UNIVERSITY OF MINNESOTA

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College of Veterinary Medicine

AVMA Self-Study Report

Veterinarians impact the lives of Minnesotan every day

UNIVERSITY OF MINNESOTA
College of Veterinary Medicine

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EXECUTIVE SUMMARY

Overview

The University of Minnesota (University) College of Veterinary Medicine (College) prides itself on the delivery of clinical and diagnostic services, veterinary and public health research and the life-long education of veterinarians and biomedical scientists. Minnesota is well-known for its outstanding faculty and innovative approaches to admissions and education. Research strengths include: infectious disease, genomics, comparative and translational medicine, public health, epidemiology, dairy, swine, and avian medicine.

The College is a national leader in the use of behavioral competencies to select students, the use of experiential education in its professional programs, the training of the next generation of veterinary public health professionals, and the development of innovative methods to recruit and train future dairy and swine veterinarians. Our location in a major metropolitan area ensures access to a large companion animal caseload. Minnesota's strong agricultural and food industry base enhances exposure to a wide variety of food animals and food animal production systems. Our close proximity to the University Medical School, the College of Biological Sciences, the College of Food, Agricultural, and Natural Sciences, and the School of Public Health ensures many interdisciplinary opportunities for faculty and students to promote "one medicine".

In addition to the College's Doctor of Veterinary Medicine (DVM) program, the Veterinary Medicine and Comparative and Molecular Biosciences graduate programs allow students to pursue master's or PhD degrees in genomics, molecular biology, comparative medicine, pathology, internal medicine, surgery, and theriogenology.

Finances--Over the past five years, College expenditures have grown from $52.1 million to $70 million with significant increases in expenditures for instruction, academic support, student services, clinical and diagnostic services, sponsored student aid, and research. State funding has been flat to declining during this time and indirect expenses (University overhead) have increased by more than 100%. The College is under funded compared to other colleges of veterinary medicine. Based on the 2005-06 AAVMC Comparative Data Report (AAVMC Data), the College ranked 18th of 28 colleges in state appropriation per DVM student and 24th of 28 schools in the number of faculty paid with state-appropriated funding. Although the state funding has increased for special compensation and specific initiatives, the percentage of total College expenditures funded by the state appropriations has decreased from 29% of the budget to less than 23% during the past five years. The College has used other sources of revenue, such as clinical and diagnostic service income, to increase the total number of faculty. Presently, the College is 4th of 28 schools in total number of faculty. Faculty numbers increased from 84 in 2002 to 145 in 2006. DVM tuition has increased significantly from 2002 to 2006 with an average of 8.7% for residents and 8.5% for non-residents. As a result, College tuition ranked 6th highest for residents, and 2nd highest for non-residents in the AAVMC Data. With student median debt ranking 5th increases in tuition and student indebtedness have the potential to affect student quality and the success of students following graduation.

Physical Facilities and Equipment—Two new facilities will be completed this year, the Pomeroy Student-Alumni Learning Center and the Equine Center. Classroom and laboratory facilities are considered to be adequate. All large classrooms have undergone significant renovation in the past five years, including cosmetic and technology upgrades. The Veterinary Medical Center's (VMC) facilities and equipment are generally adequate although caseload growth has increased need for additional examination and conference rooms, faculty offices, and pharmacy space. Remodeling projects will address some of these needs. Clinical equipment needs are being met through a recent $11million loan from the University. Facilities for maintaining teaching and research animals are considered adequate, with the exception of large-animal research isolation facilities and large-animal teaching space. The College continues to request replacement of these facilities. All animal holding facilities are AAALAC

accredited and inspected annually by the USDA. Research space is generally sufficient, although much is outmoded and is not configured to support large programs or collaborations. Twelve percent of collegiate laboratories have been renovated in the past five years, and an additional 41% will need to be renovated in the next five years. The College is facing a serious shortage in faculty office space. At present, office needs are being met by remodeling underutilized space.

Clinical Resources--The large VMC caseload creates exceptional learning opportunities and specialized rotations as well as operational challenges. In the past year, both canine (34,746) and feline accessions (8,922) were 1st of 28 Colleges according to the AAVMC data. Increased exposure to equine cases is expected to result from our purchase of an equine practice in Maple Plain, Minnesota, and following the opening of the new Equine Center. Students are exposed to a variety of common medical conditions in unique educational facilities. Students receive excellent exposure to farm animals through the bovine Translational Management Facility (TMF) in Baldwin, Wisconsin, the swine teaching facility in Waseca, and the St. Paul Dairy facility, and through 24 specialized rotations detailed in appendix 4.3.

Library and Information Resources--The Veterinary Medical Library (VML), a part of the University's Health Sciences Library system, utilizes state-of-the-art technology to provide access to print and non-print biomedical information resources. Library and information resources are continually being updated and are considered adequate. As part of a larger space-planning initiative, library space is being examined for possible improvements including reconfiguration of the physical layout, new furniture, and the installation of additional electrical outlets for increased laptop use. Internet cabling of the library is scheduled for an upgrade in 2007.

Students--DVM class size increased from 78 in 1999 to 90 in 2003. Student services are provided by the College and the University. The College assists students with resume preparation, prepares a graduating class resume book, and schedules interviews with prospective employers. In 2003, an early-decision program (VetFAST) was introduced to attract students to careers in food animal medicine. A plan to expand diversity in the veterinary profession is complete and awaits resources to implement. This year the first annual Minnesota Leadership experience (patterned after Washington State) was offered during freshman student orientation, focusing on servant leadership, self-awareness, communication skills, and team building. Currently, 39 M.S. students and 58 PhD students are either in one of the two graduate programs. In collaboration with the School of Public Health, the DVM/MPH dual degree program, launched in 2003, has over 100 enrolled students from 12 veterinary colleges across the nation. In 2006, 8 interns and 34 residents were pursing advanced clinical training.

Admissions--Applicant evaluation includes: 1) academic measures, 2) non-academic measures, and 3) a behavioral interview (see section 7.3 and appendix 7-2 for details). A variety of evaluation techniques are being employed to evaluate the outcome of the College admission process.

Faculty--The College has an outstanding basic science and clinical faculty with 69 tenured/tenure track faculty, 22 contract faculty, and 50 non-tenured clinical faculty. While tenure-track faculty numbers remained stable since 2000, the VMC and VDL used clinical revenue to increase non-tenure clinical professors from 28 to 50 positions (79%). Falling state revenues (as a percent of budget) have made it difficult to increase tenured faculty numbers. While we have significantly increased the number of clinical rotations through the use of clinical income, the high caseload has placed pressure on the amount of available clinical teaching time for faculty in the VMC.

Curriculum--Notable curricular strengths include early introduction of leadership, professional, and clinical skills; emphasis on experiential learning beginning in the freshman year; early exposure to the numerous veterinary career opportunities; ability to earn both a DVM and MPH degree in four years; a unique 3 week public health institute; significant clinical rotation flexibility in the senior year; ability to access an outstanding caseload in the VMC and numerous external rotations; and the Summer Scholars Research Program. Curricular weaknesses include an uneven course load distribution during the first 3 years, the need to expand some basic science courses (e.g., physiology), lack of a core course focusing on

clinical reasoning (problem-solving), and challenges related to integrating clinical and basic sciences. The curriculum is continually assessed and recommendations are made by the Committee on Curriculum and Educational Policy (CCEP).

Research Programs— Faculty participate in basic, translational, and clinical research programs focused on food animals, companion animals, wildlife, and public health. Research programs are focused in areas of infectious disease (especially economically important food animal diseases, emerging infectious diseases and zoonoses) and in comparative medicine (especially the use of spontaneous animal models of human disease). Most faculty have advanced research training and integrate research principles into their lectures and laboratories. Students are exposed to research in the VMC through the Clinical Investigation Center, rotations at the TMF and swine farm, and through the Summer Scholars Program.

Outcomes Assessment--The following are used to assess the quality of our DVM teaching program:

- **NAVLE (NBE and CCT) Scores:** Students exceed the COE stipulated pass rate (80%) for all of the past 5 years except 2006. The pass rates were 88% (2002), 88% (2003), 96% (2004), 84% (2005), and 79% (2006 preliminary results from the Class of 2007 - November/December test window).
- **Student Attrition Rates:** The attrition rate for personal or academic reasons remains extremely low.
- **Employment Rates:** Employment rates were 100% (2000), 100% (2001), 92.5% (2002), and 97.6% (2004).
- **Survey of Graduates at One, Three, and Five Years Post-Graduation and Employer Focus Group Results:** The percentage of graduates who strongly agreed or somewhat agreed with the statement "I feel the College prepared me well for my career" was 88% (2002), 84% (2003), 90% (2004), 92% (2005), and 88% (2006) each year exceeding our bench mark of 80%. Students reported feeling less well-prepared (compared to the importance of the discipline) in cardiology, ophthalmology, and radiology. Employer focus group results did not identify deficiencies in these disciplines. Employers report that graduates distinguish themselves in technical and computer skills, medical knowledge and skills, small-animal surgical skills, alternative treatment methods, and interpersonal and communication skills. Areas for improvement include time-management skills, networking skills, business acumen, ability to multi task, and realistic expectations of working in a small-animal practice. Plans to improve in these areas are described in the report.
- **Standardized Competency Assessment Plan:** A formal assessment of technical and non-technical competencies in clinical rotations was initiated this past year.

OBJECTIVES

1. Major goals and objectives of the College and how they are being met (see appendix 1-1)

Goal 1: To improve the health of animals and people by enhancing the vitality and depth of research programs

Research expenditures have increased significantly since our last site visit ($9.6 million to $14 million) with faculty obtaining several large multidisciplinary grants. Faculty are hired to focus on research priorities that are aligned with our goals and budget and to help increase NIH, NSF, and USDA funding. Excellent faculty have been hired although recruitment has become more difficult as competition increases. More laboratory space needs to be remodeled to remain competitive. A balance exists between faculty who work on agriculturally important diseases and companion animal diseases, and those working on animal models of human disease. Faculty leverage relationships with private industry to enhance research resources and this will continue to be a priority. As state and federal funding declines, it will become more difficult for the College to maintain a critical mass of faculty who will perform research on agriculturally important problems.

Goal 2: To improve the health of animal and people by preparing students, graduates, faculty, and staff for successful careers

Although we have not had a major curricular revision since the last site visit there have been significant curricular improvements. Strengths of the curriculum include emphasis on leadership development; emphasis on experiential learning; increased options in clinical rotations; high small-animal caseload; creative collaborations for large- animal exposure; excellent production-based dairy, beef, small ruminant, and swine programs; emphasis on veterinary public health, a flexible DVM/PhD program; and mentored research experiences. We continually review outcomes data to ensure that the curriculum is meeting the needs of students and their employers. It is especially important that we increase the number of collaborative learning opportunities within the University and with other colleges of veterinary medicine. Lack of diversity in our student populations remain a problem and we are presently seeking funding to implement our diversity plan.

Goal 3: To improve the health and well-being of animals and people by enhancing the veterinary health care delivery system

Over the past five years, the VMC has experienced a 9.4% increase in accessions and 29% increase in hospital days for companion animal case. New clinicians have been hired, and new clinical rotations have been added. The rapid growth has significantly increased clinical workloads and placed a strain on the clinical teaching program. Two years ago, we conducted a business analysis that suggested the VMC needed to increase revenues, reduce expenses, enhance infrastructure investments, reorganize its management structure, and create an advisory board. Revenues will increase as we develop centers of excellence and the College is implementing recommendations for efficiency improvements (call center, integrated scheduling, new compensation plan, EMR.). The University has loaned the VMC $11 million to make infrastructure investments (MRI, linear accelerator, and remodeling projects). Dr. David Lee was hired as the VMC director, the management of the VMC has been reorganized (see appendix 4-1), and business planning for the next five years is in progress. The VDL is a thriving animal health laboratory with $8.4 million in revenue. The laboratory focuses on developing new molecular-based diagnostic tests and porcine serology testing comprises the largest revenue source. Requests for testing continue to grow at a rapid rate. Rapid growth has significantly increased the workload of VDL faculty, necessitating the hiring of additional faculty. Hiring of diagnostic pathologists remains a challenge because of the lack of students in training programs and the demand for pathologists in private industry. Marketing plans are underway to ensure the continued success of the laboratory. The college actively engages various

commodity groups, and local, state, and federal agencies to stay informed on issues and to provide guidance on scientific and policy-related issues.

Goal 4: To improve the health of animals and people by positioning the College for long-term financial sustainability

A detailed analysis of the College's financial health is presented in section three of the self-study. The College has significantly increased tuition, sponsored research, VMC revenue, and VDL revenue since the last site visit. Sate funding has been flat to declining. The overhead paid by the College to the University has increased significantly (from $.5 million to $5 million). It is imperative for the College to increase revenues from all sources and to reduce expenses. Plans include: 1) a request currently before the state legislature for $3.5 million, 2) increasing private funding in the next five years, and 3) hiring faculty with the expectation of significantly increasing the level of sponsored funding while keeping tuition increases to a minimum.

2. Methods used to measure outcomes of the total program of instruction, research, and service

The College benchmarks both financial and non-financial metrics with data in the AAVMC comparative data report and with other UMN schools and colleges (see appendix 11-2). Outcome assessments are described in the executive summary and detailed in Section 11. Our outcomes assessment plan includes surveys of students, graduates, employer focus groups, and competency assessment. The Cabinet is presently establishing a goal for each benchmark and the data will be reviewed each year by a committee who will make recommendations. If the goal is not met, the Cabinet will develop improvement strategies or refer to the appropriate committee for action.

3. List the major strengths and weaknesses of the College

Strengths: Outstanding, hard-working faculty, staff, and students, good to excellent facilities, good relationships with the veterinary community, commodity groups, and University, successful industry and government partnerships (e.g., Hills Pet Nutrition for more than 30 years, food industry, state and federal government), strong Clinical Investigation Center that supports clinical and translational research through industry partners (e.g., Pfizer Animal Health). Entrepreneurial faculty, multiple research centers, teaching faculty well represented in specialty college memberships, innovative admissions process and curriculum, growing NIH research program, successful dual-degree programs (DVM/PhD and DVM/MPH), excellent VMC caseload and clinical rotation options, innovative production animal educational opportunities (TMF, swine farm, and St. Paul Dairy), and successful VDL.

Weaknesses: Relative lack of state funding compared to other CVMs, relatively low numbers of tenured/tenure-track faculty supported by state funding, relatively low faculty salaries compared to peers, increased time pressure on faculty in clinical teaching programs in VMC and VDL, lack of adequate capital for infrastructure enhancements, roles and responsibilities not clearly defined for clinical professors .

4. Recommendations

- Complete objectives in the 2006-2009 Strategic Plan
- Continue to increase financial, human, and physical resources supporting research, teaching, and service
- Continue to reduce expenses
- Continue to focus investments on high-priority areas
- Continue to hire outstanding basic and clinical faculty
- Continue to analyze programs and identify programs to be enhanced and programs that can be eliminated or presented in a different manner (e.g., partnerships with other CVMs)
- Continue to enhance the image of the College in the University and the state
- Continue to strengthen the collegiate leadership team
- Continue business planning in departments and centers to align with the University
- Conduct an analysis to determine space needs in next 5-10 years

STANDARDS

1. ORGANIZATION

Founded in 1851, the University, with its four campuses (Twin Cities, Duluth, Morris, and Crookston), a collaborative center in Rochester, eight regional extension offices, and research and outreach centers throughout the state, is one of the most comprehensive land-grant universities in the nation.

The College is one of the few in the United States located in the center of a large metropolitan area. Minnesota practicing veterinarians prepared by the college have increased from 403 (in 1945) to 1648 (in 2005). The College has significantly increased its outreach to neighboring states to meet the educational needs of veterinary students and clinical needs of referring veterinarians and clients.

1.1 The College mission

The College impacts the lives of animals and people by educating current and future veterinarians and biomedical scientists; discovering and disseminating new knowledge and skills; and providing state-of-the-art veterinary services.

1.2 The DVM program mission

The DVM curriculum teaches critical thinking and problem solving, encourages leadership, facilitates experiential learning, and uses technology to enhance the learning process in order to educate future veterinarians who will improve the health of animals and people.

1.3 University administrative officers

The University is governed by a Board of Regents whose 12 members are elected by the legislature. The president of the University, Dr. Robert H. Bruinicks, and its chief operating officer, E. Thomas Sullivan, head the Twin Cities campus in addition to serving as system-wide administrators (see appendix 1-2). The University is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools (NCA). Founded in 1895, NCA is one of six regional accrediting associations in the United States. Through its commissions, NCA accredits educational institutions in the 19-state North Central region: Arkansas, Arizona, Colorado, Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, North and South Dakota, Nebraska, Ohio, Oklahoma, New Mexico, Wisconsin, West Virginia, and Wyoming. The Higher Learning Commission of NCA is recognized by the U.S. Secretary of Education and the Council on Higher Education Accreditation (CHEA).

