (18). Also, about 80% of animals annually slaughtered are inspected by a veterinarian; the rest are inspected by state or municipal control (18). 1,400 veterinarians are employed by the government for the inspection of more than the 130 million meat animals and 3 billion birds that are slaughtered annually at the 6,000 processing plants in the U.S. (18). FSIS veterinarians are also responsible for inspecting and certifying the more than 1,000 processing plants in foreign countries that ship meat products to the U.S. (18). The FSIS branch of the U.S. Department of Agriculture employs the most veterinarians by the government (18).

In order to work for the government as a veterinarian, only a DVM is required. However, most veterinarians have master's or doctorate degrees in veterinary public health or a particular specialty like pathology or parasitology (18). Having practical experience in disease control and suppression is also beneficial to work in this field (18). As of December 2010, 1,780 veterinarians were employed by the Federal Government earning an average salary of \$103,000 and 1,099 veterinarians were employed by state and local governments earning an average salary of \$106,000 (7). Starting salaries for this field can range from \$34,575-50,139 depending on what department of the government you work for (18).

Military

Throughout the nineteenth century, veterinarians were employed by the army to care for military animals and to inspect the meat, poultry, and dairy products used by the military (18). In 1916, the U.S. Army Veterinary Corps was established by Congress and they mainly cared for cavalry horses (18). Since the establishment of the Army Veterinary Corps, military veterinarians have worked to maintain the health of animals and soldiers at home and overseas (18). In the last 50 years, many military veterinarians have also been certified in a specialty and are involved in research pertaining to the treatment of animal and human injuries and illnesses (18).

Today, military veterinarians have three main responsibilities: public health and food safety for troops, care for military working dogs, and to provide health care for pets belonging to members and retired members of the military and their families (19). Along with being responsible for the health of military working dogs, military veterinarians also care for the 5,000 horses in the cavalry unit in Texas and for the horses used at Arlington National Cemetery for the changing of the guard (18). Veterinarians in the army are also called upon during humanitarian relief efforts to help evacuate pets from hurricane, flood, and earthquake disasters (18).

Today, military veterinarians also assist in programs “designed to protect the health of military and civilian personnel” (18). They focus on disease prevention with work on sanitation, handling food and water supplies, waste disposal, insect and rodent control, and other health management concerns (18). Veterinary services in military establishments help control and prevent livestock and pet diseases; as a result, this protects military and civilian populations from diseases that are transmissible to humans such as rabies and tuberculosis (18).

Veterinarians can be employed by the U.S. in military bases all over the world, so they also work with local public health officials and livestock agencies to raise animal production standards and to improve processing and distribution of food products (18). They are involved with the prevention of prevalent transmissible diseases at these bases (18). Military

veterinarians are currently working through biomedical research to create vaccines, antitoxins, and antidotes that will protect soldiers and civilians (18).

About 35% of U.S. army veterinarians work for the United States Army Veterinary Command (VETCOM) which provides military veterinary services to the United States Army Medical Command (MEDCOM). These veterinarians provide animal medicine; implement technology-based food safety programs; assess food bioterrorism threats; and provide support to the Navy, Marines, and Air Force (18).

91T, which is an animal care specialist position, is another career in the military that veterinarians can pursue (18). These veterinarians are trained by the Department of Veterinary Science of the U.S. Army Veterinary Medicine School. Their main responsibilities include caring for the health and maintenance of the working military dogs and working at military research facilities to oversee the humane care and treatment of research animals (18). 91T veterinarians also have an opportunity to work with animals other than dogs and horses such as dolphins trained by the Navy (18).

There is no extra training required to be a military veterinarian unless you want to get involved with military research. About 25% of Army veterinarians are involved in research and have a master's or doctorate in a specialty such as pathology, toxicology, lab animal medicine, or microbiology (19). Army veterinarians that are not directly involved with research may be specialists in public health or in a clinical specialty such as surgery, medicine, or radiology (19).

The salary of a military veterinarian is determined by the number of years of service and their rank (20). The starting salary for a captain is \$65,115 and for a major is \$73,811 (20). After eight years of service, a captain can earn \$83,752 annually and a major can earn \$92,060 annually (20). The army also boasts other benefits such as full medical/dental coverage, low-cost life insurance, paid continuing education, and post-DVM educational opportunities and board certification (20).

