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Career Opportunities in Veterinary Medicine

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UNIVERSITY HONORS PROGRAM

SENIOR PROJECT - APPROVAL

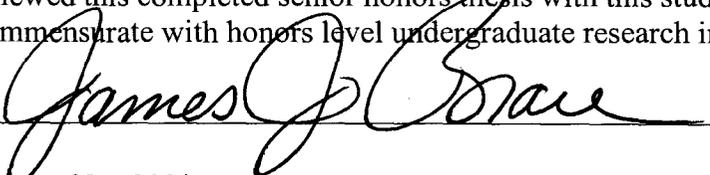
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PROJECT TITLE: Career Opportunities in Veterinary Medicine

I have reviewed this completed senior honors thesis with this student and certify that it is a project commensurate with honors level undergraduate research in this field.

Signed: , Faculty Mentor

Date: May 03, 2004

Comments (Optional):

Careers in Veterinary Medicine

According to the AVMA, there are approximately 60,000 veterinarians in the United States. It is reported that 100% of graduating veterinary students enter veterinary-related careers after receiving a Doctor of Veterinary Medicine degree. Most veterinarians are employed within a private practice but there are numerous fields veterinarians may be employed. These include the military, government, pharmaceutical industry, food safety, teaching and research, and public health. The possibilities for the graduating veterinary student are endless and expand beyond these fields. Some careers may also engulf several areas at once. For example, a job in the government may involve research aimed at preventing human disease, which would be public health. This compilation is a starting point for employment information of the various careers in veterinary medicine for the veterinary student.

Careers in Veterinary Medicine

- I. Military
- II. Government
- III. Pharmaceutical
- IV. Food Safety
- V. Teaching and Research
- VI. Public Health
- VII. Private Practice

I. Military

According to AVMA, approximately 460 veterinarians were employed in the military as of August 2001. Veterinarians serve the military in three general areas: Clinical practice, food safety, and research. In clinical medicine, military veterinarians provide medical treatment to serving military animals that are owned by the government. The majority of these animals are dogs. Dogs are used to detect mines and drugs. Government animals cared for by military veterinarians include those used in any ceremonies such as horses, and laboratory animals used in research as well. Military veterinarians also provide medical care to animals owned by military members overseas. Providing food safety is another important role of the serving veterinarian. Veterinarians ensure the food that the military members and their families consume is safe and free of any food-borne illnesses. They usually focus on sanitation, and finding reliable and safe sources of food products within the locale. In the research sector, veterinarians investigate toxic chemicals and infectious risks to protect military employees. A major military agency involved in all three areas of military veterinary medicine is the Army Veterinary Corps.

The U.S. Army Veterinary Corps provides services such as food safety, biomedical research, and clinical medicine to all areas of the Department of Defense—Marine Corps, Navy, Army, and Air Force. Approximately 400 veterinarians are serving in the Army Veterinary Corps to date. The requirements for eligibility are:

1. U.S. Citizen

2. Graduate of accredited U.S. College of veterinary medicine, or certification by the Education Commission for Foreign Veterinary Graduates if foreign veterinary school graduate.
3. License to practice in a U.S. Territory, District of Columbia, Puerto Rico, or at least one state in the United States.
4. Under the age of 47 upon appointment.
5. Satisfactory medical examination and background checks.

The recruit must participate in basic training in the Officer Basic Course in Ft. Sam Houston in San Antonio, Texas. This is not the Army basic training, but offers preparation for assignments and in-depth knowledge of the Veterinary Corps. Assignments are available in every sector of the Department of Defense, within the U.S. and overseas. Assignments are based on training, experience, and the needs of the military. First assignments are usually within the continental U.S. Services provided on these assignments include clinical care, food safety inspections and programs, and supervision of other employees. Other advanced assignments include Special Forces, overseas instatement, and field units. Assignment sites are available all over the world, including Germany, Spain, Italy, Saudi Arabia, England, Japan, and Korea. Pay is competitive but based on rank and years of service. As a reference, at the rank of captain, the compensation range is from \$52,000 to \$68,000 a year. As a major, the range is \$58,000 to \$76,000 a year. For both ranks, the pay increases with years in service. This includes non-taxable allowances for housing and subsistence. Other benefits provided by the service are full dental and medical coverage for officers, with low-cost coverage for dependents, and low-cost life insurance. Retirement plans are also available through the