1.4 University organizational structure

The College is one of seven schools and colleges that comprise the Academic Health Center (AHC), led by Senior Vice President Dr. Frank Cerra. Disciplines include: dentistry, medicine, nursing, pharmacy, public health, and veterinary medicine. Centers and programs provide opportunities for interdisciplinary teaching and research in bioethics, cancer, genomics, infectious disease, drug design, food safety, and spirituality and healing (see appendix 1-3).

The dean reports to the senior vice president for health sciences, who reports to the president of the University. The University is one of a few universities that combine an academic health center and a college of agriculture and natural resources. This organizational structure provides the College a significant strategic advantage in its ability to train veterinary and graduate students, to recruit faculty, and to generate new knowledge that improves both the health of animal and people.

1.5 College organizational structure

The dean is a veterinarian, has a master's degree, and is board certified by the American College of Veterinary Internal Medicine. The College consists of three academic departments (Veterinary Clinical Sciences, Veterinary Population Medicine, and Veterinary and Biomedical Sciences) and four centers (VMC, VDL, The Raptor Center, and the Center for Animal Health and Food Safety), which report directly to the dean (see appendix 1-4). All department and center directors are veterinarians.

1.6 Role of faculty, staff, and students in the governance of the College

The College operates using a constitution and a set of bylaws, with faculty, staff, and students elected or appointed to committees (see appendix 1-5). The committees are formed on an annual basis with recommendations from chairs, self-nomination, or recommendations from the Faculty Council (see appendix 1-6). The dean meets regularly the chair of the Faculty Council and attends their meetings. The Faculty Council is invited to participate in leadership meetings on topics of interest. Students are represented on many College committees and participate in their own governance structure. SCAVMA and Student Council are very active within the College.

1.7 Change in current organization

There are no planned significant changes in collegiate organizational structure.

2 FINANCES

2.1 Analysis of trends

See appendix 2-1 showing tables A and B for past five-year expenditures. Revenue in Table B is reported as expenditures rather than allocation appropriation or awards.

Analysis of trends of sources of funds – Total expenditures for the College have increased from $52.1 million to $70 million during the past five years, representing a 34.2% increase. Some of the major changes in sources of income (Table B) are as follows:

State appropriations – Expenditures from O&M and State Special funding have increased by 5% from 2002 to 2006. Generally, the O&M and State Special appropriation funding has been flat to declining during that same time frame. Increases have come from recurring and non-recurring funding for special initiatives.

Tuition and fees – Expenditures have increased by 83% from 2002 to 2006. DVM class sizes have increased from 80 to 90 students during the past five years. Tuition rates have increased an average of 8.6% during that time frame. Tuition from graduate programs has also increased during the past five years from increased tuition rates and enrollment.

Endowments and gifts – Expenditures from endowments have fluctuated by year, but increased a total of 17% during the past five years due to investment performance. Expenditures from current gifts have increased by 6%. Fluctuations during the time period are a result of major campaigns and activities such as the 2006 national SAVMA Symposium. Without the symposium expenditures of $190,000, the change in expenditures funded by current gifts from 2002 would have been a decrease of 1%.

Sponsored program income and indirect cost recovery – Expenditures have steadily increased from 2002 to 2006, for a total increase of 25%. NIH expenditures have grown 8% and USDA expenditures have increased 112% during the past five years. Indirect cost recovery funds (ICR) have grown 12% during this time.

VMC/VDL – VMC expenditures funded by client revenue have grown 37% during the past five years, with the addition of new faculty and services. Expenditures funded by VDL user fees have increased 81%, with new facilities, testing capabilities, faculty, and staff.

Other sales and services – Expenditures have also increased significantly, with an 87% increase during the past five years. The major areas of growth have come from Continuing Education and Ross/St. George University student rotation income. The 2006 national SAVMA Symposium expenditures in this category were $155,000. Without the symposium expenditures, the increase from 2002 would have been 77%.

Analysis of trends of direct and indirect expenditures – Some of the major changes in categories of direct and indirect expenditures (Table A) are as follows:

Instruction - Amounts have increased by 26% from 2002 to 2006, primarily due to increased numbers of faculty and increased faculty compensation costs. The large increase in 2004 is also due to the creation of the Center for Animal Health and Food Safety.

Academic Support - Expenditures have increased 45% during the past five years due to improvements in collegiate infrastructure and increased compensation costs.

Student service - Expenditure growth has been 161% during the past five years, driven in the past year by the 2006 national SAVMA Symposium. Without the $345,000 symposium cost, the increase in Student Services costs over the past five years would have been 46%. The remaining growth is due to increases in the Academic and Student Affairs (ASA) staffing to support the larger student enrollment and increases in student-related activity expenses.

VMC/VDL - Direct expenditures for the VMC have increased by 38% from 2002 to 2006 as a result of additional faculty and service offerings, compensation increases, and inflationary increases in laboratory and medical expenses. Faculty salaries associated with clinical teaching and service were transferred to the VMC budget starting in 2004. Direct expenditures for the VDL have increased by 77% during the same time frame due to additional faculty/staff and testing capability, compensation increases, and inflationary increases in laboratory supplies and services.

Sponsored student aid - Expenditures have increased 16% over the past five years from endowments and current gift funding for student support.

Sponsored research/other sponsored activity - Expenditures for sponsored research have increased by 10%, primarily due to increases in USDA and NIH grants. A large corporate-sponsored grant has been reduced by 23%, which has offset growth in other areas. Other sponsored activity has increased by 28%, driven by increases in endowed research activity and research funded by external sales.

External and public service - Expenditures have been reduced by 2% during the past five years, driven by reductions in State Special appropriation funding for the VDL.

Indirect Expenditures have increased by 111% as a result of increased allocations of University overheads, which grew from 3.75% of revenue to 8.5% of revenue during the five-year time frame. The increase in assessment rate, as well as the growth in College revenues during the past five years, resulted in an increase of University overhead expense from $1.6 million to $4.7 million.

2.2 Strengths and weaknesses of revenues.

The College perceives itself as under-funded in comparison with other colleges of veterinary medicine. The University ranks 18th of all 28 colleges of veterinary medicine, in state appropriations per DVM student based on the AAVMC Data. Minnesota was also ranked 24th of 28 schools on the number of faculty paid with state- appropriated funding, but was ranked 4th of 28 schools for the number of total faculty employed. Although the dollars have increased, the percentage of total College expenditures funded by O&M and State Special appropriations has become a smaller portion of the overall collegiate budget, decreasing from 29% of the budget to less than 23% during the past five years. As a result of the decreased state appropriation funds (in inflation-adjusted terms), the number of tenure-track faculty positions has remained relatively constant over the past five years.

A major strategy of the College has been to increase revenues from federal, private, and clinical fund sources in order to reduce dependence on state appropriations. Tuition has increased significantly from 2002 to 2006. The College increased the number of students in the DVM program to 90 per class to increase the number of food animal and public health veterinarians, which also increased the tuition revenue. The College has also increased the number of Caribbean school student rotations to bring in additional revenues. Increases in the graduate program enrollment have also generated additional revenues. Tuition rate increases for DVM and graduate school students have increased substantially over the past five years. The DVM tuition has increased by an average of 8.7% per year for residents and 8.5% for non-residents during the past five years. As a result, University tuition ranked sixth-highest for residents and second-highest for non-residents based on the AAVMC Data. University students ranked fifth in median educational debt in the same AAVMC report. The College is concerned about the high

cost of tuition and student indebtedness and the potential impact it has on the quality of students coming to Minnesota and the success of students after graduation. In 2007, the College reduced the rate of increase for DVM tuition.

VMC and VDL revenues have increased significantly during the past five years. The high caseload has allowed the College to increase the number of clinical rotations. Clinical revenues have also provided necessary funding to make infrastructure improvements, providing a state-of-the-art learning experience for DVM students.

Although sponsored revenues have grown during this time, the College is developing strategies to increase NIH funding and to obtain grants with higher salary savings and indirect cost rates to improve our financial stability. There is rising cost pressure from laboratory renovation expenses and new-hire startup packages that require increased financial benefit from our research grants.

Revenues from gifts and endowments have not kept pace with the rest of the collegiate funding. Growth in sponsored financial aid has been modest, and with the escalating cost of tuition, it makes recruiting of the best student candidates more difficult. Large facility construction/renovations and equipment purchases have been delayed due to funding shortfalls from existing resources. Recruiting top researchers has been difficult without endowments and current gifts to fund salary and equipment. Development staff has increased to focus on major campaign priorities.

2.3 Trend analysis of revenue sources supporting the professional teaching program

Chart C (see appendix 2-2) shows expenditures for the DVM program (including the categories of instruction, student services, sponsored student aid, and the VMC) have increased from $24 million to $33 million during the past five years. While the amounts have increased, there has been a noticeable shift between funding sources. The percentage funded by tuition has grown from 21% to 28% of total expenditures, state O&M has decreased from 22% to 15%, clinical income or other external sales and service revenues has fluctuated from 56% to 59%, and endowments or current gifts has ranged from 1 to 2%.

2.4 Revenue impact on ability to provide contemporary professional teaching program and ancillary support services

The College has used the revenue growth to make improvements in the professional teaching program. Investments have been made in classrooms, library, teaching laboratories, and student lounge facilities to improve the technology, comfort, and safety for students. Resources in ASA, the library, and the computer laboratory have been increased. Numbers of academic faculty have increased significantly, from 84 in 2002 to 145 in 2006. The large VMC caseload has allowed the College to increase student clinical rotations to more than 65 choices to meet student needs. Negative consequences of reduced O&M funding for instruction include a reduction in the number of research-based faculty teaching in the DVM program and cutbacks in departmental support staff and teaching animals. In the elective surgery and anatomy laboratories, the number of students per table has been increased to reduce teaching animal costs. Despite the best planning, the college has not been able to precisely match the increasing clinical caseload with the teaching infrastructure.

2.5 Comparison of VMC income to total VMC operational costs

The VMC is funded by tuition, state O&M, clinical income, philanthropic gifts, and revenues from Caribbean student rotations. In 2006, there was additional funding from an internal loan to reinvest in the VMC facilities, equipment, and internal systems and processes. Chart D (see appendix 2-3) illustrates the relationship between VMC expenditures and VMC income, excluding the tuition and state funding. As is shown in the chart, clinical income alone is not sufficient to cover VMC expenditures. The drop in income percent to expenditures since 2004 has been driven by two factors. The College changed its

methodology for distribution of faculty salaries between the academic departments and the VMC. The VMC now pays for all salary and fringe benefits for faculty effort supporting clinical teaching and service. The percentage of faculty paid by the VMC has grown from 44% in 2002 to 53% in 2006. The VMC has also been allocated larger amounts of state O&M and tuition dollars to cover a portion of the increased salary. The second driver in the recent drop of clinical-income-to-expenditures ratio is due to the spending for new initiatives in the VMC, including facilities, equipments, systems, and processes. Those initiatives have been funded by an internal loan to the VMC and collegiate reserves. Incorporating all sources of revenues, the VMC has operated in an operating deficit during 2002-2004 and an operating surplus the last two fiscal years.

2.6 Anticipated trends in future revenues and expenditures

The College expects to see continued increases in VMC and VDL revenues, with increasing caseload and modest price increases. Tuition funding will continue to grow at a slower rate than has been experienced in the past. State O&M and State Special appropriations are expected to stay flat or decline. Research revenue is projected to increase in anticipation of more salary savings and indirect cost recovery on those future grants. Since the creation of the Clinical Investigation Center, funded clinical trials continue to increase which will improve its competitiveness for comparative medicine grant funding. More emphasis is being put on resource development, so endowment and gifts are expected to increase.

Collegiate expenses will continue to face upward cost pressure. The College continues to recruit new faculty and staff to support all areas of the mission. Currently, Minnesota ranks 21st in professor mean salaries, 24th in associate professor mean salaries, and 10th in assistant professor mean salaries, according to the AAVMC Data. The salary differential is further compounded by Minnesota's higher cost of living. Salary increase rates are expected to rise from the previous five years to improve the College's competitiveness, and the cost of medical benefits is expected to outpace general inflation. The College has plans for significant renovations in research laboratories, the VDL, and the VMC in the next five years. In addition, the Equine Center and Pomeroy Student-Alumni Learning Center will open in 2007, increasing annual operating costs.

The University changed its financial model for distributing central overhead to the colleges in 2007 with an impact of increasing overhead expenditures by $6.4 million. The University also changed the revenue attribution methodology for student fees and ICR, transferring all generated revenues to the colleges and represents an additional $1.1 million. The funding shortfall produced by the increased expenditures offset by the increased revenues was reduced by an increase in O&M funding of $4.7 million. While this change resulted in a net expenditure increase of $.6 million in 2007, the College believes it will be better off under this model in the future. Future revenue growth will not automatically be assessed with additional overhead expenses as under the previous model, so there are opportunities for financial improvements if revenue growth exceeds the growth in University central services expenses.

The College is aware of the future challenges to finance the investment in strategic priorities and inflationary cost increases. Opportunities to reduce expenses and generate new revenues have been evaluated for this fiscal year and will be reviewed on an annual basis to ensure the College's continued financial stability.

3 PHYSICAL FACILITIES AND EQUIPMENT

3.1 Major functions/activities that take place in the facilities

The College's facilities are located on the University of Minnesota's St. Paul Campus. Four connected buildings and five support structures are in close proximity on campus. Three associated facilities for large animal teaching and research are off-campus. The major buildings, support structures and associated facilities are described below.

Major Buildings

Constructed in 1976, the **Animal Science/Veterinary Medicine (AS/VM)** building is a four-story, 126,994 assigned square feet (ASF) structure, of which 49,548 square feet are assigned to College and houses departmental offices, conference rooms, and research space for three departments: 1) Veterinary and Biomedical Sciences – microbiology, immunology, pharmacology, neurosciences, anatomy, biochemistry, epidemiology, genetics, and genomics; 2) Veterinary Population Medicine (VPM) – theriogenology and swine sections; and 3) Veterinary Clinical Sciences (VCS) – physiology, biochemistry, pharmacology, oncology, and osteoarthritis. The building also houses two of the three major classrooms used for the DVM curriculum; the anatomy teaching laboratory; the histology teaching laboratory, which also serves as a home room for the first-year class; and a lounge and mailboxes for the first-year class. This building is also home to the Minnesota Veterinary Historical Museum.

The **Veterinary Science (VS)** building is a four-story, 82,374-ASF structure constructed in stages between 1940 and 1960, with extensive remodeling in 1981. The building houses the departmental office for Veterinary and Biomedical Sciences, conference rooms, and research laboratories for clinical pathology, microbiology, parasitology, and avian medicine. This building houses one of the three major classrooms used for the DVM curriculum, as well as two teaching laboratories used for clinical and gross pathology, microbiology, and parasitology laboratories, and a lounge for the third-year class. The Veterinary Medical Library, Computer/Audiovisual Laboratory, and research animal housing facilities are located in the building.

The **VMC** building is a four-story, 216,972-ASF structure constructed in stages between 1940 and 1980. The original structure served as the small- and large-animal veterinary medical center until 1982, when VMC functions were largely moved into the new VMC building. The VMC complex houses seven major functions: 1) the Small Animal, 2) the Large Animal, 3) the VCS department, 4) the VPM department, 5) administration, 6) offices space for residents and interns, and 7) research laboratories of VCS and VPM faculty, and ancillary functions such as a student lounge, Veterinary Student Services (the student bookstore), the SCAVMA, and nursing mothers room.

The **VDL** building is a three-story, 58,793-ASF building originally constructed in 1961, with major additions in 1992 and 2004. The building houses the VDL; the VPM offices; research laboratories; and several service laboratories for the VCS department. A 5,049-square-foot bacteriology, molecular diagnostics, and mastitis laboratory was constructed in 2004 with funding from a state appropriation. A 760- square-foot alkaline hydrolysis digester was added in 2004 to manage animal remains more safely and effectively.

Supporting Structures

The **Ben Pomeroy Student-Alumni Learning Center** is a 9,000-ASF building that received $5.2 million in legislative and University funding for renovation as an educational center for students, alumni, and practicing veterinarians. The facility will open in March 2007 and will include a large classroom for 90 students, a classroom for 45 students, two seminar rooms, student lounge, commons areas, cafeteria, and offices for ASA and the Veterinary Public Health Program.