Teaching

Many academic and personnel veterinarians are employed by U.S. veterinary colleges (18). Most of these teachers hold veterinary degrees and a small majority have earned their doctorate alone or in combination with a DVM degree (18). Veterinarians that have a master's or doctorate degree in addition to their DVM degree are in higher demand for the academic field (21). There are many teaching opportunities because there are twenty-eight veterinary schools in the United States (21).

Veterinarians that become teachers use their experience to teach current veterinary students about the profession (21). Some veterinarians work full-time at a college, university, or veterinary medical school, or some continue working as a veterinarian and teach part-time (21). A number of veterinarians that have been practicing veterinary medicine for years enter the teaching field because teaching schedules are much easier and they want to share their knowledge and love of veterinary medicine with students (21).

If you do not have a master's or doctorate degree when you are hired, that usually becomes a part of your employment agreement (18). These veterinarians are expected to teach and to complete their schooling for their graduate degree at the same time within one or two years after being hired (18). When you are hired, if you already have a master's or doctorate degree you can expect a higher starting salary and rank (18). To attain a top position in teaching, veterinarians must have their doctorate degree (18). Academic veterinarians used to earn less than the field's average, but as of December 2010, 6,425 veterinarians were employed by colleges and universities with a median salary of \$103,000 (7). The starting salary for a teacher can be upwards of \$65,000 depending on your educational background (21).

In addition to making a good salary, more veterinarians are turning to teaching for other professional reasons as well. Working in an academic environment is stimulating and rewarding for individuals seeking intellectual and professional growth (18). Teachers are an important part of their students' lives: they are molding future veterinarians to be able to handle the responsibilities of their profession (18). Academic work is also rewarding because a

“university community provides an excellent environment for the life and education” of the families of veterinarians (18).

Teachers are given the best opportunities to make considerable contributions to their field (18). Veterinary schools boast some of the best laboratories and research facilities if research is something that you are interested in as well (18). Teachers that do research can also contribute knowledge that may “influence the future of veterinary and medical science” (18).

Industry

Veterinarians employed in industry have a variety of responsibilities ranging from overseeing the health of food production animals to researching new drugs for pharmaceutical companies (18). Veterinarians in industrial settings do not necessarily care for animals and are often involved at a managerial level (18).

Human and veterinary pharmaceutical companies have come to realize the common use for many drugs, and since that time industry veterinary employment has grown (18). Most large pharmaceutical companies that produce human medicine also have veterinary divisions which are important for research, production, and sales of new drugs and treatments (18).

Most veterinarians in industry work for drug companies as a member of teams in “the development and marketing of pharmaceuticals, antibiotics, and biologicals for the treatment, prevention, and diagnosis of disease” (18). Veterinarians are responsible for quality control and testing the therapeutic, preventative, and diagnostic effectiveness of new drugs (18). They are also required to test the toxicity of new drugs and their effect on the tissues of the laboratory animals in which they were tested (18).

The techniques in the development and testing of drugs require veterinarians that are trained in pathology, pharmacology, and toxicology (18). Veterinarians that have these specialties are in constant demand for industry positions with excellent salaries (18).

Another division of industry where veterinarians work is the food industry. Most veterinarians working in this division are employed by the commercial feed industry that mainly hires veterinarians with specialties in biochemistry and nutrition and their application to the management of livestock (18). Special feeds for animals and pets, which are supplemented with vitamins, minerals, and antibiotics, are prepared and tested by veterinarians (18).

Other opportunities for veterinarians in industry include technical field service, public relations, and sales (18). These veterinarians are important for keeping industry informed of “changes occurring in livestock production and in veterinary practice that may affect research, production, and sales policies” (18). Additionally, veterinarians in this field assist practicing

veterinarians and livestock owners with special problems (18). Veterinarians are also directors of diagnostic laboratories which are established and supported by industries in order to provide technical service to customers (18).

According to the AVMA, in 1999 there were 1,570 industry veterinarians employed in the United States and as of 2010 there were 3,218 employed industry veterinarians (7,18). Mostly men are employed in this field, but as it continues to grow hopefully more women will become involved as well. In 1999, industry veterinarians earned an average salary of \$109,941 (18). Today, working in industry is still one of the most lucrative fields with veterinarians earning a median salary of \$148,000 (7).