service. The Army Veterinary Corps strongly encourages continuing education and covers the costs in full. Continuing education opportunities include seminars and workshops to keep up-to-date with advancements in veterinary medicine. Programs are also available to obtain advanced degrees such as a Ph. D. or Master's degree in specialty areas. The Armed Forces Institute of Pathology offers a residency program available to veterinary medical officers. More information on the Army Veterinary Corps is available at <http://vets.amedd.army.mil/>

A department of specialty within the military focusing on the research and development mission is the Armed Forces Institute of Pathology. The AFIP provides three areas of service: clinical consultation, research, and education. As consultants, the AFIP provides pathology services for Department of Defense animals as well as second opinions for military and civilian pathology investigations. The major focus is placed on the 1500 military dogs owned by the Department of Defense, but the AFIP is also involved in wildlife and exotics issues. The research mission includes laboratory animal research as well as independent studies. National meetings, conferences, and seminars are available for attendance for continuing education. Select cases are presented in special Wednesday Slide Conferences. Training is offered in a three-year systemic pathology program, which involves researching and presenting cases. Currently there are 13 residents in the program. This residency program is offered only to active Army Veterinary Corps officers who have served on at least two different assignments, which equates to a minimum of about three to five years of service. A training board selects the residents by certain criteria such as a personal statement, academic accomplishment, and military profile. Residents receive the full pay and benefits of their active rank while in

the program. Residents are expected to complete the challenging training requirements, which include presenting at a regional pathology meeting. At the end of the residency, a board certification exam in veterinary anatomic pathology is administered over two days. The benefits of such an opportunity include Ph. D. opportunities and priority for staff positions within the AFIP. For more information on the residency program at AFIP, please visit <http://www.afip.org/vetpath/index.html>

The Biomedical Sciences Corp is a specialized department within the U.S. Air Force. Veterinarians within this department serve as Public Health Officers and serve similar duties as Army Veterinary Corp. A nursing degree with an MPH or DVM is the educational requirement. A twelve-week course at the School of Aerospace Medicine at Brooks AFB, Texas is also required. Some categories of duties include epidemiology, communicable disease surveillance and control, oversight of immunization, food safety, and medical surveillance. Public Health Officers are assigned to Public Health Flight for a hospital or base clinic, with the number of serving officers varying upon task of clinic. Over 80 clinics and hospitals are involved in the Air Force Medical Service (AFMS). For a starting veterinarian, the gross salary is \$4,311.40 per month plus \$1,133 per month that is non-taxable. Base pay raises begin after two years of service and occur every year after. Promotions are also awarded. Some continuing education opportunities include a Masters in Public Health (MPH), Epidemic Intelligence Service (EIS) Fellowships at the CDC, and Air War College. Tuition and fees may be paid partly by the Air Force. Insurance and retirement plans are similar to other military departments. For more information: www.afms.mil/sgcb/index.cfm

<http://hp.airforce.com>

Additional Resources:

Brennan, Rex, Colonel, PHO. Email correspondence. April 16, 2003. Subject: Public Health Officer Information.

Hale, Sarah L., DVM, Diplomate, ACVP. Email correspondence. April 8, 2003. Subject: VS Recruiting

Inskeep, Bill, Colonel. Email correspondence. April 10, 2003. Subject: Military Veterinarian Research

www.avma.org

II. Government

Approximately 14% of veterinarians are employed at a variety of levels of government—national, state, and local. Federal veterinarians can work in several federal agencies such as FDA, USDA, and FSIS. State veterinarians work on the state level to prevent the spread of disease into or out of their respected states. At any level, government veterinarians work for the same goals in public health by controlling animal disease, especially in food animals. They are also responsible for transport of animals in and out of the country, as well as between states. They perform the mandatory testing of contagious diseases required by the destination location before and after transport. For example, if a cow was to be transported between Tennessee and Kentucky, first a Tennessee government veterinarian would test the animal for any disease requested by the state of Kentucky. Once the animal has entered Kentucky, a government veterinarian of that state would quarantine and monitor the animal for further developments.