The new **Equine Center** will be completed in Fall 2007 on the northeast corner of the St. Paul Campus. The $13.9 million, 60,000-square-foot facility is being financed through a combination of private gifts and University funding and will be used for clinical teaching, clinical service, and research. The facility includes an area for lameness evaluation, including a lunging area and treadmill, surgical suite, laboratory, and clinical space for a new sports medicine program, reproductive medicine, and teaching. It will also include an indoor arena and conference center.

Large Animal Holding is a 21,330-ASF structure, constructed primarily in 1973, with an addition in 1998. The original structure provides space for laboratory instructional programs in surgery, large animal medicine, theriogenology, and to a lesser degree, for anesthesiology, anatomy, physiology, and pharmacology. Teaching animals (food, fiber, and equine) are housed here. When available, animal space is contracted out to intramural and extramural research programs. These facilities are managed by the University Research Animal Resources (RAR).

Three **BSL2 isolation research units** provide a total of 12,542 ASF and are in continuous use by faculty engaged in large animal and poultry research. Units A and B provide the best BL2 isolation facilities. These facilities are managed by RAR.

The **Gabbert Raptor Center** is a 17,749-ASF structure built in 1987. This facility provides space for treatment and rehabilitation of raptors, public education, and staff offices.

Associated Facilities

Transition Management Facility. The College has invested $900,000 to establish an on-farm dairy rotation program through a collaboration with a farmer in Baldwin, Wisconsin. The program is devoted to education and applied research in dairy production and veterinary medicine.

St. Paul Dairy is located on the campus, one mile from the VMC. This 150 cow dairy provides an ongoing caseload for the VMC and is used routinely by the theriogenology program to research bovine palpation.

Swine Research Farm is located in Appleton, Minnesota, 150 miles from the St. Paul campus. The College has access to excellent facilities to conduct large-scale, whole-farm infectious disease research through a partnership with a local farmer. The facility serves as a primary location for teaching swine production medicine.

Rosemount Research Farm, located 45 minutes south of St. Paul, houses animals on long-term studies and is managed by RAR. Facilities include a summer pasture area, pole sheds and barns to house horses, cattle, goats, and swine.

3.2 Area map

Appendix 3-1 is a map of principal facilities including distance and travel time to off-campus facilities.

3.3 Adequacy of College facilities

Appendix 3-2 describes the improvements made to College facilities over the past five years. A space inventory was conducted in 2001 using the Minnesota Facilities Model which identified a need for 40,000 additional square feet (in addition to the Equine Center). The amount of instructional laboratory space was considered adequate, but required upgrading equipment and finishes. Research facilities were considered sufficient in total square footage, but outmoded and poorly configured. Office space was not sufficient to meet the needs of projected faculty and staff growth. The study also highlighted the need for a 26,000-square-foot BSL-3 isolation facility located on campus.

Safety measures
The University's Department of Environmental Health and Safety (DEH&S) maintains a University-wide health and safety program. DEH&S has expertise in all areas of potential hazards and provides information, advice, and assistance to maintain adequate safety measures. The College's health and safety committee routinely conducts employee training and instructional programs and sponsors facility-wide chemical cleanup days. Departmental research safety officers (RSOs) conduct periodic inspections of research laboratories to determine compliance with safety and health standards and regulations. Principal investigators and laboratory managers are responsible for safety procedures in their laboratories. Chemical and biological hazard disposals follow University protocols, and routine certifications are conducted of biological safety cabinets and chemical exhaust hoods. A chemical inventory database is being developed for all laboratories within the college.

The dispersed entry points to the complex present security challenges. Each major building entrance is equipped with a card-swipe reader and outdoor security has been improved through the installation of more lighting and use of University escort services. Building code deficiencies including automatic sprinkler protection, emergency lighting, and enunciator systems also represent facility safety issues and are being addressed as renovation projects are completed. Renovation plans for the VMC will require upgrades of safety systems, including automatic sprinkler protection.

Classroom, laboratories, and other instructional environments and related equipment
Classroom facilities are considered adequate although they have uneven technology and support. Three classrooms large enough to accommodate a full class (90 students), and a fourth classroom will soon be available in the Pomeroy Center and are centrally scheduled. The majority of lectures and large class activities in the first three years of the DVM program are taught in these rooms. Each student class is based in the room closest in proximity to that class's mailboxes, lounge, and lockers. Most large group rounds and seminars are scheduled in AS/VM, high-quality lecture rooms with excellent audiovisual support services. Another classroom, A325, was previously used but deemed inadequate and currently serves as office space for residents and interns.

The classrooms have been renovated in the past five years. 145 VS renovations included paint, new flooring, furnishings, and improvements in lines of sight, acoustics, and lighting. Even with the renovations, this classroom is not optimal space, given its long, narrow shape. Heating and ventilation systems were upgraded in the three large classrooms, and the installation of environmental monitoring equipment facilitates faster response when temperature fluctuations occur. Students occasionally complain about odors in Room 145 emanating from the tissue digester under certain wind conditions, which was addressed by changing the digester operational processes. The College does not have a large (250 person capacity) auditorium, which would facilitate lectures or events for more than one class or a combination of faculty and students. The Pomeroy Center's expanded classroom facility will seat 145 students.

The College has increased the number of seminar rooms for elective courses and senior rotations and will gain two more in the Pomeroy Center. A 420-square-foot room was created in 2003, with flexible seating arrangements and technology connections. 215 VS was upgraded with HVAC and media system. Upgraded rounds rooms are now available for surgery and internal medicine. Seminar room space, which is also used for departmental and administrative functions, is often inadequate for current curricular and service functions. The 2002 space study identified a need for 8-10 seminar rooms, of which four have been added.

The three lecture rooms are supported by University Classroom services and equipment for these rooms is considered adequate. The classrooms include full presentation capabilities and power outlets for student computers. All three large classrooms have mounted video projectors, computer projection capabilities, and computers in the room. The classrooms are wired for power at each student seat and have wireless Internet access.

All faculty have access to computers in their offices and are connected to the Internet with some wireless capability. There are 10 servers, located in three different places across the Twin Cities campus, to support collegiate teaching and research functions which is served by IS help desk professionals. In addition to the computer laboratory, the College provides computers in the first-year homeroom area.

Teaching laboratories

There are good facilities for laboratory instruction in both the preclinical and clinical sciences, with 29,560 ASF of general and specialized instructional laboratories. The support and storage areas for these teaching laboratories are also adequate. The number of workstations in the first-year teaching laboratory was increased to accommodate the larger class sizes. The microbiology teaching laboratory was upgraded with a new air-conditioning system in 2004 and a new audiovisual system in 2006. The pathology/necropsy laboratory was renovated in 2003.

3.3.c. Teaching VMC(s), pharmacy, diagnostic imaging, diagnostic support services, isolation facilities, intensive/critical care, necropsy, and related equipment

The VMC's facilities and equipment are generally adequate, although the growth in caseload to 45,000 cases has put a strain on facilities that were originally designed for 18,000 cases per year. With the growth of small-animal caseload, there is need for additional examination and conference rooms, service areas, and faculty office space. The Minnesota Board of Pharmacy has found that the pharmacy work space is too small for the volume of activity. Teaching space and special holding rooms are adequate. In 2006, the VMC completed a feasibility study to determine space use options.

The opening of the Equine Center will address the lameness evaluation area concerns as well as provide excellent teaching, research, and service areas. Air quality and cleanliness issues in the existing Large Animal facilities have been dealt with by adding additional staff to dust, wash, and hose down the area daily, and by changing the process for moving shavings to minimize the environmental dust in the area. Temperature control and ventilation in the Large Animal facility remains an issue.

The current diagnostic imaging facilities and clinical laboratories, including clinical chemistry, hematology, surgical pathology/immunology, virology, toxicology, parasitology, and hormone assays are adequate. The VDL facilities are good to excellent in terms of space and equipment.

The VMC large animal isolation unit can accommodate eight large animals, four designated for bovine and four for equine patients. The design and number of units has been adequate for the isolation of clinical cases. The small animal isolation unit contains five isolation cages. This facility has proven to be adequate, although it is short of general space in the kitchen, housekeeping, clothing changes, and storage areas.

Necropsy services are provided in the VDL. Space includes one walk-in cooler, three dock spaces, 10 tables plus one hydraulic lift table, and an overhead monorail system. Space is adequate for BSL-2 necropsy activity. The College is in process of constructing a BSL-3 facility for high pathogen necropsy activity.

Clinical equipment is generally adequate for teaching. However, the College and its faculty desire to be a state-of-the-art resource for the veterinary profession. Existing equipment is becoming outdated and

replacement costs are high. Most equipment is repaired, or parts are replaced. The VMC budgets approximately $200,000 each year to purchase new or replacement equipment and $200,000 for facility-related projects which are funded from VMC income and gifts. This amount has been increased from previous levels. The College has received approval for an $11 million loan from the University to reinvest in VMC equipment and facilities. In addition to the major equipment purchases, the VMC has been accelerating the replacement of computers for student and staff access to patient medical records. The VMC implemented the University Veterinary information system (UVIS) in 2001 to support accounting, patient management, inventory, electronic medical records, and pharmacy. The VMC is part of the national UVIS users group, which collaborates on ongoing system improvement projects.

The VDL currently uses user fees for the purchase of new equipment, as the state does not provide any special funds for this purpose. The VDL has been able to regularly reinvest in new equipment. The VDL uses proprietary diagnostic information software to provide Web-based access to data to its clients and continues to fund further enhancements to the system.

3.3.d. Facilities for maintenance of teaching and research animals

College animal facilities are run in accordance with all Animal Welfare Act and Public Health Service regulations. All University research animal holding facilities are AAALAC-accredited and inspected yearly by the USDA. All animal activities are approved by the University Institutional Animal Use and Care Committee, which conducts biannual inspections of all University animal facilities and reviews all animal use protocols. Animal care and oversight is provided by RAR, an independent University service organization charged with the responsibilities of animal husbandry and compliance with regulatory guidelines at the University. College/RAR facilities are located in the Veterinary Science, Animal Science/Veterinary Medicine, and six other buildings on the St. Paul Campus.

Large-animal research isolation facilities, considered barely adequate for research, limit the type of research that can be conducted by College faculty. Ventilation and temperature control is inadequate for controlled research studies. The facility cannot handle solid wastes, so use of bedding materials is prohibited and hay feed is limited. While the anteroom space is good, the work areas are crowded and lack convenient sinks and other equipment. Adult horses and cows must be kept in the larger stalls located in the VMC facilities. The CVM does not have suitable facilities to conduct small animal (dog and cat) infectious disease research. Non-infectious disease research animal space is available in the teaching barn. The TMF facility, the Swine Research Farm, and the Rosemount facility are good to excellent off-site institutional research facilities.

Large animals for teaching are housed in the teaching barn, which has adequate ventilation and temperature control for agricultural animal housing. There are enough spaces to house the animals, although the tie stalls for horses and stanchion stalls for cattle are not adequate for teaching or research purposes. The restraint systems are not considered adequate, as cows must be held in their stanchions during clinical skills teaching and horse stocks are very close together in a small area. In addition, junior surgery laboratories with horses must be performed in the box stalls rather than operating rooms. The paddock and turnout areas are not sufficient when larger numbers of animals are housed in the facility. The goat barn is considered an excellent housing facility for animals.

Research facilities for rodents are considered adequate, although not plentiful, with one BSL-2 room and another room containing isolators. Facilities for maintenance of dogs and cats are spread among several rooms and are not conducive to larger studies that need a controlled environment. Space to accommodate both small animal teaching and research can be problematic during peak periods, but are managed through careful scheduling. The College needs to reconfigure the experimental surgery area so that it is in closer proximity to animal research colonies.

3.3.e. Research facilities and equipment

The College has research facilities located in all four buildings in the collegiate complex. The total research space in the College is 42,827 ASF, which includes 115 laboratories. There are 89 support rooms with a total of 11,407 ASF and 59 research offices with a total of 8,912 ASF (the "research office" designation is used if the occupant spends more than 15% time in research activities). The total research laboratory and support space is 63,146 ASF.

While total research space is generally sufficient, much of the space is outmoded and not configured well to support larger programs or collaborations. A recent analysis of the research space indicated that 12% of laboratories have been recently renovated, 41% will need to be renovated in the next five years, and another 47% will need to be renovated in the subsequent five years. A shortage of space exists in several areas, including the comparative pathology group, expansion of the genomic and oncology programs, and for small animal clinical faculty.

University and College focus on graduate education and research will require major remodeling and construction of new laboratory space. AHC College facility plans will be updated in the next year, but it is uncertain if resources will become available to fund the renovation. The College will continue to fund what it can with existing resources.

Funds for research equipment will continue to come primarily from funded research projects. Some equipment may be funded from faculty startup packages as well.

3.3.f. Administrative and faculty offices

College administrative offices are located on the fourth floor of the VMC, with the IS offices located in the VS building. The space is adequate for the administrative functions of the College, although the 2002 space study concluded that the facility does not provide a good main entrance to the College, and the current location's proximity to the small animal clinic would be better suited for a translational research facility.

The College is facing a serious shortage in faculty office space, especially in the VCS Department. The available office space in the vicinity of the Small Animal VMC is currently filled to capacity. New faculty members are being doubled up in offices, housed in poor-quality office space, or housed in areas remote from their primary work areas. As a result, shortages in office space are developing in other areas. An underutilized locker room was recently renovated into a cubicle space for interns and residents, freeing up offices for faculty.

3.3.g. Service areas for students

Graduate students are generally housed together in office space or cubicles in larger rooms. Housing for graduate students in most departments is adequate. An intermittent shortage in space occurs as student numbers fluctuate.

Locker rooms and lounges are adequate and located in close proximity to student learning activities. Student locker rooms have been renovated with new lockers, floor surfaces, lighting, and restroom fixtures. Lounges have been renovated with new floor surfaces and furniture. First-year students are assigned a study carrel in 104 AS/VM, where microscopes, books, and other instructional materials can be kept and used. Student commons areas with vending machines are located in VS and several areas in the VMC buildings. The Pomeroy Center will include a student lounge, commons area, and small food service area.

A room for student organization activities is provided near the student commons area in the old VMC. The College provides two rooms for the Veterinary Student Supply, an organization developed by

students to purchase books and necessary items for laboratory instruction courses. A room for nursing mothers is also available in this area.

Library and computer laboratory facilities and equipment are discussed in Section 5.

3.3.h Building infrastructure (air handling, vented hoods, etc.)
Air handling continues to be a challenge for the College, particularly in the two VMC buildings. HVAC systems were installed at different points as the buildings were added on to over the years, and are not well integrated. An 2002 architectural study recommended replacement of the HVAC system in the VMC. That approach is cost-prohibitive, and the College is addressing the air-balancing needs on an isolated basis with changing thermostats and fan speeds. Other College buildings have generally good air handling.

A new chilled water plant was located on the St. Paul campus in 2005, and most College buildings have been connected to the new system. The new system provides more constant temperatures during the cooling season and is more reliable and economical.

The number and quality of vented hoods is adequate. Several new hoods have been installed in the past five years as part of laboratory renovations.

3.4 Posted protocols in high-risk areas
Posted protocols are located at each high-risk area as defined by DEH&S. Principal investigators and laboratory managers are responsible for safety procedures in their laboratories. Departmental research safety officers (RSOs) conduct periodic inspections of research laboratories to determine compliance with safety and health standards and regulations. Chemical and biological hazard disposals follow University protocols, and routine certifications are conducted of biological safety cabinets and chemical exhaust hoods.

3.5 Describe current plans for improvement
The College's facilities are generally good and, in some cases, excellent. Current and long-range plans focus on existing deficiencies and several anticipated future deficiencies.

In addition to the Equine Center and Pomeroy Center, the College has several projects to improve facilities. A 3,000-square-foot BSL-3 necropsy facility is under construction and will be connected to the VDL facility. This facility will provide a safe working environment for employees and students while responding to outbreaks of highly pathogenic avian influenza and other zoonotic diseases, including West Nile virus, rabies, anthrax, mad cow disease, and more recently, bovine tuberculosis.

In the VMC, projects include the installation of a linear accelerator and MRI. Other projects include renovation of clinical laboratory areas, relocation and expansion of the oncology service, expansion of the pharmacy, and vented hoods. Longer-range plans include additional exam rooms, conference rooms, and service areas.

Research space renovations are planned for new faculty in comparative oncology and microbiology. Teaching space renovations include a wet laboratory facility for continuing education and other teaching needs. The teaching barn gutter cleaning system will be upgraded in the near future, with other improvements in electrical systems safety in stall areas.