Epilogue

As you can see becoming a veterinarian takes a lot of planning and determination. Not only do you have to be intelligent, achieve a high GPA and excellent test scores, but you have to be dedicated and driven to your future. Starting early is the key for success: plan ahead. It is never too early to start planning for the future you desire. My biggest piece of advice to anyone pursuing a career in veterinary medicine is to believe in yourself because if you don't why should anyone else? It's not the praise from others that encourages and guides you along the way; all you need is to know that you can achieve your dreams, no matter what it takes.

This manuscript is in no way a list of all the careers you can pursue in veterinary medicine. Some of the other careers that I did not write about include: nonprofit work, rehabilitating wildlife, conservation of endangered species, controlling disease outbreaks in the United States and worldwide, lobby congress on behalf of the AVMA or other associations, work for health agencies as bioterrorism experts, work at an aquarium, be an executive for pet-food companies, manage food production animals on large farms, and developing educational materials for the government to distribute to people throughout the world, etc (2). Veterinarians are involved in many aspects of government, industry, education, research, and the lives of their owners in more ways than I ever imagined.

This manuscript was an attempt for you the reader, hopefully a pre-veterinary student, to gain a bigger picture at some of the most popular careers in veterinary medicine. I hope this guide helped you learn something, and if not, maybe it showed you a place where you can find and learn more about your interests in veterinary medicine.

Writing this manuscript educated me on what I potentially want to do with my degree and also gave me a whole new respect for the work that veterinarians do. Learning all the fields of work that veterinarians are involved in renewed my excitement in this career and it reminded me of my passion for the future I have chosen.

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I have always possessed the knowledge that I would become a veterinarian; it is my life's passion. The issue of contention for me was, and I would assume for others in my situation, what career paths were available or even viable when graduating from this rigorous course. This conflict precipitated my decision to author a manuscript for my thesis project that described the different careers you can pursue as a veterinarian. The goal of my project was to help other pre-veterinary students decide what careers they wanted to practice or if they even wanted to become a veterinarian at all. My project will hopefully be useful to Brockport pre-veterinary students that have not researched the different career options they have after becoming a veterinarian or that they may be interested in a different job than they originally thought they were. This project has also helped me to further investigate what I want to do once I obtain my degree in veterinary medicine.

When you choose a career you want to pursue as an undergraduate student, no one sits you down and explains everything you need to do in order to fulfill your dream. Your teachers, advisor, and classmates give you guidance, but you essentially need to figure out all the details and the timing yourself. They do care about you, but it's your future and you need to take charge of it.

I wish that I would have had guidance from an upperclassman that was following the same plan I had through my undergraduate degree. However, that would have been difficult to find because not many students followed a plan similar to mine and additionally not many individuals are accepted to veterinary school. I went to a community college prior to Brockport, so I had to do more planning than most other students that attended a four year university for

the entirety of their undergraduate degree. I would have been grateful to have a reference that contained advice and some information about careers I was interested in. I hope that many of the pre-veterinary students that attend Brockport will read the manuscript I created, and if just one student finds it useful then I will be satisfied with my accomplishment.

The manuscript I wrote was limited to eight different careers that are the most published and popular according to the United States government website. The careers I included in my manual were: working as a veterinarian in a private primary care or specialty practice, working in a laboratory performing biomedical research, working as a veterinarian in the military, working for the government and public service work, working at a zoo with wild animals, becoming an educator of veterinary medicine, conducting field research as a wildlife veterinarian, and working as a veterinarian in industry.

In the beginning of my manuscript, I discuss admission information, the process of applying to veterinary school, and what the prospects are for veterinarians in the near future. For each career, I discuss how to become involved in that line of work (do you need any extra training, etc), what the job responsibilities are, and what the expected starting or average salary is.

My original plan when I started researching was to use books/literature specifically about each of these careers, however, there are not many books solely dedicated to one type of veterinary career. Nevertheless, I did find a helpful book that contained information about many careers in veterinary medicine. I used government and the American Veterinary Medical Association (AVMA) websites in order to find factual and relevant information about the careers I chose to write about. I also checked the information I found on more than one site to ensure that it was accurate. I found a substantial amount of information that I included in my manuscript on Cornell University's Veterinary Medicine webpage. Since the veterinary school at Cornell is rated number one in the nation, I decided that using

information from their website would be useful for gathering the most inclusive and rigorous admission information.

This thesis project has been one of the most rewarding experiences that I have accomplished during my academic career. I have enjoyed the opportunity for learning that it has brought me and I truly hope that someone else can benefit from the research, learning, and writing process that I underwent to create this project.