In other agencies, veterinarians develop and test new animal drugs for safety and effectiveness. These agencies usually also monitor compliance of animal drugs and regulations of sanitation.

The Federal Government employed approximately 800 civilian veterinarians in 2000. The job outlook for federal veterinarians is best for those with training in public health and epidemiology. New graduates entering employment by the Federal Government have a beginning salary of approximately \$35,000 annually. The average pay for veterinarians in the Federal Government in 2001 was approximately \$67,000 annually.

Food and Drug Administration—Center for Veterinary Medicine

The Food and Drug Administration's Center of Veterinary Medicine is known mostly as a public health organization. The CVM approves animal drugs and feed additives based on effectiveness for its intended use and safety, not only towards the animal but also to the consumer of the products the animal supplies, like meat and milk. The agency works to eradicate residues of drugs and feed additives used on food animals, so there are no adverse effects in the human population. The FDA also approves drugs used for companion animals that do not produce meat or milk for consumption. The CVM not only approves new animal drugs, but also monitors compliance. They survey compliance within the Federal Food, Drug, and Cosmetic Act and other related regulations, and process legal cases if necessary. Veterinarians constitute a portion of the 300 scientists employed by the CVM.

A veterinarian in the FDA-CVM can serve as a veterinary medical officer. Employment is restricted to U.S. citizens, but programs are available to residents of the U.S. who are not citizens. Positions are usually filed as GS-9 through GS-13 grades. The annual salary increases with grade. The higher grade levels are based on peer review and personal achievements. All positions are placed in Rockville, Maryland, except the Office of Research in Laurel, Maryland. Benefits available through the Federal Government include paid holidays, life insurance, health benefits, annual and sick leave, and retirement plans. Current federal employees, known as "status candidates," have priority over applicants that have never held a career in the federal government, called

“non-status candidates.” Veterinary medical officers can achieve promotions up to levels GS-13 and GS-14. Some salary ranges for comparison are

GS-12: \$57,000 to \$74,000 annually

GS-13: \$68,000 to \$88,000 annually

GS-14: \$80,000 to \$104,000 annually.

Job information in the FDA-CVM can be found at

www.fda.gov/cvm/vacancy/careerops.html.

Centers for Disease Control

Within the Centers for Disease Control, veterinarians mostly work as epidemiologists. As epidemiologists, they conduct research all over the world, including the United States. These veterinarians are usually Epidemic Intelligence Service officers. The CDC offers a two-year training program for these officers focusing on applied epidemiology. In addition to dealing with the medical aspects of the disease, epidemiologists are being trained to manage the social characteristics and behavioral risks of disease as well. Infectious diseases like HIV and AIDS are of major concern as well as other chronic diseases. Emphasis is also put on preventive measures like health maintenance and injury prevention. Veterinarians in the CDC are hired through the U.S. Public Health Service Commissioned Corps. The Commissioned Corps is an organization for public health officers and offers several benefits. These benefits include free medical and dental coverage, paid vacation, low-cost life insurance, and retirement plans. There are several grades of career levels for epidemiologists.

As the grade builds, the requirements of education and experience also increase. The basic is GS-5 which only requires completion of four years of study at an accredited college in the field of the position to be filled. A GS-11 level must have three years of graduate work, Ph.D. degree, or one year of specialized experience. Salary increases with grade. Most jobs are only available to citizens of the U.S. and are subject to background security checks. Opportunities for continuing education are also offered through the CDC. The website for the CDC is www.cdc.gov

USDA—Veterinary Services

Within the USDA is an agency called the Animal and Plant Health Inspection Agency. Within this agency is Veterinary Services. Veterinary Services employs veterinarians to protect the animals of the United States from contagious and exotic diseases. Some actions of veterinarians include developing health programs, importing and exporting animals, monitoring animal health and outbreaks of disease, inspecting animals, and educating producers. Euthanasia and carcass disposal to prevent spread of contagious disease are also mandatory duties of the veterinarian.