The College has planned but not yet funded an effort to construct a BSL-2/3 animal biocontainment facility to replace the existing isolation buildings.

4 CLINICAL RESOURCES

4.1 Past five years and analyze trends for each species (category)

As illustrated in Table A, the VMC continues to have a strong clinical caseload to support clinical training. This is particularly true for companion animals. Over five years canine cases increased 13% to 34,746, feline cases decreased 4% but remained strong at 8,922. The number of hospitalized dogs and cats increase proportionately (dogs – 28%, cats – 30%) as well as the number of hospitalized days (dogs – 53%, cats – 59%).

In-house treatment of bovine cases substantially decreased 49% to 188, equine cases decreased 49% to 1197, and food and fiber cases (cattle, sheep, goats, camelid, and swine) saw a substantial increase of 644% to 268. However, there has been a substantial increase in on-farm evaluation of bovine cases provided to students at the TMF, St. Paul Dairy, Rosemount Research Farm, and senior veterinary student rotations (TMF rotations, dairy theriogenology, advanced feedlot herd health, and cow calf herd health and production). This provides a good supply of food animal-related case material that is not dependent on cases being brought into the Twin Cities. Equine case load is described further in section 4.2.

Table A. VMC patient numbers for past five years

Number of Accessions	**2002**	**2003**	**2004**	**2005**	**2006**	**% Change in Five Years**
Bovine	368	168	191	189	188	-49%
Camelid	36	53	62	107	268	644%
Canine	30656	31139	32299	34201	34746	13%
Caprine	59	99	145	170	148	151%
Equine	2347	2432	1555	1150	1197	-49%
Feline	9266	9302	9505	9655	8922	-4%
Ovine	23	34	52	81	41	78%
Porcine	17	51	44	37	37	118%
Caged Pet Birds[1,2]	75	103	88	100	70	-7%
Caged Pet Mammals	22	94	69	67	52	136%
Avian Wildlife	779	676	722	750	676	-13%
Other[3]	73	37	144	163	38	-48%
Total	**43721**	**44188**	**44876**	**46670**	**46383**	**6%**
Number Hospitalized	**2002**	**2003**	**2004**	**2005**	**2006**	**% Change in Five Years**
Bovine	146	101	113	109	115	-21%
Camelid	17	25	33	49	99	482%
Canine	5525	5092	6009	7042	7097	28%
Caprine	17	31	35	57	48	182%
Equine	1117	1131	520	553	500	-55%
Feline	1397	1281	1533	1847	1817	30%
Ovine	8	5	11	37	13	63%
Porcine	11	13	14	9	5	-55%
Caged Pet Birds[1,2]	25	47	19	19	15	-40%
Caged Pet Mammals	4	4	0	1	0	-100%
Avian Wildlife	508	69	526	526	479	-6%
Other[3]	0	0	0	49	2	
Total	**8775**	**8199**	**8813**	**10298**	**10190**	**16%**

Number of Hospital Days	2002	2003	2004	2005	2006	% Change in Five Years
Bovine	551	352	376	325	390	-29%
Camelid	54	111	130	180	482	793%
Canine	5153	7489	7732	7708	7898	53%
Caprine	93	59	46	143	143	54%
Equine	6895	3227	2262	3236	3932	-43%
Feline	1525	2355	2368	2304	2419	59%
Ovine	29	34	197	367	41	41%
Porcine	23	25	13	6	19	-17%
Caged Pet Birds[1,2]	860	1356	792	943	262	-70%
Caged Pet Mammals	4	2	0	1	0	-100%
Avian Wildlife[4]	28768	27282	26692	29820	25278	-12%
Other[3]	0	0	0	180	11	
Total	**43955**	**42292**	**40608**	**45213**	**40875**	**-7%**

[1] Includes privately owned raptors used for educational programs or falconry as well as various psittacines typically referred for endoscopy or orthopedic procedures

[2] Includes those treated at The Raptor Center

[3] Includes accessions in which species was not entered

[4] Includes raptor medical treatment and rehabilitation

Table B. Ambulatory/field service program, 2006

Animal Species	Farm (Site) Calls	Animals Examined/Treated
Bovine	50	310,000
Caprine	5	250
Equine	12 *	200
Ovine	5	250
Porcine	17	56,100
Other (Camelid)	15	500

* With the addition of the Maple Plain equine ambulatory practice, this will increase to 50-100 farms and 400-800 horses.

Table C - Herd/flock health program

	Herd/flock health programs provided within your institution (Please answer yes or no)		Herd/flock health programs provided through off-campus programs (Please answer yes or no)	
		Number of Sites		Number of Sites
Dairy	Yes	1	Yes	10-20
Beef Feedlots	Yes	1	Yes	10-20
Cow-Calf	Yes	2	Yes	5-10
Small Ruminants	No	-	Yes	5-10
Swine	Yes	4	Yes	10-20
Poultry	Yes	1	No	-
Fish	No	-	No	-
Equine	Yes	50 - 100	Yes	10-15
Other (Camelid)	No	-	Yes	15-30

4.2 Describe and analyze the adequacy of normal and clinically diseased animals (VMC hospitalized, outpatient, field service/ambulatory, and herd health) used for the DVM teaching program

The VMC has an excellent canine and feline clinical caseload adequate in volume and diversity to meet the teaching needs of our veterinary students. The VMC offers 24/7 care for animals requiring primary, secondary, and tertiary care. Students also see healthy animals in a wellness clinic as part of a general practice clinical rotation. We do not offer pet bird or small mammal rotations; but students can gain experience in these species through numerous externship opportunities in private practices and other colleges.

The food and fiber caseload has increased substantially over the past four years for inpatients, outpatients, and herd health. Clinical services have been expanded to provide advanced individual and herd health evaluation, treatment, and preventive health services.

The VMC equine caseload began to decline three to four years ago for a variety of reasons, including clinicians leaving to join competing practices; aging facilities; difficulty trailering and unloading horses; and a pricing structure that was not competitive. Strategies to enhance equine caseload include: building a new equine center with a full range of diagnostic and therapeutic options for horses with performance and reproductive problems - the equine center will be home to our research program and students will be encouraged to take part in summer research experiences; purchasing an ambulatory equine practice in Maple Plain, Minnesota to establish a referral base for our in-hospital cases; redoing pricing to include competitive batch prices; increasing client exposure through outreach and horse extension services; and continuing to recruit faculty.

4.3 Describe unique clinical educational resources or programs that enhance the educational mission

Situated in a large metropolitan area, the VMC has a large emergency caseload to draw on for clinical teaching. Students manage clinical cases at all levels of acute and chronic care in a fully staffed hospital, including emergency service and intensive care unit. Clinical services are offered in each of the disciplines recognized by the American Board of Veterinary Specialties. Students also see clinical case material in a wide spectrum of "non-traditional" specialty clinics including complementary and alternative medicine, behavior, dentistry, nutrition, and theriogenology. A curricular tracking system permits students to subscribe to additional elective rotations according to species or discipline. There are approximately 65 senior rotations for students in their final 14 months. Of those 65 rotations, 24 focus on large animal topics and case material not included in our in-hospital caseload numbers (see appendix 4-2).

Companion Animal Preceptorship Program

A preceptorship program gives students an opportunity to learn in private practice settings. First, second, and third year students visit practices in the Twin Cities region as part of their Professional Skills courses, and fourth-year students have the opportunity to elect two-week clinical rotations in practices.

Elective Small Animal Surgery Rotation

In addition to core surgery rotations during the senior year, fourth-year students have the opportunity to perform elective rotations in small animal surgery. These are primarily spay/neuter clinical rotations, but they may involve other minor procedures. The College has established relationships with several regional animal humane shelters whereby abandoned, orphaned, and other dogs and cats destined for human adoption are brought to the VMC for routine spay/neuter surgery.

Shelter Medicine Program

The College has entered into an agreement with the Animal Humane Society to develop a two-week elective rotation in shelter medicine. This rotation provides students with a perspective on an under-served population of animals. Elective rotations are scheduled to begin summer 2007.

Production Animals

The College developed an alternative method of teaching bovine medicine and surgery in a real-life setting by establishing a teaching facility on a large farm 50 miles from the Twin Cities. The TMF houses 400 dairy cows in late gestation or recently fresh. Approximately 2,500 cows in the farm system supply this facility. The TMF has dorm rooms as well as laboratory and restraint facilities where students treat and manage common dairy conditions (i.e., each day observe 6-10 calvings, perform fresh cow protocols, manage the newborn calves, and assist in a variety of routine procedures). The TMF also allows applied clinical research trials, so students may take part in our Summer Scholars program and conduct research. The strong relationship with the St. Paul Dairy barn provides a continual real-life learning environment. Students have the opportunity to learn and practice dairy medicine, surgery, reproduction, herd health, dystocia, and emergency work. They participate in evaluation, treatment, and preventive health of heifer calves from birth to six months of age.

The College has chosen not to develop a food-animal ambulatory primary care practice, but has instead developed an extensive number of senior rotations that utilize farm visits as part of the learning experience. The College has excellent access to dairy, beef, and small ruminant herds for production medicine teaching through private veterinarians, Department of Animal Science, and Agricultural Extension. The University has not had an active ambulatory practice outside of our bovine theriogenology service for more than 10 years but currently students palpating over 3,500 cases per year in local dairy herds.

4.4 If off-campus clinical instruction is used, complete Table D and describe the planning, supervision, and monitoring of students; and contracting arrangements for non-institutional based faculty. See appendix 4-3 for a listing of off-site rotations which fall within institutional oversight.

4.5 Describe the involvement and responsibilities of professional students in the health-care management of patients (and clients) in clinical programs of the College.

Senior students taking VMC rotations are involved in all aspects of patient care from admission and history-taking to physical examination, diagnostic workup, treatment, client education, and discharge. Students are exposed to the use of state-of-the-art technology in diagnosis (CT scanning, nuclear scintigraphy, ultrasound, endoscopy, laparoscopy, two-dimensional and Doppler-flow echocardiography), treatment (sophisticated orthopedic, neurosurgical, dental, and ophthalmic procedures), and medical record-keeping (UVIS). Students learn primary care concepts in an integrated health-care delivery system involving teams of specialty and general-practice veterinarians working in conjunction with veterinary technicians. Students are involved in all levels of communication with clients from initial patient contact to client education and patient discharge.

4.6 Describe how subject-matter experts and clinical resources are integrated into clinical instruction

Clinical instruction is team-oriented with faculty, residents, interns, and veterinary technicians working with students to ensure they learn clinical decision-making, discipline- related knowledge and skills, and interpersonal skills. Many of our clinical rotations are discipline-based, including anesthesia, behavior, cardiology, critical care, dentistry, dermatology, emergency/critical care, medicine, neurology, nutrition, oncology, ophthalmology, radiology, surgery, and theriogenology, but students also have the opportunity to see clinical cases in a more general context in a community-based general practice within the VMC. Clinical instruction in most of these clinical services is a mix of direct clinical observation ("show and tell"), problem-solving in formal "sit down" rounds, and service management concepts in "walk-through" rounds. Students learn surgical procedures, clinical procedures, patient care, medical record entry, and how to have client discussions. Clinical concepts in populations of animals are emphasized in a regular Grand Rounds format.

4.7 Describe the adequacy of the medical records system used for the VMC(s)

An individual record is created for each animal seen at the VMC. Each new client and patient is identified by a sequentially assigned client and patient ID number tracked by UVIS, which prints patient-identification labels for all in-VMC record identification. Medical records are filed by patient number and terminal digit. Three medical records clerks manage medical records.

To expedite the access to information, medical record data is coded and stored electronically. To date, 90% of small and large animal records are coded for 2005/2006. To increase data integrity, we use a controlled vocabulary that cross references with SNOMED codes. We are presently implementing a fully electronic medical records system scheduled to be in place by March 2007. In addition, we have implemented a digital radiography system (PACS) and have scanned 40,000 anesthesia information sheets in medical records.

4.7a Medical records, including field service and/or ambulatory and population medicine activities, must be comprehensive and maintained in an effective retrieval system to efficiently support the teaching, research, and service programs of the College.

Medical records, including the PACs system and pathology database, are available to students, faculty, residents, and interns for teaching, research, and service activities. We have access to several large database systems (VMDB, UVIS, etc) for both teaching and research. Faculty members are well-versed in using these systems and are frequently consulted nationally for their expertise. UVIS is currently used or being implemented in approximately 11 other veterinary colleges. This common application/database structure improves our ability to share and receive information. The concepts of a problem-oriented medical record (POMR) are presented to students in the professional skills curriculum.

4.8 Describe how the College has responded to increasing/decreasing clinical resources

Between 2002 and 2006, the companion animal clinical caseload increased by 9.4%. This increase can be attributed to multiple factors including increased population in the Twin Cities metropolitan area, increased pet ownership, enhanced responsiveness to veterinarians and clients, and increasingly human-animal-bonded pet owners. The VMC and departments have responded to this increase by adding clinical faculty and clinical rotations in appropriate discipline areas. The caseload increase placed significant pressure on VMC infrastructure. We are working with a consultant to enhance VMC efficiency and profitability and are making significant capital expenditures utilizing funds from the $11 million University loan.

4.9 Describe the means used to maximize the teaching value of each case across the curriculum

Clinical case material is emphasized throughout the curriculum. In the first year Physiology course, principles are reinforced with clinical case examples for each of the systems - cardiac, digestive, neural, respiratory, and muscle physiology. Problems of intermediary metabolism (e.g., diabetes mellitus, hyperadrenocorticism, and hypothyroidism) are emphasized in the first-year Biochemistry course, and a series of Clinical Skills courses are offered parallel to the basic science courses during the first two years of the veterinary curriculum.

Veterinary students enroll in the Large Animal Hospital Practicum and provide after-hours care for in-hospital and emergency cases. Students receive credit for this educational experience after they complete their shifts, present a verified list documenting completion of the activities and procedures, and present a case in Large Animal Grand Rounds. The number of shifts and complexity of diagnostic and therapeutic tasks increases as the students move through the curriculum. Senior students taking large animal hospital rotations are involved in all phases of patient care from admission and history-taking to physical examination and diagnostic workup to in-hospital case management. Regular teaching rounds give students exposure to real-life cases.

5 LIBRARY AND INFORMATION RESOURCES

5.1 Information retrieval and learning resources

Library Resources (http://www.lib.umn.edu/)
University Libraries are housed in five facilities and nine branch sites on the Minneapolis and St. Paul campuses, creating the 16th largest research library in North America. Their collection comprises more than six million print volumes, 37,000 current serial subscriptions, and significant online resources including more than 22,000 electronic journals, nearly 200,000 electronic books (including government documents), and many locally created digital image, sound, and text files.

Veterinary Medical Library (http://www.vetmed.lib.umn.edu/)
The Veterinary Medical Library is part of the Health Sciences Libraries, which also include the Bio-Medical Library and the Wangensteen Historical Library of Biology and Medicine. Together, they serve the seven professional schools and colleges that make up the AHC with a staff 14 librarians and 1 technical professional. The Veterinary Medical Library has a staff of three FTEs and a collection containing 89,000 volumes, supplemented by the Bio-Medical Library's collection of over 490,000 volumes. Combined, the Health Science Libraries maintain 1,600 current print journal subscriptions, 1,500 electronic journal subscriptions including growing backfiles of older articles, 2,300 curriculum-related and self-instructional media and computer programs, as well as a variety of full-text and bibliographic electronic databases.

The Veterinary Medical Library utilizes state-of-the-art technologies to access to print and non-print biomedical information.. Wireless Internet is available throughout the library. College personnel may request scans of articles or book chapters held by the Bio-Medical Library and have them delivered via the Internet. The library and adjacent computer laboratory have 25 public computers, providing access to the library's catalog and electronic resources. The library's collection of electronic resources provides Web access to a broad range of bibliographic databases, evidence-based health care, and aggregated resources such as PubMed/MEDLINE, Web of Science, and AnimalScience.com. The library's computer laboratory also has an audiovisual collection, VCR, and two DVD players for patron use.

The Bio-Medical Library's collection of clinical medicine and research materials is very broad-based and extensive to support the wide range of basic science, clinical medicine departments, and specialized institutes and centers. It also shares a strong collection in laboratory animal research with the Veterinary Medical Library. The University recently added $2 million in recurring funds to the libraries' budget for new acquisitions. This funding will increase our ability to purchase new materials in developing areas of interest in clinical research.

5.2 Academic credentials of the librarian

The current veterinary librarian, André Nault, started in September 2005. He has a technical health sciences degree from Dawson College, a bachelor's degree in wildlife biology from McGill University, and a master's degree in library science from the University of Rhode Island. He has worked as a wildlife research biologist with the U.S. government and has published in two peer-reviewed journals. Additionally, he has six years of experience as a veterinary practice manager and technician.

5.3 Availability of learning resources support for faculty and students, including personnel

The Veterinary Medical Library and the Health Sciences Libraries provide library instruction to fully utilize library resources and materials. Classes are often personalized to fit the needs of individual topics and/or general orientation. Recent topics have included how to conduct a proper search using PubMed and Refworks, the citation database manager. Due to its close relationship with the Bio-Medical Library, the Veterinary Medical Library is able to take advantage of staff expertise to offer faculty, staff, and

students library tutorials and training, allow it to improve and expand its Web site, and receive greater administrative support.

5.4 Current plans for improvement

As part of a larger space planning initiative by the Health Science Libraries, the physical space of the library is currently being examined for possible improvements. Proposals include a reconfiguration of the library's physical layout, new furniture, and the installation of additional electrical outlets to accommodate increased laptop usage. The Internet cabling of the library is slated for an upgrade by the beginning of 2007 to improve connection speed. New Web pages to pool information sources are constantly being developed and added to the new library Web site introduced in fall 2006. Additionally, a new digital repository being developed at the University will assist in the archiving of College publications.

6 STUDENTS

6.1 Tables A-D

A. Veterinary Medical Program

Class	Year 01-02	Year 02-03	Year 03-04	Year 04-05	Year 05-06
First-year	80	79	94	89	89
Second-year	78	77	82	93	90
Third-year	74	78	77	81	93
Fourth-year	76	75	79	79	82
# Graduated	76	75	79	79	82

The faculty unanimously voted to increase the class size from 76 to 80 in 2000 and from 80 to 90 in 2003. However, the class admitted for fall 2003 was 94 students because of a higher acceptance rate than usual and a lower incidence of deferrals. Fifty-six students are currently enrolled in the DVM/MPH dual degree program (see appendix 11-1).

B. Interns and Residents (enter each person in only one category)

Department	Interns	Residents	Resident-MS	Resident-PhD
VCS	7	25	0	0
VPM	1	9	5	2

C. Graduate Students

Academic Year	M.S.*			PhD*			***Other		
	Total	**Min	% Min	Total	**Min	% Min	Total	**Min	% Min
2006-2007	39	3	.07	58	4	.06			

* Includes students receiving degrees in departments or programs outside the school or college, but whose major advisor is a faculty member of the college or school of veterinary medicine.

** Min= minority students. For the purpose of the Comparative Data Report, the "minority" category refers only to ethnic origin. African American, Asian, Alaskan Native, Hispanic, Native American, multi-ethnic individuals, and foreign nationals are classified as minority.

*** Other = excludes DVM degree

*D. Other educational programs - c*omplete the following table describing enrollment for each of the last five years:

Year	ACTIVITIES				
	ECFVG Clinical Year *# enrolled*	Foreign Seniors *# Enrolled*	Vet Tech Program *Number enrolled*	Undergraduate Programs *# enrolled*	Other *# Enrolled*
2001-02	1	12	N/A	N/A	N/A
2002-03		13	N/A	N/A	N/A
2003-04	1	13	N/A	N/A	N/A
2004-05		24	N/A	N/A	N/A
2005-06		17	N/A	N/A	N/A

6.2 Provide a listing of student services

Registration--Each term students fill out a registration form for core courses, electives, and information on insurance and optional student fees. This form is returned to ASA where a staff member registers the students, adds insurance information if necessary, and verifies their desire to pay optional student fees. Throughout the term staff will add or cancel classes as students need. We also help them deal with issues they might have, such as billing errors and insurance payments.

Counseling--The directors and associate dean counsel and mentor students. The College also refers students to University services Disability Services tests for disabilities and notifies faculty of any special accommodation need. Boynton Health Services provides health care and also mental health service, physical therapy, immunization, ophthalmology, dental services, and other specialized services. Counseling services are provided through University Counseling and Consulting Services. A financial aid

counselor is housed in the College two days a week during the first two weeks of classes. After that, students are advised to call, e-mail, or stop by the University's Student Financial Aid Office or to visit with a OneStop counselor in the Registrar's Office.

The College has instituted a "buddy" system for first-year students. Students in the second year are paired with a new student to give advice and help in any way they can. Each class has an assigned faculty mentor to advise and refer students to the appropriate office.

Clubs and Discussion Groups--Students may participate in faculty-led special interest discussion groups, such as a dairy discussion group and swine discussion group, or in the following clubs and organizations:

Student Council
Behavior Club
Canine Club
Christian Veterinary Fellowship
Equine Club
Feline Medicine Club
Holistic Medicine Club
International Veterinary Students Association
Orphan Kitten Project
Production Animal Medicine Club
Sheep, Goat, Llama Club
Veterinary Business Management Association
Veterinary Emergency and Critical Care Society
Alpha Psi
Honor Case Commission
St. Paul Board of Colleges
Student Chapter of the AVMA
Zoo, Exotic, Avian & Wildlife Medicine Club
Pathology Club
Spanish for Veterinarians Club

6.3 Summary of College activities in support of placement of graduates

ASA has primary responsibility for placement of graduates. A resume book is published annually for distribution at the Minnesota Veterinary Convention and is made available free of charge to practices seeking new associates. The book includes a one-page profile of each of the graduating students (career interest, geographical preference, clinical rotations completed, externships, campus involvement, and other activities). Typically, 8-12 practices interview students during the convention. In addition to arranging these interviews at the convention, ASA works with practices to arrange interviews at the College with senior students who are seeking employment.

ASA maintains an online resource, Jobs Connection, for Employers seeking to hire new graduates with job openings categorized by species (small, large, equine, mixed, and other) and posted online for three months. The College offers interview, resume, and cover letter instruction in the Professional Skills course and Private Practice Preparedness rotation. Staff members review resumes and cover letters by an individual appointment basis throughout the year.

6.4 Description of testing/grading system

Currently, all clinical rotations are graded A/F except externships, directed study, and rotations at other institutions, which are graded using the S/N system. Rotation coordinators use an online system to evaluate students on knowledge, clinical skills, and professionalism. A final grade is determined by clinicians weighing the above three areas.

Didactic courses are graded A/F and S/N. Grading systems are determined by the department responsible for the course. The grading system used in each course is described in the course syllabus, which is distributed to the students on or before the first day of class. The description states whether students will be graded using a static system (A=90%, B=80%, C=70%, D=60%, F=≤ 60%) or a curve. The syllabus will also delineate the number and dates of quizzes and tests.

6.5 Academic catalog and orientation materials

The 2006-08 Catalog is online at http://www.catalogs.umn.edu/vetmed/. Orientation materials are provided in the Student Handbook, which is distributed at new student orientation and will be made available to the site team for review.

6.6 System used on an ongoing basis to collect student suggestions, comments, and complaints related to the standards for accreditation

The Standards for Accreditation are posted in the student lounges with a suggestion box for students to give feedback. Students prefer to use the end-of-year online evaluations that are disseminated each spring to provide input on the curriculum, programs, and resources.

6.7 Current plans for improvement

Many excellent student services are provided by the University, and the College complements those to meet our students' needs. We work closely with Student Council and SCAVMA to respond to student requests and have made improvements over the last several years, including on-site financial aid counseling at the beginning of each semester, extensive locker room renovations and after-hours access to the library. A major improvement is the completion of the Pomeroy Center with its state-of-the-art lecture room, seminar rooms, and commons space.

A significant change this academic year is a shift toward a leadership development focus for orientation. In 2006, the first annual Minnesota Leadership Experience (MLE) was held at Camp St. Croix during our new student orientation. The MLE was modeled after the Veterinary Leadership Experience created by Washington State University. Students, faculty, and staff spent one and a half days at the camp engaged in experiential activities led by camp facilitators. Themes included servant leadership, self-awareness, communication skills, and team building. The first-year mentor program is also undergoing some modification to support leadership development. Each mentor group has at least one faculty member who participated in the MLE. Mentors are working together to share ideas for how to best support leadership development through the mentor program. We hope to continue and even expand the MLE for the next incoming class, if funding is available.

The Clinical VMC Internship program has recently been reviewed resulting major changes, including a) increased supervision (case review, rounds) with senior clinicians on all services, particularly those scheduled during off-peak hours (e.g., emergency service); b) institution of an emergency/critical care internship to increase clinical coverage with interns during off-peak hours; c) expansion of the weekly intern seminar series to a 12-month program; d) identification of individual mentors* for each of the interns; e) expansion of the internship orientation at the beginning of the program to include leadership and professional skills training; and f) recurring professional skills training throughout the academic year.

* Faculty mentors have been asked to 1) hold regular monthly meetings with the intern to review progress, 2) problem-solve on routine medical and non-medical problems as they are experienced by the intern, 3) assist the director of the internship program in the regular performance evaluation of interns, and (4) assist in the planning of, or help identify another mentor for, an evidence-based medicine literature review or retrospective study that will serve as the basis of a Grand Rounds presentation at the end of the academic year.

7 ADMISSIONS

7.1 Minimum Requirements for Admission to the DVM Program

Potential applicants must complete the Graduate Record Examination and a specified set of courses to be considered for admission. All of the required course work must be taken at an accredited U.S. college or university and evaluated with a letter grade, unless the course is only offered pass/fail. Pre-veterinary courses must be completed with a letter grade of "C" or higher by the end of the spring semester prior to beginning the DVM program in the fall (see appendix 7-1).

7.2 Student Selection Process

The Committee on Admissions and Scholastic Standing has primary responsibility for admission of students to the DVM program (see appendix 1-5). First priority in the selection of students is given to residents of Minnesota and applicants from North Dakota, South Dakota and Manitoba, Canada. Residents of South Dakota and Manitoba, Canada are covered under reciprocity agreements, and residents of North Dakota are covered under a contract between Minnesota and North Dakota. This contract, which was first in effect for the fall 2006, allows for up to five North Dakota students to be admitted to the program. Second priority is given to all other qualified applicants. The current policy is to admit 60% of the incoming class from the resident applicant pool including applicants from reciprocity and contract agreement states/provinces.

Diversity, Summer programs, and VetFAST program - The College has participated in summer programs and programs during the academic year for students of color, including cooperative efforts with the Health Careers Center (HCC) of the AHC, the Multicultural Center for Academic Excellence and the College of Biological Sciences. These programs encourage them to consider a career in veterinary medicine. Programs hosted by the HCC include the "Scrubs, Gloves and Microscope Program" and the "Health Careers Investigations Program" both aimed at high school students of color. Each fall, the college presents to the first-term University students enrolled in the SEAM program (Student Excellence in Academics and Multiculturalism) and to freshmen enrolled in the Health Careers class coordinated by the HCC. The Life Sciences Summer Undergraduate Research Program, hosted by the College of Biological Sciences brings high ability students of color to the campus to spend time in research laboratories, including those in the College.

A working relationship has been established with the Minneapolis Health Sciences Magnet School, Roosevelt High School. Activities have included visits by college personnel and veterinary students to ninth grade career classes and VMC tours later in the year. The college has completed a comprehensive diversity plans and is seeking funds to hire a diversity program coordinator.

In an effort to attract students into food animal medicine, the College introduced the VetFAST program (Veterinary Food Animal Scholars Track) in fall 2003. VetFAST is an early decision program for high ability high school students interested in food animal medicine and planning to enter the animal science/pre-veterinary medicine program at the University. Students submit their applications to the veterinary program during their first year of college and are interviewed by the end of spring term. Students are required the complete the remainder of the pre-veterinary coursework over the next two years, maintaining a GPA of 3.4 and continuing their focus on food animal medicine. Students then enter the veterinary program in what would be their fourth year of college. The college is committed to admitting approximately three to five new VetFAST students each year and, by fall term 2008, will have admitted 16 students to the program.

7.3 Factors used as admission criteria

The College added a personal interview to the selection process beginning with the fall 2004 entering veterinary class. The "evaluation of applicants" (see appendix 7-2) is a three-stage process including 1) academic measures, 2) non-academic measures and 3) behavioral interview which objectively evaluates competencies identified as important for success in the PDI study (Lewis, RE, Klausner, JS: Nontechnical

competencies underlying career success as a veterinarian. *J. Am. Vet Med. Assoc*., 222(12): 1690-1696, 2003.). Applicants not meeting a specific score on the academic measures, as set by the Admissions Committee, will not be considered further. Applicants who are invited to campus for an interview will have their admissions decision based on stages two and three of the review process.

7.4 Table A

YEAR	STATE RESIDENTS		NON-RESIDENTS		CONTRACT STUDENTS		TOTAL	
	A/P*	O/A**	A/P	O/A	A/P	O/A	A/P	O/A
2006	174 / 54	61 / 55	712 / 36	84 / 34	30 / 54	7 / 1	916 / 90	152 / 90
2005	158 / 54	52 / 51	558 / 36	87 / 34	34 / 54	15 / 5	750 / 90	154 / 90
2004	157 / 54	59 / 55	477 / 36	63 / 33	19 / 54	9 / 2	653 / 90	131 / 90
2003	144 / 54	46 / 45	467 / 36	88 / 39	39 / 54	14 / 10	650 / 90	148 / 94
2002	159 / 60	56 / 54	492 / 20	79 / 20	23 / 60	10 / 6	676 / 80	145 / 80

* A/P = Applications/Position Available

**O/A = Offers Made/Acceptances

Note: Contract students include applicants from North Dakota, South Dakota and Manitoba, Canada. The College has not limited the number of students that might be accepted from the reciprocity agreements. These students are considered part of the resident applicant pool along with applicants from Minnesota.

7.5 Current plans for assessing the success of the selection process to meet the mission of the college

As a part of our Outcomes Assessment Plan, we are assessing the success of our admissions process based on number of measures:

1) Comparison of entering GPA between "old" (Class of 2007 and earlier) and "new" (Class of 2008 and beyond) selection processes:

Entering Fall	**2003**	**2004**	**2005**	**2006**
Class of	**2007**	**2008**	**2009**	**2010**
Overall GPA	3.60	3.55	3.63	3.53
S.D.	0.273	0.266	0.235	0.295
Range	2.95-4.00	2.90-4.00	2.84-4.00	2.86-4.00

2) Primary outcomes assessment data collected from the Competency Assessment Form (see Standard 11.3 for details)

3) Survey of applicants regarding perceptions of interview:

Percentage of applicant responses categorized by "Agree", "Neutral", and "Disagree".

Item #	Survey Question	% Agree	% Neutral	% Disagree
1	The interview focused on relevant topics.	69	12	18
2	I felt I could describe my skills and abilities during the interview.	67	13	20
3	The interview felt more like a conversation than an interview.	56	10	34
4	I have a better understanding of the program I applied for because of the interview.	27	25	48
5	The interviewers seemed prepared for me.	84	12	4
6	The questions asked by the interviewers seemed straightforward.	66	18	17
7	The interview questions were easy to understand.	73	19	17
8	I felt I had the time I needed to answer the interview questions.	86	7	7
9	The interview questions were too complicated.	12	20	67
10	I felt respected by the interviewers.	86	7	7
11	I was able to get a clear understanding of the veterinary program at Minnesota during the time I spent at the College.	72	22	6

4) Survey of faculty interviewers regarding perceptions of interview:

Percentage of interviewer responses categorized by “Agree”, “Neutral”, and “Disagree”.