Veterinarians in this agency must be graduates of an accredited school of veterinary medicine. The salary range is \$34,000 to 50,000 annually. As with most government jobs, U.S. citizenship is required. The position of a VS veterinarian is more than a full-time job due to overnight stays because of emergencies. Some benefits include paid Federal holidays, vacation days and sick days. Insurance plans for health

and life are offered as well as retirement plans. More information can be found at www.aphis.usda.gov/vs

Food Safety and Inspection Service

The FSIS, which is within the U.S. Department of Agriculture, is also a public health organization. FSIS is mainly focused with the safety of animal food products, such as meat, milk, and egg products. They are responsible for correct labeling and evaluating the safety of animal products that are transported not only between states but between countries.

Within the FSIS, a veterinarian can serve as a veterinary medical officer. The FSIS currently employs 1100 veterinarians as VMOs. Some duties of VMOs are to evaluate safety programs on the farm, during transport, through the processing plants, transport to market, sale of these products to retailers, and the handling and preparation of these food products for final sale to the consumer. Entry-level veterinarians are employed in processing plants or slaughter houses. Epidemiological research is also conducted, sometimes in collaboration with the CDC. VMOs evaluate new inspection programs as well as state inspection programs.

Career opportunities are nationwide. As with government careers, benefits such as paid vacation, holidays, and sick leave are available. Retirement plans, health insurance, and dental insurance plans are also offered. In some areas, a recruitment bonus can be obtained. Requirements are U.S citizenship, satisfactory completion of a medical exam, and D.V.M. degree. Entry-level positions like those in slaughter houses are usually offered to recent D.V.M. graduates without any professional experience.

Entry-level positions with a higher starting salary are accessible to those with at least one year of professional experience or excellent academic accomplishments. Training is provided in both a classroom setting and on-the-site once hired. Promotion is determined by performance, initiative, and mobility. The website is www.fsis.usda.gov

State Veterinarians

State veterinarians focus on animal disease prevention by working towards several objectives. They certify and enforce regulations for interstate and international transport. State veterinarians also monitor diagnostic services of the state. They are responsible for knowing what diseases are most prevalent in the state and where. The state veterinarian must take steps to prevent outbreaks and contain crises when they do occur. The state veterinarian for Tennessee is Dr. Ronald B. Wilson.

Accredited Veterinarians

Becoming an accredited veterinarian is not a career choice, but an enhancement opportunity. Accredited veterinarians could be in private practice or in research at a pharmaceutical company. Veterinarians wishing to become accredited are required to follow the accreditation process. The process includes the following stages: teaching/learning, licensure, application, and seminar. The teaching/learning stage occurs in clinics, labs, and classrooms. They must become licensed by state and national boards. Applications are sent to the APHIS veterinarian in charge and the state veterinarian. The last stage is determined by the state whether the applicants attend an office visit or a seminar. Some general duties of an accredited veterinarian include

following USDA regulations as well as interstate and intrastate policies, and knowledge of reportable and foreign diseases.

Additional Resources

“The Accredited Veterinarian.” Veterinary Accreditation: A Reference Guide for Practitioners. USDA-APHIS-VS. 2002.

www.aphis.usda.gov/vs/nvap

www.avma.org

www.bls.gov/oco/print/ocos076.htm

www.cvm.uiuc.edu/admissions/careers.html

www.vet.utk.edu/savma/wilson.html

III. Pharmaceutical Industry

Veterinarians in pharmaceutical companies research, create, and test animal drugs and other products such as vaccines and antibiotics. Most pharmaceutical firms that hire veterinarians are involved in human health as well as animal health and are known worldwide. The pharmaceutical industry involved in animal health aims at two groups of animals: companion animals and livestock. Through safeguarding the health of companion animals, researchers hope to not only lengthen the relationship between owners and their pets by lengthening the life of the pet, but also protect owners and other members of the public from infectious, transmissible diseases. Products for livestock are directed towards safe food products and thus maximize food productions.