Item #	Question	% Agree	% Neutral	% Disagree
1	I was able to follow the steps recommended in the interview training.	100	0	0
2	I felt prepared to conduct my interview.	100	0	0
3	The interview guide was easy to follow.	81	19	0
4	The interview training I received helped me conduct a better interview.	94	6	0
5	I felt prepared for the things I encountered in my interview	86	7	7
6	The structured questions helped me understand my candidate better.	100	0	0
7	The structured behavioral questions were easy to use.	81	13	6
8	The demands of the interview are unrealistic.	13	6	81
9	The evaluation guidelines made it easy to assess my candidate's answers.	51	38	13
10	I'll continue using this style of interviewing.	87	13	0

5) Research conducted in collaboration with the School of Social Work to compare communication skills of “old” vs. “new” students in mock scenarios with standardized clients (objective structured clinical exams)

6) NAVLE pass rate (See 11.1a for details)

7) Focus groups with employers regarding perceptions of our graduates

8 FACULTY

8.1 Table A - Loss and recruitment of faculty (both tenure track and clinical track/equivalent)

Numbers of professorial rank faculty gained and lost in 2001: 7/1/00 – 6/30/01

GAINED			LOST		
Number	**Rank**	**Area of Discipline**	**Number**	**Rank**	**Area of Discipline**
1	Instructor	Pathology	1	Assoc Prof	Pathology
1	Asst Prof	Oncology	1	Professor	Molecular Genetics
2	Asst Clinical Prof	LA Medicine	1	Professor	Avian Health

Numbers of professorial rank faculty gained and lost in 2002: 7/1/01 – 6/30/02

GAINED			LOST		
2	Asst Prof	Pathology	2	Asst Prof	Pathology
1	Professor	Food Safety	1	Professor	Food Safety
1	Professor	Microbiology	1	Professor	Metabolic/ Nutritional Diseases
1	Asst Prof	Clinical Pathology	1	Assoc Prof	Pathology/ Microbiology
			1	Assoc Prof	Avian Medicine

Number of professorial rank faculty gained and lost in 2003: 7/1/02 – 6/30/03

GAINED			LOST		
1	Assoc Prof	Anesthesiology	1	Professor	Anatomy
1	Asst Prof	Small Animal Surgery	1	Assoc Prof	Radiology
1	Asst Prof	Avian Pathology	1	Asst Prof	Neurobiology/ Neuroanatomy

Number of professorial rank faculty gained and lost in 2004: 7/1/03 – 6/30/04

GAINED			LOST		
Number	**Rank**	**Area of Discipline**	**Number**	**Rank**	**Area of Discipline**
1	Professor	Swine Health & Prod	1	Professor	LA Surgery
1	Assoc Prof	Pathology	1	Professor	Ophthalmology
1	Asst Prof	Epidemiology	1	Professor	SA Surgery
1	Asst Prof	Molecular Epi	1	Professor	Diagnostic Med
			1	Assoc Prof	Radiology
			1	Asst Prof	Genomics
			1	Asst Prof	Diagnostic Med

Number of professorial rank faculty gained and lost in 2005: 7/1/04 – 6/30/05

GAINED			LOST		
Number	**Rank**	**Area of Discipline**	**Number**	**Rank**	**Area of Discipline**
1	Professor	Internal Medicine	1	Professor	Pathobiology
1	Asst Prof	Large Animal Surgery	1	Professor	Diagnostic Medicine
1	Assoc Prof	Large Animal Theriogenology	1	Asst Clinical Prof	Cardiology
1	Assoc Prof	Epidemiology	1	Asst Clinical Prof	Oncology

Number of professorial rank faculty gained and lost in 2006: 7/1/05 – 6/30/06

GAINED			**LOST**		
Number	**Rank**	**Area of Discipline**	**Number**	**Rank**	**Area of Discipline**
1	Asst Prof	Public Health - VPM	1	Assoc Prof	LA Internal Med/ Ultrasound
1	Instructor	Pathology - VPM	1	Asst Prof	Pathology
5	Assistant Clinical Prof	1 Pathology – VPM 2 Ophthalmology – VCS 1 Radiology – VCS 1 LA Surgery - VPM	2	Instructor	Anatomy - VBS Epidemiology - VPM
1	Assoc Prof	Cardiology - VCS	1	Clinical Professor	Ophthalmology - VCS
			3	Asst Clinical Prof	1 Dog Trg/Behavior; 2 LA Surgery

Table B – Staff support for teaching and research

AREA	**FTE Clerical**	**FTE Technical**	**Other**	**TOTAL**
Clinical Teaching	2.9	11.6	35.8	50.3
Non-clinical Teaching	0.7	2.7	8.0	11.4
Research	2.0	11.1	116.1	129.2
TOTAL	**5.6**	**25.4**	**159.9**	**190.9**

Assess the strengths of the faculty and support staff in fulfilling the College mission

The majority of College faculty are engaged in scholarly activity --teaching, research, and service, and many faculty are actively engaged in clinical teaching and clinical research programs. The latter activity provides a wealth of practical, applied experience that enhances the teaching mission of the College. Additionally, this clinical (revenue-generating) activity demonstrates to the students that the faculty are teachers and active practitioners. An additional strength of our basic and clinical science faculty is their dedication to teaching and to providing quality education to the professional and graduate students. This can be seen in the number of faculty who are actively involved in the scholarship of teaching. Current faculty are participating in an Educator Development Institute, the focus of which is teaching in the health profession. Mentoring and informal seminars called Conversations in Teaching, enhance the faculty's ability to apply innovative instructional strategies to veterinary teaching and to integrate new content areas related to ethics and self-care.

CCEP has recently undertaken a systematic review of the curriculum with the aim of improving synergies in course content between basic and clinical course offerings. Many of our faculty are actively involved in continuing education programs and specialty College meetings. The clinical faculty often use these venues to improve their clinical and/or didactic teaching skills to the benefit of the students. The College emphasizes the importance of sabbatical and semester leaves in the professional development of basic science and clinical researchers, clinical educators, and clinicians.

8.2 State the current number of academic faculty (head count) who possess credentials as listed in Tables C and D.

Table C – Non-Veterinarian

Title	**M.S.**	**PhD**	**Board-Certified**	**Board- Certified & M.S.**	**Board- Certified & PhD**
Administrator	0	2	0	0	0
Professor	1	8	0	0	0
Clinical Professor	0	0	0	0	0
Associate Professor	0	6	0	0	0
Associate Clinical Professor	0	0	0	0	0
Assistant Professor	3	4	0	0	0
Assistant Clinical Professor	0	1	0	0	0
TOTAL	**4**	**21**	**0**	**0**	**0**

Table D – Veterinarian

Title	DVM (only)	M.S.	PhD	Board-Certified	Board Certified & MS	Board- Certified & PhD
Administrator	1	3	6	5	3	3
Professor	0	10	24	21	8	14
Clinical Professor	0	1	0	2	1	0
Associate Professor	0	4	9	8	2	5
Associate Clinical Professor	1	1	3	5	0	1
Assistant Professor	0	6	13	10	5	6
Assistant Clinical Professor	16	7	6	16	4	2
TOTAL	**18**	**32**	**61**	**67**	**23**	**31**

NOTE: Administrator = dean (1), associate deans (2), department chairs (3), and center directors (3)

8.3 Assess the challenges for your College in maintaining faculty numbers and quality

The major challenge in recruiting and maintaining faculty is in the clinical specialty areas (such as anesthesiology, radiology, pathology, and the biomedical sciences), where it is extremely difficult to recruit due to a small pool of highly-qualified applicants.

Recent job opportunities on the American College of Veterinary Pathologists (ACVP) Web site (http://www.acvp.org/) show 40 vacant positions for pathology positions in academic institutions and an additional 66 openings in the private sector/government. In anesthesiology, the American College of Veterinary Anesthesiologists (ACVA) reports availability of 17 faculty positions (http://www.acva.org/positions.asp). Similarly, radiologists are in high demand. Openings posted on the American College of Veterinary Radiology (ACVR) indicate 57 opportunities across both the academic and private sectors.

Compounding the difficulties in recruiting are market salaries difficult or impossible to match from those offered in the private sector. Comparative salary data, for example, show significant salary potential for board-certified veterinarians. *The Economic Report on Veterinarians and Veterinary Practices* authored by the AVMA (2005 edition) reports that, "…board-certified veterinarians earned substantially more than their non-certified counterparts. For example, in 2003 the median professional income for board-certified small animal practitioner was $137,500 compared to $77,500 for non-certified practitioners. Specialty board-certification status had a similar impact on professional incomes of public/corporate veterinarians."

Additionally, the College faces challenges regarding the level of state funding. Repeated and significant cuts have greatly impacted the ability to fund tenure-track and tenured positions, and to adequately address laboratory renovations (research space needs) and clinical equipment needs.

8.4 Provide information on the loss (what discipline/specialty) and recruitment of faculty

Please see Table A

8.5 Provide concise summary of promotion and tenure policies and the policy to assure stability for non-tenured, long-term faculty

The basis for awarding indefinite tenure is the determination that a candidate's achievements demonstrate the potential for that individual to continue to contribute significantly to the mission of the University and its teaching, research, and service programs over the course of his or her academic career. Although each department has developed its own criteria for promotion and tenure, the primary criteria used are effectiveness in teaching, professional distinction in research, and outstanding discipline-related service. Indefinite tenure may be granted at any time when the candidate has satisfied the requirements. A probationary appointment must be terminated when the candidate fails to satisfy the tenure criteria by the

last year of probationary service, and may be terminated earlier if it appears the candidate is not making satisfactory progress.

The criteria for promotion are the same as for tenure. For promotional opportunities, it is required that those put forth meet departmental expectations for each of the three responsibilities of teaching, research, and service. The stability of the non-tenured clinical faculty is equally important to the success of the College. A rigorous peer-influenced merit review process and promotional process, in addition to a full complement of excellent benefits, has helped the College assure the stability of the non-tenured faculty. For details see http://www.cvm.umn.edu/about/humanresources/Career_Development.html and http://www.ahceducation.umn.edu/OofE/Faculty/PandT/712statements.html.

8.6 Provide an estimate of the weight assigned to promotion/tenure and/or compensation for teaching, research, service, or other scholarly activities

The University policy on the relationship of teaching, research, and service to promotion and tenure is that professional distinction, research, and effectiveness in teaching are primary criteria for determining tenure or promotion. Discipline-related service, if considered outstanding and an integral part of the mission of the academic unit, may also be used as a criterion. The relative importance of the criteria may vary in different academic units, but each of the three criteria must be considered in every decision. Each academic department has a documents the criteria and standards for tenure and promotion.

8.7 Briefly describe faculty professional development opportunities available in the College/University

The University and College are committed to providing employees with professional development and training opportunities. A variety of education, training, development, and consulting programs and services is offered through the Center for Human Resource Development and the Center for Teaching and Learning. Faculty and staff may access services that enhance both their professional work and family life. For example, a number of formal professional development opportunities, such as sabbaticals and single-semester leaves, are offered. Faculty are also eligible to take leaves of absence for purposes that would increase their scholarship, expertise, or ability to carry out the mission of the College or University. This leave may be for periods as short as one or two days, or as long as two or more years (see http://www.cvm.umn.edu/about/humanresources/Career_Development.html for details).

8.8 Describe current plans or major changes in program direction that would be affected by faculty retirements, recruitment, and retention

Phased retirements are utilized in a number of situations to proactively address program impacts within the departments. Current program considerations include service commitments for disease management in zoo animals, undergraduate microbiology teaching, avian health outreach, diagnostic pathology service, and resident mentoring activities. Retirements allow the College to redirect in focused areas and allow resources to recruit and retain faculty as described in our strategic plan. The College will face challenges in the next ten years with expected retirements and workforce shortages. It will be critical for program stability to strengthen and maximize opportunities to retain our senior people longer, and have the ability to recruit a larger share of the talented younger group.

9 CURRICULUM

9.1 Curricular Objectives

The College educates veterinary students by delivering the most up-to-date scientific information, encouraging leadership, facilitating experiential learning, and using technology to enhance learning. One of the four goals in College strategic plan is to improve the health of animals and people by preparing students for successful careers. To this end, our curriculum has a number of objectives.

- The curriculum emphasizes active learning, such as computer-based tutorials (e.g., Anatomy), case-based writing assignments (e.g., Clinical Pathology), presentations (e.g., Virology), collaborative learning assignments (e.g., Virology), and objective structured clinical examinations (e.g., Professional Skills), as well as traditional hands-on laboratories (e.g. Histology).
- Emphasis is placed on concepts, principles and application in addition to memorization. Case-based discussions have been incorporated throughout the curriculum.
- Professional skills and behaviors are introduced early in the curriculum and reinforced throughout. We have implemented the Minnesota Leadership Experience (MLE) during our new student orientation. The themes introduced here are reinforced through a series of courses (Professional Skills and Clinical Skills are required courses that meet throughout the first four (PS) to six (CS) semesters) as well as through our mentor program and clinical rotations.
- Clinical experiences are introduced early in the program. Beginning in year one, students are matched with community practitioners for five half-day clinic visits. Large and Small Animal Clinical Skills courses run throughout the first five semesters, including VMC mini-rotations in year two. An overview of Animal Populations gives early exposure to the role of the veterinarian in production animal agriculture. There are also a number of elective offerings for additional early clinical exposure, including Neonatology, Clinical Skills Elective, and Large Animal Community Based Practice Mentoring.
- Subject material is integrated across courses. Faculty work together to create course schedules that integrate material across courses. We have recently begun to implement an online "curriculum map". This is a central repository for course syllabi which enhances our ability to monitor the curriculum for redundancy and omissions. We have also instituted course coordinator meetings and master scheduling meetings held for each semester of the curriculum.
- The curriculum is responsive to changes in the profession. Examples are listed in 9.2 below.
- Student mentoring is actively promoted. The freshman mentor program, created in 1997, continues and has recently taken on a new direction to support professional skill development. The Community Practitioner Preceptor Program pairs each first year student with a private practitioner for half-day clinic visits that run throughout the second semester of year one and first semester of year two. Additional mentorship opportunities have been created, including the Summer Scholars program (see 9.2 below).

9.2 Major curricular changes

There have been no major curricular changes since 1997. However, as mentioned above, curricular flexibility was one of the objectives of the curriculum. Since the curriculum was first implemented in 1997, we have made adjustments in response to student, faculty, and graduate, and employer feedback.

- We implemented a dual degree program with the School of Public Health (described in more detail under Standard 11.1.g) allowing some DVM credits to be double counted for both degrees. This was in response to the increasing demand for public health professionals. Curricular flexibility has allowed us to make necessary changes to accommodate this program and support students in completing both degrees within four-years, if they so desire.

- The Summer Scholars program was created in 2002 to offer first and second-year veterinary students opportunities for hands-on experience in biomedical research via immersion in an independent research project under supervision of a faculty mentor. Additional activities in the program demonstrate the breadth of research opportunities and careers for veterinarians as scientists or clinician/scientists in academia, industry, or government. The goal of the program is to encourage students to consider a career in academia, other research careers or more non-traditional careers.
- The track choices were revised in 2002 to better meet graduates' career goals. In particular, the Interdisciplinary Track was created to allow students with non-practice career goals to create flexibility in meeting these goals.
- A number of courses have been reorganized to allow for better course management and optimal learning. For example, the infectious agents course was split into four separate courses.
- The veterinary genetics course became a required part of the curriculum in response to changing needs of graduates and their clients' demands.
- An international disease course was added to the curriculum as a core on-line course.
- Thirteen new elective courses and over 20 new rotations have been added since 2000, including Behavior (1 core, 1 elective and 1 rotation) Integrative Medicine (1 elective and 1 rotation), Dentistry (1 rotation), and Camelid (1 rotation).

9.3 Curriculum assessment including course/instructor evaluation

Curriculum evaluation - Since 2001 we have been using an internally designed online system for administering end-of-year curriculum evaluations for the students to evaluate course sequencing, coordination among courses and access to computer resources.

Instructor evaluation - The University mandates that all instructors are evaluated using a standardized Student Evaluation of Teaching form.

Course evaluation - We believe course evaluations are also important. In the spring semester 2006, CCEP drafted a uniform set of course evaluations and we began administering them using Course Eval, an online system.

Faculty input - In addition to student feedback, we have surveyed faculty for their perceptions of specific content areas throughout the curriculum.

Curricular oversight – CCEP reviews course revisions looking for appropriate content, omissions, redundancies, appropriate sequencing. The committee is currently undergoing a comprehensive review of the curriculum as a whole.

9.4 Strengths and weaknesses of the curriculum as a whole

Curricular strengths include flexibility, early introduction of clinical exposure, dedicated courses on non-technical competencies/SKAs, a large (65+) selection of clinical rotations, high small animal caseload, creative collaborations for large animal exposure (TMF, Swine Farm), mentored research experiences (Summer Scholars), emphasis on veterinary public health (including dual degree program), and internationally-recognized teaching faculty.

Curricular weaknesses include an uneven distribution of course load over the didactic years with too little contact time in the beginning and too much toward the end, absence of a core course on clinical reasoning, and challenges with integrating basic and clinical sciences. In addition, although we have a very strong basic science program, we are working to fine tune the curriculum to achieve an optimal balance, including increasing the contact time dedicated to physiology and bacteriology.

9.5 Preceptor and externship programs (including evaluation process)
Each student is required to complete a minimum of three and a maximum of five externship experiences during clinical rotations. Students on the Interdisciplinary track may include up to fourteen externships if approved by CCEP. The College keeps an electronic list of sites students have previously chosen for externships. Students may choose a site from this list or a site that has not previously been used. Once a site is chosen, and entered into our system, a letter is sent to the individual who will be overseeing the externship. The letter confirms a particular student is coming, explains our grading and evaluation system, and provides a password and Web site which may be used to evaluate the student. Once an externship is completed the individual overseeing the student at the site is responsible for evaluating the experience and the student's abilities. This information is submitted electronically to ASA with a grade recommendation. Once submitted the evaluation is translated into a grade of satisfactory or non-satisfactory and submitted to the registrar for inclusion in the student's transcript.