Veterinarians may be employed in three major areas: research, product development, and marketing. In the area of research, veterinarians explore sources of bacterial and infectious diseases. They also research parasite control to reduce vectors which can transmit disease not only to another animal, but also to humans. Within this area, specialized experience in areas such as immunology, parasitology, virology, microbiology, or many others, may be required depending on the research. Within the area of product development, testing of new animal health products is performed. The product is tested as guided by law and usually in accordance with another party such as a practicing veterinarian or university. Veterinarians are also employed in sales and marketing. In this department, the veterinarian follows a product through production and constructs marketing strategies. They also provide information to practitioners and consumers on current products used worldwide.

Some of these well-known pharmaceutical corporations are Bayer, Pfizer, Novartis, and Merck.

Bayer

Bayer is a leading worldwide pharmaceutical company, mostly associated with Bayer Aspirin. Bayer also produces animal health products in their Animal Health department. Bayer Animal Health employs over 3,000 employees worldwide, and produces approximately 100 animal health products. The best-sellers are Advantage®, a flea-control treatment for cats and dogs, and Baytril®, an antibiotic. Bayer also produces vaccines such as foot-and-mouth disease vaccines that are exported to other parts of the world. Of the 190 doctors employed by Bayer, approximately 40% are veterinarians. Of the same 190, about 20% are employed in the Animal Health department; thus some of the veterinarians working at Bayer are not involved in animal medicine.

A doctorate is required, but specialized training in areas such as microbiology, parasitology, virology, and others may only be required for certain positions. Compensation is dependent on the area of employment as well as experience. However, the pay is reported as competitive. Other benefits offered include a pension plan, 401(k) savings plan, and post-retirement benefits. Being a health care organization, special consideration is granted toward employee health through numerous insurance options. Other options include vacation time, holidays, military leave, and bereavement leave. Accommodations for continuing education include educational leave, an educational assistance program, and a company-sponsored training program. For more information, visit www.bayer-animal-health.com.

Pfizer

Pfizer is also a substantial human pharmaceutical company with an Animal Health department. This department provides a third of the global market in animal health products. Pfizer Animal Health produces more than 240 different animal health products. The best-known products are Rimadyl®, an osteoarthritis medication, and Revolution®, an antiparasitic medication. Pfizer offers product and health information on a website only for veterinarians at www.pfizervet.com

A sizeable portion of Pfizer Animal Health is devoted to research. Positions are also available in sales and marketing, finance, technical support, and other business-related areas. Veterinarians in the Animal Health department all have academic training or private practice experience. Many have specialized experience in immunology, epidemiology, internal medicine, and surgery among others. Pfizer veterinarians provide product and disease information support to practicing veterinarians. Numerous benefits are offered such as 100% reimbursement of Pfizer prescribed drugs. Pfizer also offers educational loans and other compensation for continuing education. Pharmacia Animal Health has recently been acquired by Pfizer Animal Health. For more information on employment with Pfizer, go to www.pfizer.com

Novartis

Novartis Animal Health is a pharmaceutical division based in Basel, Switzerland and employs over 2300 people worldwide. Novartis products are directed towards providing treatment for internal and external parasites and allergic diseases. Two popular products are Program® and Capstar®, both flea medications. Approximately 50% of 2001 business was directed to companion animals, 47% for farm animal, and 3% to aqua

health products for farmed fish. Parasite control is the largest product percentage at approximately 60%.