9.6 Curriculum Digest – See appendix 9-1

9.7 Audit of Selected Curricular Content – See appendix 9-2

9.8 Current plans for curricular revisions
The CCEP regularly reviews curriculum and makes recommendations for improvements. Recently, a task force was formed in response to student feedback and faculty concerns to review and revise the Professional Skills courses (Y1-2). These revisions will be implemented over the next several years with the goal of better coordinating students' opportunities to develop, practice, and build professional skills throughout the curriculum. Physiology is being expanded in steps from four to six credits by spring 2008. The Host Defenses course is being reorganized with the intention of expanding clinical or case related materials, and transferring selected material to Virology, Bacteriology, Parasitology and Clinical Epidemiology courses. Pathology has also been identified as needing revision. It will likely be increased from seven to eight credits and divided into two courses taught over two semesters: a Basic Pathology and a Systemic Pathology course.

Efforts are in progress to shift courses earlier in the curriculum to more equally distribute the schedule. The curriculum had become extraordinarily full in the third year and disproportionately light in the first year. Principles of Nutrition was moved from spring to fall semester of the first year. Virology was moved from the fall of the second year to the spring of the first year. Several other courses are being evaluated for optimal positioning earlier in the curriculum.

10 RESEARCH PROGRAMS

10.1 Programs of Research Excellence

The College continues to emphasize and grow high-quality collaborative research programs and has targeted two primary areas of research emphasis, infectious disease and comparative medicine. We have invested more than $4.5 million in startup packages for new faculty over the past five years and $1.3 million in nine renovated research laboratories. The College has purchased more than $1.2 million in state-of-the-art equipment during the past six years. The growth in our research programs has provided greater opportunities for students to benefit from courses taught by faculty with active research programs.

Infectious Disease - A strategic plan has been developed for an infectious disease program with zoonotic and emerging infectious diseases as major research focused on molecular pathogenesis of viral and bacterial diseases. Areas of study include zoonotic and emerging infectious diseases with emphasis on food safety. The College leads two large USDA research projects involving Johne's disease and PRRS and distinguished itself as a leader in genomics, sequencing the genomes of many important pathogens including *Pasteurella, Lawsonia, Cryptosporidium*, MAP, *Staphylococcus aureus*, and PRRS virus.

Comparative Medicine - Muscle Disease/Equine Health Genomics - Faculty in this program have projects dedicated to the diagnosis and advancement of our understanding of muscle disorders including polysaccharide storage myopathy and glycogen branching enzyme deficiency in horses. One laboratory is mapping the loci for recurrent rhabdomyolysis in thoroughbreds and searching for specific mutations for glycogen storage disease type IV and polysaccharide storage myopathy in quarter horses. Many of these heritable disorders are homologous to those found in humans and other species, while others appear to be novel diseases found only in that species. These investigators were selected by the Morris Animal Foundation to receive the first Equine Consortium for Genetic Research. This is a $2.5 million grant to study equine genetic diseases in collaboration with institutions around the world.

Comparative Medicine - Nephrology/Urology - The College has had a major research emphasis in urology for over 30 years, five research associates, and a successful graduate program (12 PhD and five master's degrees). The Urology Group has scholarly interests in the epidemiology of urolithiasis, nutritional and medical dissolution of uroliths, lithotripsy, nutritional and medical therapy to prevent progression of renal injury, treatment of hypertension and hemodialysis, and the development of evidence-based medicine protocols for the treatment of renal failure and urinary tract infections. Current funded studies include the use of calcitriol in the management of canine and feline chronic renal failure, hemodialysis of canine chronic renal failure patients, lithotripsy of urinary bladder uroliths, and dietary management of feline chronic renal failure. The Urology Group typically has one or more clinical trials ongoing in the VMC. These research projects provide an excellent learning opportunity in academic medicine for fourth-year students, as well as interns, residents, and fellows. Funding of the Osborne Endowed Chair in Urology is nearly completion and a search will begin in 2007.

Comparative Medicine - Neuroscience / Neurobiology - The University has one of the strongest groups of pain researchers in the country, and the College has several researchers who collaborate extensively with this group. One of the current projects focuses on identifying factors secreted by tumors that cause cancer pain in animals and humans (the neurochemical and molecular basis of cancer pain). A second major research project focuses on investigating the basis for gender differences observed in certain pain syndromes. A number of pain syndromes are more common in females than males, and this project attempts to elucidate the mechanisms responsible for these sex differences. Faculty are also implanting bone marrow-derived stem cells into the spinal cord in an animal model of multiple sclerosis and in a mouse cancer pain model to determine whether the stem cells can reverse the demyelination associated with multiple sclerosis and reverse the pain associated with malignancy. Long-term regulation of pain and

opioid analgesia is another primary area of study. There is also a strong program in neuro-control of blood pressure and the cause of hypertension.

10.2 Areas of research development

*Comparative Medicine – Oncology***.** The College is developing oncology as one of its concentration areas in comparative medicine. Spontaneous tumors of dogs and cats represent excellent animal models of the human condition. Current areas of investigation include bone cancer (osteosarcoma) in large breed dogs, bladder cancer (transitional cell tumors) in high-risk dog breeds, gastric cancer in the chow dog, feline head and neck carcinogenesis, immunotherapy in canine lymphoma, mechanisms of metastasis, and basic tumor biology. The program includes three faculty members: one basic researcher and two clinical oncologists and one resident in training. An additional 1,700 square feet of renovated laboratory space has been committed to the oncology research program during the past year. An active search is underway for the Perlman Endowed Oncology Chair, and we hope to have this position filled in 2007. The Perlman Endowed Chair will be a key position in helping us to increase the visibility of our program with Cancer Center investigators throughout the AHC.

Clinical Investigation Center (CIC). The CIC, established in 1998 to promote clinical research, is managed by the Office of Veterinary Research and Graduate Programs. Its mission is to provide a network of veterinary clinical investigators and state-of-the-art facilities; to coordinate research studies and technology development/transfer for sponsors, contract customers, and regulatory agencies; and to foster the welfare of people by contributing to human and animal health care. The CIC specializes in supporting busy clinical scientists in the conduct of clinical trials and providing a single entry-point and staff support in all aspects of clinical studies, including quality assurance. We have recently developed a formal relationship with Pfizer Animal Health and have eight ongoing clinical trials. For a complete list of enrolling and ongoing clinical trials, visit http://www.cvm.umn.edu/cic/current.

10.3 Research program breadth and quality

The following table shows research faculty and their productivity. In addition to the scientific publications, faculty have published numerous book chapters, textbooks, and lay publications.

	Faculty	Faculty Involved in Research	Faculty Teaching Curriculum	Total FTE Research	Extramural Research Grants #	Extramural Research Grants $	Peer Review Publications
2006							
VBS	30	27	15	14	74	$20,585,541	201
VCS	55	23	55	11	42	$446,950	164
VPM	46	37	33	11.4	60	$4,377,216	100
2005							
VBS	30	27	16	14	78	$25,190,167	188
VCS	51	19	49	10	40	$853,900	46
VPM	42	30	36	9.6	61	$ 4,047,325	112
2004							
VBS	31	28	17	15	90	$26,423,179	150
VCS	48	19	45	9	30	$831,972	23
VPM	39	35	34	9.45	42	$ 2,992,913	148

The College's research portfolio has increased considerably since our last self study. There has been a 28% increase in research grants submitted and approximately 1% increase in research expenditures.

10.4 Impact of the research program on the professional program

Professional students have a variety of opportunities to become involved in research. Most College faculty have advanced research training and integrate research principles into their lectures, laboratories, and clinical practice. Over the past five years, 59 DVM students have participated in a mentored summer research opportunity (Summer Scholars program). Of these 59 students, three have entered the PhD program, one the master's program, one a residency program, and 13 the DVM/MPH program. This program is funded through support from Merck-Merial, a USDA Challenge Grant, the Morris Animal Foundation, and collegiate funds. At the College's annual Points of Pride Research Day, professional students who participated in the Summer Scholars program prepare poster presentations and meet with the distinguished research alumnus. Students are also exposed to research in the VMC through the Clinical Investigation Center and in rotations at the TMF and Swine Farm. In addition, students have the opportunity to work in research laboratories during the summers. Grand Rounds are structured to provide continuing education for students and faculty with the goals of improving the care delivered to patients and providing research ideas and opportunities for individual and collaborative scientific investigation.

The College has also developed a weekly Comparative Biomedical Research Seminar program. While this is primarily aimed at the graduate students, we endeavor to include speakers that will attract veterinary students. This past year we have redesigned our small- and large-animal Grand Rounds. The emphasis has been on building the scientific quality of the presentations, and we have been rewarded by excellent attendance, including our DVM students.

11 OUTCOMES ASSESSMENT

11.1 Student Outcomes – Our outcomes assessment plan, the results, and the response to those results are summarized in each section below.

11.1.a NAVLE (NBE and CCT) school score report data and passage rates over the past five years

Year	Students Taking Exam	Students Passing Exam	Average Scores
2001-2002	74	65 (88%)	507
2002-2003	73	64 (88%)	491
2003-2004	79	76 (96%)	521
2004-2005	77	65 (84%)	492
2005-2006	80	63 (79%)	466
Nov/Dec 2006*	83	78 (94%)	*

* We have not yet received the report for the Nov./Dec. 2006 test and do not yet have the average scores. We received the data we have included from the Minnesota Board of Veterinary Medicine, not NBVME.

Response – The Class of 2006 was the only year in the review period (2000-2007) in which our student NAVLE pass rate dropped below 80%. A faculty task force was assembled in summer 2006 to analyze factors contributing to the lower pass rate. This task force generated a number of recommendations for students and faculty. The student recommendations focused primarily on studying for the exam (e.g., include species outside of student's track, list of study resources, etc.). Faculty recommendations included testing recommendations (e.g., rotation of exam questions, cumulative finals) and teaching recommendations (e.g., further use of case examples, utilizing techniques to promote deep learning).

In consultation with Dr. Boyce at the NBVME, we developed a plan to gather student impressions about curricular strengths and weaknesses preparing students for the NAVLE. This information is being shared with CCEP and the faculty. We are also considering implementation of the Qualifying Examination to help us better assess student preparation in the basic sciences. Although we have not identified a single cause for the drop in pass rate in the 2005-2006 year, we feel the increased student awareness and motivation may have contributed to the increase in pass rate in the Nov./Dec. 2006 test window. Another possible factor may be the addition of the Clinical Pathology course to the curriculum for the Class of 2007. This course uses a problems approach that we believe is an important addition to a systems-based curriculum.

11.1.b Student attrition rates with reasons

Relative Class	Attrition*	Reason for Relative Attrition		Absolute Attrition**
		% Academic	% Personal	
2006	0	0	1.25%	1 / 80
2005	0	1.25%	2.50%	3 / 80
2004	0	1.25%	3.75%	4 / 80
2003	1 / 76	1.32%	2.63%	2 / 76
2002	1 / 76	1.32%	1.32%	1 / 76

* Students that are either withdrawing from the program or moving to a different (earlier) class

**Students who leave and never return

11.1.c. Employment rates of graduates (within one year of graduation)

Year of Graduation	2000*	2001	2002	2003	2004	2005
% Employed at 1 year post- graduation	100%	100%	100%	92.5%	97.6%	100%

* The data for the Class of 2000 was collected at 18 months post-graduation.

11.1.d Assessments of graduating seniors; and assessments of alumni at some post-graduation point assessing educational preparedness and employment satisfaction

Outcomes Assessment Plan: In 2002 the College began to collect data from graduates and employers in response to the AVMA Council on Education Standard 11. A survey, Professional Preparedness Questionnaire (PPQ), was developed and administered to graduates beginning with the Class of 2000 at one, three and five years post-graduation. Along with information about knowledge and professional competency, we looked at the type of employment, salary, non-technical competencies, and continuing education (CE) preferences. Each year the data is analyzed, and a detailed report with analysis of trends is compiled. (All reports are available to the COE if desired.). Employer focus groups are used to collect data from that perspective. We also use a revised version of the PPQ to survey students at the time of graduation. Each year, the Associate Dean for ASA forwards results to CCEP for its review and response.

Results and Response: The PPQ surveys graduates to confirm we are meeting veterinary graduate expectations. Our benchmark is 80% or greater of graduates expressing satisfaction. The data in the table below confirm we are meeting that goal.

Percent of respondents (graduates at one, three and five years post-graduation) who strongly agree or somewhat agree to the statement "I feel that the College prepared me well for my career":

Year of Survey	**2002**	**2003**	**2004**	**2005**	**2006**
Percentage	88	84	90	92	88

We ask graduates to rate the importance of specific discipline knowledge and practice skills in their job, in contrast to their current knowledge and skills. Prior to 2005 the information was discussed and was used to support decisions. However, it was determined there was not enough longitudinal data to be able to determine trends with any confidence. In 2005 we had the analysis from data that had been collected from the Classes of 2000, 2001 and 2002 at one and three years post-graduation. This allowed the CCEP to begin to consider trends. Using the Disparity Score concept (areas in which the graduates' perception of skill/knowledge/ability was at least two steps less than the perceived importance) we identified three areas with the greatest percentage of respondents reporting this disparity -- cardiology, ophthalmology and radiology. The CCEP decided to gather more information about these three areas to determine the possible causes of these disparities. First, faculty from the cardiology and radiology discipline areas were invited to meet with the committee to share their perceptions and determine whether the contact/credit hours devoted to their course were adequate. The faculty in both areas stated that no modifications were required at this time and raised the possibility that graduates are expecting themselves to perform at the level of a specialist.

At that time the College was undergoing a search for ophthalmology faculty so the CCEP was unable to gather a faculty perspective at that point. Second focus groups of recent graduates and employers of recent graduates were conducted. In general, employers of recent graduates felt that there was a good association between their expectations of these graduates and their abilities. They felt new graduates had an unrealistic expectations about their performance in technically complicated areas like cardiology, ophthalmology and radiology. As more experienced veterinarians, employers felt that they needed to encourage new graduates to refer ophthalmology and cardiology cases that required more expertise than a generalist can provide.

Some employers mentioned they contract with radiologists for second opinions on radiographs and, therefore, it wasn't necessary for them or their employees to be experts. Others felt that this was a skill that required time and experience to gain comfort, and new grads again had unrealistic expectations of themselves. Some of the discussion with both graduates and their employers centered around faculty who are no longer at the College. In many cases, it was felt that these individuals lacked skill in teaching. Hiring new faculty with a commitment to quality teaching has improved teaching and learning. Both new graduates and employers reported that areas that were sometimes of concern in new graduates were generally communications-related, not any of the medical, surgical or specialty areas. The committee concluded that the indirect outcomes data from the PPQ provide information that will be most useful in the context of other measures such as curriculum evaluations, course evaluations, employer focus groups and the new primary outcomes measures. The CCEP is using all of this data as they continue their current review of the curriculum.

11.1.e Assessments of employers of graduates to determine satisfaction with the graduates

Outcomes Assessment Plan - We employ a number of measures to determine employers' satisfaction with our graduates. We conduct periodic focus groups of employers, sometimes to evaluate overall satisfaction and sometimes to address specific questions we have about our graduates (for example, in response to the "disparity areas" described in 11.1.d).

Results and Response - Employers report that our graduates distinguish themselves in the following areas: technical and computer skills, medical knowledge and skills, small animal surgical skills, alternative treatment methods, interpersonal skills, communication skills, respectful and empathetic in their interaction with others, follow through with clients, adaptability, self-confidence, and work ethic. Graduates performed least effectively in non-technical skills: time management, networking, business economics, multi-tasking, and realistic expectations of working in a private practice.

In response to this feedback, the Integrative courses--a series of courses addressing non-technical competencies in the context of a case that integrated basic and clinical sciences -- was replaced by the Professional Skills courses -- with a focus on non-technical competencies. Several subjects were also added to the new course including personal and small business finance. A new elective called Private Practice Preparedness, was also created to focus on topics such as the worth as a new graduate, reading a P&L statement, and what an employer looks for in hiring a new graduate.

Other challenges that employers reported include working effectively through others, leadership skills, and professionalism. In addition to addressing those skills in the Professional Skills course, we have made dramatic changes to our new student orientation, including the implementation in 2006 of the Minnesota Leadership Experience (MLE), an off-site experience modeled after the Veterinary Leadership Experience designed by Washington State University. The MLE focuses on self-awareness, team building, communication skills, and leadership development.