A large portion of Novartis relies on research and development. Within the research and development department, basic academic research is performed at universities; parasiticide efficacy is evaluated, as well as product safety. Novartis Animal Health also evaluates the therapeutic effects of human drugs on animals. More information may be found at www.novartis.com

Merck

Merck is a research pharmaceutical company that is best known for their manuals, such as the Merck Veterinary Manual. The Pharmacology Department utilizes veterinarians to monitor use of animals in research. Merck uses animals as models of human disease to determine qualities of potential drug therapy.

A D.V.M. is required to submit a resume. More opportunities are available to those specialized in pharmacology, physiology, biochemistry, and other fields. Compensation is based on the position and effort put into the job performance. Merck offers retirement plans, paid vacations, and holidays. As well as the other pharmaceutical firms, Merck also focuses on insurance, especially medical with the Merck Medical Plan, offering low-cost medical coverage usually involving a co-payment. However, there is no co-payment if the prescription is a Merck product. Scholarship and educational assistance programs are accessible for continuing education of employees. For more information, visit www.merck.com

Additional Resources

www.avma.org

www.cvm.uiuc.edu/admissions/careers.html

IV. Food Safety

Veterinarians serve as a valuable resource in the area of food safety in a variety of roles. They are involved in every aspect of food production from the farm to the table. Veterinarians can work in any aspect of the food industry such as laboratory testing and even sales and marketing of the food products. Veterinarians are involved in the feed and products for food animals. Veterinarians within the discipline of food science may serve as inspectors of food products such as dairy, meat, and eggs. They enforce local, state, and federal regulations as well as international quality regulations for those products being exported. The regulations include those regarding the slaughter, processing, and shipment of the food product. Veterinarians also provide advice to producers to improve facility conditions, decrease disease and mortality, and increase production by focusing on sanitation and feeding and maintenance of their food animals. Veterinarians also work to devise programs to decrease the threat and risk of disease to the food animals, especially diseases that can be passed to humans.

According to the USDA, poultry and meat products, including the by-products like leather, accounted for a \$125 billion industry in 2001. In meat animals such as cattle, pigs, and chickens, veterinarians monitor the animals for diseases. Monitoring for diseases includes taking blood samples for testing and enforcing quarantines according to USDA guidelines if an animal is diseased. Another occurrence veterinarians test for are drug residues, such as antibiotics, that can be passed on to the consumer. They advise producers on drug use with food animals to ensure dangerous residues are not present at high levels at the time of slaughter. They regulate medicated food like antibiotic feed to make sure the products are being used properly and when needed. They also inform the

producer of withdrawal times of the drugs. If the animal has high drug residues at the time of slaughter, that animal will be condemned, and the producer will have lost money. The animals are inspected before slaughter for injuries like injection scars or bruising. Veterinarians ensure the animals are humanely slaughtered and inspect the carcass after slaughter. After making sure the meat is safe for processing, veterinarians check that the meat was processed sanitarily to decrease contamination. They also enforce HACCP, the Hazard Analysis Critical Control Point, which is a preventive program of the Food Safety and Inspection Service (FSIS) in the USDA that sets up quality control points during the production processes.

In the dairy industry, veterinarians examine the dairy cows themselves, but most importantly, their milk. Laboratory tests determine milk composition, bacterial counts, and any drug residues. One major disease that plagues the dairy industry that involves veterinarians is mastitis. Veterinarians help look for ways to reduce the incidence of the disease as well as preventing the development of mastitis. Veterinarians also advise producers on appropriate drug use and withdrawal times. They enforce regulations for consumption according to state, federal, and international law like meat inspectors. Veterinarians ensure the housing facilities are suitable. The main emphasis is put on the sanitation and cleanliness of the milking, storage, and processing facilities. This is to decrease contamination of the milk collected but also to reduce the spread of diseases like mastitis from cow to cow.

Veterinarians serve similar roles in the egg industry as in the dairy and meat industries. They not only monitor the producing animal, which is the laying hen, but also the egg. Housing is inspected to make sure it is suitable and disinfected properly.

Producers are advised on the appropriate nutrition for the layers and proper drug use. Eggs are inspected before and after breaking. Tests are performed for drug residues and microbials such as *Salmonella enteritidis*. Safety guidelines such as refrigeration of the eggs and egg products, and regulations by state, federal, and international law are also monitored. More detailed information on the egg industry may be found at www.unitedegg.com

By serving as food safety inspectors and providing information to producers on diseases and proper drug use and maintenance, veterinarians serving in food safety careers aid in ensuring the maximal productivity and safety of the Nation's food supply. In doing this, veterinarians ensure that these food products are safe for human consumption and consistent with labeling and distribution regulations. By being involved in inspecting animals before and after slaughter, they ensure no diseased animal is processed for consumption, thus decreasing the possibility of food-borne illness to the human population. They also reduce drug residues that humans can consume that might cause health problems, like allergic reactions. Drug residues also cause a problem with antibiotic resistant bacteria. Veterinarians in the food safety industry benefit public health by ensuring the safety of animal food products.

Today more food companies are becoming vertically integrated. This entitles the company to control every aspect of the production literally from the farm to the table. The company owns the animals and can own the farm on which the animals are raised. They own all the growing, slaughter, and production facilities, as well as their own laboratories. Two such companies that are familiar at the grocery store are Tyson Foods, Inc. and Smithfield Foods. Tyson is best known for their poultry products, but they have

recently expanded to include beef and pork products. Smithfield Foods is best known for pork products. Due to the vertical integration of many food companies, they can now offer a wide span of jobs within that large company. By working in the larger company, pay can become more competitive and benefits are available such as stock options and discounted company products. Another example is that Tyson has its own credit union for its employees. For more information on Tyson Foods, Inc. their website address is www.tysonfoodsinc.com. For more information on Smithfield Foods, their website is www.smithfieldfoods.com.

A good opportunity for veterinarians in food safety is in the government, especially newly graduated veterinarians. All levels of government are involved in food safety from national to local governments. The Food Safety and Inspection Service within the United States Department of Agriculture employs veterinarians as veterinary medical officers. FSIS veterinarians concentrate on microbial control, management of the producers and their facilities, and every step in the progression of the food product from the farm to the table. Other concerns of the FSIS are animal identification and information supervision. Newly graduated veterinarians usually work within slaughter houses. Usually salary and benefits are dependent upon experience and level of education. More information may be obtained at www.fsis.usda.org

Resources:

www.bls.gov/oco/ocos046.htm

www.bls.gov/oco/ocos076.htm

www.cnr.berkeley.edu/ucce50/ag-labor/7manual/7dao073.htm

www.fsis.usda.gov/oa/pubs/vets-final.htm

www.mda.state.mn.us/dairyfood/antibiotic.htm

<http://webs.wichita.edu/ubms/news/1000/1000-3.html>

www.usda.gov/news/pubs/factbook/fb009.pdf

V. Teaching and Research

One opportunity for veterinarians is a career in education, teaching future veterinarians the skills they will need in their practice. This usually occurs at colleges and universities. Veterinarians in teaching are concentrated in veterinary colleges but may also teach in other sciences, like an undergraduate animal science program. Veterinarians teaching at colleges usually conduct various research projects while teaching, so these careers are commonly grouped together. However, the research aspect is not limited to university work, but includes research in the pharmaceutical industry and government laboratories.

Teaching veterinarians conduct lectures and laboratory sessions within their curriculum. Besides the classroom, teaching veterinarians can provide instruction within the clinics of the teaching hospitals. Teaching veterinarians also provide treatment to their own patients as well as act as a resource of advice and experience for referring veterinarians. They also supervise veterinary students and staff within the veterinary teaching hospital.

Research performed by teaching veterinarians is expected to be creative and original. Research can be basic or clinical such as examining a treatment for a certain disease in cats. The animal research performed can be used to treat human health problems. The results are usually published in a professional journal. Sometimes supervision over resident and graduate research is required of a teaching veterinarian at a university. Continuing education and participation in professional committees and service may also be required of teaching veterinarians in universities.

Education beyond a DVM is usually required, such as a master's degree or PhD. Sometimes advanced training or experience in research or teaching is required for many positions. Experience and qualifications usually determine salary. Tenure is attainable and leads to better benefits and job security. Opportunities for advancement into administrative duties are available.

Resources:

www.avma.org

www.awv-women-veterinarians.org/

www.collegeboard.com/apps/careers/0,3477,11-077,00.html

www.upei.ca/~avc/career.htm

www.vet.orst.edu/CAREER/carteach.htm

www.vetmed.ucdavis.edu/StudentPrograms/GPS_02-03/Guide2002p07-09-profes.pdf

VI. Public Health

Public health veterinarians work in all different fields of veterinary medicine, including government, food safety, and the military. Public health veterinarians in the government may work for such federal agencies as the CDC and USDA monitoring animal and human diseases, with interest on zoonotic and food-borne diseases. The United States Public Health Service applies veterinarians to monitor programs of zoonotic diseases. Veterinarians inspect food animals and their products to ensure safety to the consumer. Another role of the public health veterinarian is to educate the public on the emerging diseases and how to protect themselves. Zoonotic and food-borne diseases are not the only concern, but also antibiotic resistance and drug residues that could harm the public.

Veterinarians wishing to work in public health may benefit from obtaining additional degrees such as a Master of Public Health (MPH) degree. This degree takes one to two years to obtain and may be offered in addition to the regular curriculum at the veterinary school. Veterinarians specializing in epidemiology are in high demand in public health.

A subsection of public health that has become more well-known recently is bioterrorism. Private practitioners are at the forefront of biodefense as they are in constant contact with local animals and are usually the first to discover a spread of disease. Veterinarians in other fields also participate in defending against bioterrorism as they monitor chronic and exotic diseases among animals and ensure the safety of animal food products. The threat of bioterrorism is not only that disease could possibly be spread from animals to human, but also the vulnerability of the food supply served by

food animals of being obliterated. Veterinarians even serve in the recently established Department of Homeland Security. Bioterrorism is not a category of employment in itself but is actually numerous departments working together to maintain public and animal health in response to a threat.

Resources:

www.avma.org/onlnews/javma/mar02/s031502b.asp

www.rpweb.uams.edu/ArkansasHealthCareers/VeterinaryMedicine.htm

www.vet.orst.edu/CAREER/carpubhl.htm

www.vetmed.iastate.edu/services/institutes/cfsph/mph.html

VII. Private Practice

Around three-fourths of the practicing veterinarians in the U.S. are in private practice. More than half of those in private practice are small animal clinics that treat companion animals. Other practices include large animal practices which serves horses and farm animals, or a mixed practice that serves a variety of animals, large and small. Private practitioners are responsible for vaccinating against diseases, and diagnosis and treatment when disease or injury does occur. Technical skills such as those for radiology and diagnostic laboratory tests are required for diagnoses. Surgery and prescribing medications are some of the treatment responsibilities. Another important factor is that veterinarians are the link between the pet or production animal and its owner. It is the veterinarian's role to educate the owner on the best ways to care for their animals, such as diet or treatment of a certain illness.

A D.V.M. may be obtained from any of the 27 accredited colleges of veterinary medicine in the U.S. Requirements are dependent upon the school and more information may be obtained at www.aavmc.org. In the final year, a state board exam is taken to license veterinarians to practice medicine. The student veterinarian may decide to specialize in a certain field like dermatology, or within a certain species like equine. With a specialty, the veterinarian can work within a referral center, where private practitioners refer their patients that need specialized diagnoses and treatment, or may open a specialty practice. Specializing in a certain field or species requires more education past the D.V.M. degree. Once licensed, the veterinarian may choose to practice independently or within a group. Private practitioners must also have business skills to maintain the business details of the practice.

Resources:

www.ag.unr.edu/AHB/PowerPoint/Pre%20vet/35

www.avma.org/careforanimals/animatedjourneys/aboutvets/roles.asp

www.mvma.org/career_veterinary_profession.html