11.1.f. Assessments of faculty (and other instructors, for example interns and residents) related to such subjects as adequacy of clinical resources, facilities and equipment, library and information resources, etc.; and preparedness of students entering phases of education

Faculty input is gathered via a variety of means**:**

Faculty Surveys **–** We have used a number of surveys to collect faculty input. A "State of the College – Faculty Survey" was administered annually for many years until 2004. In 2004 an Employee Opinion Survey was administered to College faculty and staff. In 2006 we administered a survey that specifically addresses educational resources. Results are reported in 11.2.c below. These data were reviewed by Faculty Council, HR, and the Dean's Cabinet. As a result, plans are underway to create a more streamlined, centralized process for reviewing and funding educational resource requests.

Library – The Veterinary Medicine Library solicits faculty input both through the electronic newsletter "CVM This Week" and by directly contacting faculty in specific disciplines. The library has also created an on-line request form on its Web site. Plans are underway to recruit departmental library liaisons.

Curriculum Review – In 2005 CCEP began a review of the curriculum. A survey was drafted and sent to all faculty, including clinical faculty, to gather input. Respondents were asked to rate the students' preparation at the beginning of each year and competence at the end of each year in various subject areas. They were also asked to comment on any obstacles to teaching in their subject areas. CCEP members then began to visit the course coordinators from each course, beginning with the first semester of the program. A report of findings was then shared with the rest of the committee. This information, plus the indirect outcomes assessment data (course, curriculum and graduate surveys), was used to make recommendations for changes in several courses (see section 9.8 for details).

11.1.g Additional assessment that might assist the college in benchmarking its educational program

Our applicant numbers have kept pace with or exceeded the percentage increase in applications nationally, despite increases in tuition.

	2002	**2003**	**2004**	**2005**	**2006**	**2007**
Resident Applicants *						
Applications Received	184	178	176	192	204	197
Offers	64	60	65	61	58	
Entering Class	61	57	57	58	57	
* Resident numbers includes reciprocity students from North Dakota, South Dakota and Manitoba, Canada						
Non-Resident Applicants						
Applications Received	492	464	477	558	712	813
Offers	76	88	56	86	83	
Entering Class	19	37	33	32	33	
Total Applications received	676	642	653	750	916**	1010***
Total Entering Class	80	94	90	90	90	
Total National Applications/VMCAS	**NA**	**4449**	**4453**	**4581**	**5194**	**5737**
** The increase in total applications for the U of MN was 22% compared to a 13% increase in national applications. *** The increase in total applications for the U of MN is 10% which mirrors the increase in national applications.						
Resident Tuition/Year	$13,632	$15,100	$17,341	$18,228	$19,418	
Non-Resident Tuition/Year	$27,264	$29,550	$32,529	$35,076	$36,855	

In 2002 we created a dual degree DVM/MPH program in collaboration with our School of Public Health. The program is designed to facilitate applications for qualifying veterinary students from an accredited College of Veterinary Medicine. The program began with three students and presently has grown to 103 students (the largest in the nation) with 12 veterinary medicine colleges represented. More details can be found in appendix 11-1

11.2 Institutional outcomes

University: University President, Dr. Robert Bruininks, established the goal for the University of becoming one of the top three public research universities in the nation. (http://www1.umn.edu/systemwide/strategic_positioning/report.html)

Academic Health Center: Goals of the Academic Health Center include: sustaining the vitality and excellence of Minnesota's health research; preparing new health professionals who are evidence-based and patient centered; and building a culture of service and accountability to Minnesota.

(http://www.ahc.umn.edu/about/cerra/strategicplan/process/home.html).

11.2a How the college evaluates progress in meeting its mission

The college has a strategic plan that has been approved by the senior vice president of health sciences (see appendix 1-1). To gain approval, the plan has to be consistent with the strategic plans of the University and Academic Health Center. Each year, the college develops a "compact" that describes yearly plans and activities. Again, the plan must be consistent with those of the University and AHC.

The Dean has an advisory board that meets twice each year and provides feedback to the Dean and college leadership. The VDL has a similar board to obtain feedback about how well it is meeting its mission. The VMC surveys both clients and referring veterinarians. This past year, the VMC conducted client and referring veterinarian focus groups.

The College benchmarks both financial and non-financial metrics with data in the AAVMC comparative data report and with other schools and colleges at the University (see appendix 11-2). The Cabinet is presently establishing a goal for each benchmark and the data will be reviewed each year by a committee who will make recommendations. If the goal is not met, the Cabinet will develop improvement strategies or refer to the appropriate committee for action.

11.2b Adequacy of resources and organizational structure to meet the educational purposes

As noted previously, the College has leveraged the VMC and VDL funds to enhance faculty numbers and the clinical teaching program. The expansion of the VMC has increased the learning opportunities for students, and, at the same time, has placed additional pressure on the clinical teaching program.

The College's inclusion in the AHC is a positive for collegiate teaching programs. College students are able to use learning resources and technology developed and used by the other health science schools. The Inter-professional Education Resource Center (IERC), a facility used for evaluating students' communication and interpersonal skills, is an example of how common learning space can be leveraged by all the health science schools. We use the IERC to conduct Objective Structured Clinical Exams (OSCEs) with standardized clients to teach and assess students' communication skills.

11.2c Describe outcomes assessed for college activities that are meaningful for the overall educational process (e.g., scholarly activity of the faculty, faculty/staff perception of teaching resources, student satisfaction w/ educational program, etc). If your program assesses other outcomes, briefly describe the results.

Please see section 10.3 for data on scholarly activity of faculty.

The following data were collected in a 2006 survey of the faculty about their perceptions of educational resources (see appendix 11-3). The percentage that Agree or Strongly Agree was:

The classroom meets my needs for teaching	74%
The teaching laboratories (including the teaching barn) meet my needs for teaching	70%
I have the supplies and equipment needed to support my needs for teaching	77%
I have access to adequate clinical resources (VMC cases, VDL accessions, farms) for teaching	82%
I have access to adequate information resources through the libraries	95%
I have access to adequate technical support for teaching	66%
I have access to adequate departmental support staff for teaching	61%
I have adequate access to faculty development regarding teaching	68%

Student Satisfaction at the time of graduation: Percentage of respondents that strongly agree or somewhat agree to the statement "I feel that the College prepared me well for my career." Our benchmark is 80% expressing satisfaction.

Class of:	**2002**	**2003**	**2004**	**2005**	**2006**
Percentage at graduation	74%	94.5%	88.4%	85.5%	83.6%
Percentage at one year post-graduation	90.4%	92.5%	90.5%	94.6%	N/A

Student satisfaction dropped below the 80 percent benchmark in 2002. However, one-year graduates consistently report satisfaction in the 90+ percent range. We intend to change the wording of this question on the senior survey to allow students to comment on their satisfaction with the educational program, rather than their conjecture about preparation for a career they have not yet started.

Alumni Satisfaction as measured by the University 2006 Alumni Study: Percentage that indicated satisfaction (a 1 or 2 on a 5 point scale)

Question	**College-wide**	**University-wide**
"Rate your level of satisfaction to how well the University prepared you to succeed in your career"	91%	89%
"Please describe your level of satisfaction with your student experience at the University"	92%	80%

11.3 Clinical competencies outcomes

Outcomes Assessment Plan – We have worked with consultants at Personnel Decisions International and the UMN Center for Teaching and Learning to develop an outcomes assessment plan for technical and non-technical (clinical) competencies. It was their recommendation that we develop a standardized competency assessment form (CAF) (see appendix 11-4) and utilize it during the clinical rotations (which are capstone experiences). Each rotation would assess student competency in three areas: knowledge, clinical skills and professionalism. A Clinical Competency Task Force was then assembled to guide this process. We conducted focus groups of faculty, led by the consultants from PDI, to determine the competencies for each of these areas. Rotation coordinators were then instructed to write learning objectives for each competency and map those to the nine clinical competencies described by the COE (see appendix 11-5). Behavioral anchors were written for each competency to guide assessment of student performance in each area. The resulting data are being reviewed by the Clinical Competency Task Force which will determine what action may be warranted. Recommendations may be made to the CCEP, clinical departments, and/or VMC to make necessary changes to lead to greater student competence in areas that may be identified. We are currently considering remediation approaches in the case of a student who does not achieve competence in all nine competencies by the end of the senior year.

Results and Response – This has been a major undertaking for both administration and faculty. Developing a "universal" set of competencies and getting faculty concurrence was a very lengthy process. We have also encountered a number of technical difficulties that caused setbacks. We chose to use Course Eval, an on-line system developed by Academic Management Systems, to deliver the Competency Assessment form because of its low cost and the AHC has chosen to adopt it. We have had to re-direct collegiate resources to create a 25 percent position to support this new system.

When we undertook the process of competency assessment in early 2004, we were hopeful we had ample time to plan and implement this system as well as collect, analyze, and respond to the data well in advance of the preparation of this self-study. However, this has proven to be a daunting task given the challenges of consensus-building, technology implementation, and change in general. Nonetheless, we believe it is important that the process we use in meeting Standard 11.3, gives us information and useful outcomes data, and not just satisfy a requirement for external reasons.

We have begun to collect the competency data from Course Eval and are in the process of identifying the percentage of students with competent performance in each of the nine competencies (but broken down into further detail because the Minnesota form evaluates as many as 23 competencies). Our students will not complete their clinical rotations until early May, but the results we have compiled to date may be found in appendix 11-6. These data has been reviewed by the Clinical Competency Task Force and CCEP. Plans are underway to confirm faculty perceptions of student competency are accurately reflected in these numbers. If they are, with over 97% of our students demonstrating competent performance, there is no evidence of a need for curricular revision to address competency. In addition to confirming the results, we are collecting input on the CAF and ideas for possible modification to accurately assess student competency.

In addition to the measures described above, we also have measures to assess quantity, and we are considering implementing additional measures. All students are required to participate in Large Animal Hospital Practicum (LAHP) and to satisfactorily perform all of the procedures during the first three years of their program. Students who track large or mixed animal are also required to take Large Animal Hospital Practicum during their clinical year (see appendix 11-7). The CCEP is currently considering the creation of a small animal counterpart to LAHP. We have recently developed a draft Student Rotation Portfolio form that could be used to require students to report by case the skills/procedures they have performed and the level of their involvement. This portfolio is being piloted in the Large Animal Surgery and Lameness rotation and is being used to document student such skills/procedures as anesthesia, pain management, emergency case care, client communication, lameness diagnostics, performance/interpretation of radiographs, and surgical skills/procedures.

University of Minnesota College of Veterinary Medicine
FY 2006-2009 Strategic Plan

The College of Veterinary Medicine contributes significantly to the University of Minnesota's goal of being in the top tier of research universities. The college is one of the nation's premier centers for the study of animal and human health and the education of veterinarians and biomedical scientists. The curriculum is anchored by state-of-the-art research programs and internationally-prominent scientists. Over the past few years, the college has complemented its food animal, companion animal and avian programs with internationally-recognized initiatives in genomics, food safety, public health, comparative medicine and infectious diseases.

The college is a national leader in the use of behavioral competencies to select students, the use of experiential education in its professional programs, the training the next generation of veterinary public health professionals and the development of innovative methods to train future dairy and swine veterinarians. The college is actively engaged with and committed to the success of its students, the veterinary profession, the food animal industry and the public policy process.

The College of Veterinary Medicine values….

- **Science and Knowledge…**the college is first and foremost about the discovery, integration and application of knowledge.
- **Teaching and Learning**…we educate undergraduate, graduate and professional students and veterinarians by delivering the most up-to-date scientific information in effective ways, by encouraging leadership, by facilitating experiential learning and by using technology to enhance the learning process.
- **Respect**…we respect and support our colleagues, and are dedicated to developing the skills, expertise and diversity of the faculty, staff and students.
- **Engagement**…we proactively develop and support partnerships with individuals and organizations that share our scientific, professional, educational and policy interests.
- **Service**...we provide service that exceeds the expectations of our customers and stakeholders
- **Accountability**…we hold ourselves to the highest ethical standards; we take responsibility for our actions in all facets of our work; we strive continuously to enhance our programs and services; we measure our effectiveness; and we report on our progress.
- **Leadership**…we lead by influencing and contributing to science, food animal agriculture, the veterinary profession, animal health and public health.

Over the next three years, the college will continue to build its national and international reputation and values by focusing on the following goals:

Goal # 1: To improve the health of animals and people by enhancing the vitality and depth of research programs

Objectives

1.1 Increase the financial, human and physical resources supporting basic and applied research in the areas of: 1) economically important food animal infectious diseases; 2) high consequence zoonotic diseases; 3) public health; and 4) spontaneous animal models of human disease.

1.2 Expand access to and use of high biosecurity laboratories and animal facilities, including design and construction of a new animal infectious disease building on the St. Paul campus.

1.3 Strengthen selected graduate programs in animal infectious diseases, public health and animal models of human disease to national prominence.

1.4 Establish AHC-level zoonotic disease and comparative biomedical research centers.

1.5 Enhance research infrastructure to help faculty and staff secure and manage large, multidisciplinary grants and to support clinical trials.
1.6 Leverage resources and advance shared research objectives by creating active research partnerships with industry and governmental agencies.
1.7 Inform federal and state policy decisions related to veterinary and biomedical research.

We will know we have succeeded when…

- Resources supporting priorities outlined in this plan have increased at least 10% from the 2004 baseline in each of the next three years, including grant funding, and funding for graduate students.
- Minnesota ranks in the top four veterinary colleges in all categories of total research expenditures.
- University of Minnesota faculty and staff have access to sufficient biosecurity laboratory and animal holding facilities.
- Veterinary graduate programs are recognized nationally and internationally.
- AHC-level centers for zoonotic disease and comparative biomedical research have been established.
- The research infrastructure has been improved; 3 new interdisciplinary grants have been obtained and clinical trials have increased by 30% from 2004 baseline.
- The College is a leader in providing scientific information and counsel in support of relevant state and federal public policy decisions.

Goal #2: To improve the health of animals and people by preparing students, graduates, faculty, and staff for successful careers

Objectives

2.1 Continue to refine the process of selecting students with attributes that predict success in the profession.
2.2 Strengthen and assess the curriculum continually.
    - Ensure that graduates entering private practice have adequate knowledge, skills, behavioral competencies (identified in PDI study), practical experience, and an awareness of the breadth of career options in veterinary medicine.
    - Expand the use of primary outcome assessments to monitor and improve the curriculum and admissions process.
    - Enhance Minnesota's preeminence in training the next generation of veterinary public health professionals, swine veterinarians and dairy veterinarians.
2.3 Expand learning opportunities for students, faculty and staff.
    - Increase the number and quality of experiential opportunities for professional students.
    - Increase the number of targeted collaborative learning opportunities within the University of Minnesota, with other colleges of veterinary medicine, and with private, public and academic organizations.
    - Take full advantage of opportunities for faculty and staff to pursue semester leaves and sabbaticals.
    - Increase the number of faculty, staff and students participating in international programs.
    - Enhance faculty, staff and student professional development programs to lead, influence and implement change.
2.4 Identify and implement new ways to reward teaching.
2.5 Create a national veterinary training center for veterinarians and increase continuing education opportunities for veterinarians wishing to change career paths.
2.6 Make investments in teaching facilities, equipment and technology to support the goals in the plan, including the completion of the Pomeroy Student-Alumni Learning Center project.
2.7 Develop and begin implementation of a plan to increase diversity of faculty, students and staff.
2.8 Inform federal and state policy decisions related to veterinary education.

We will know we have succeeded when…

- We are able to measure the success of our graduates through outcomes assessment in:
  - -The selection process
  - -Meeting the needs of the students, the profession and veterinary medicine
  - -Non-technical and technical competencies
- Expanded type and breadth of practical and collaborative experiences inside the University of Minnesota, with other universities, in industry and in the profession.
- Increased awareness of international program opportunities; increased financial support for students and faculty participation by 25% from 2004 baseline level.
- Increase the number of leadership opportunities for students and staff to increase their ability to manage change.
- Faculty believes that the value of quality teaching is recognized and rewarded.
- A national veterinary training center is established and funded.
- Facilities supporting teaching and learning, including the Pomeroy Center, are improved.
- A diversity plan has been completed; at least two targeted strategies have been implemented.
- The College is a leader in providing information and counsel in support of relevant state and federal veterinary education policy decisions.

Goal #3: To improve the health and wellbeing of animals and people by enhancing the veterinary health care delivery system

Objectives

3.1 Develop the Veterinary Medical Center (VMC) as a model for the service, efficiency and quality.
3.2 Develop and implement strategies for a new model of veterinary health care delivery and training that integrates University and community resources.
3.3 Implement the VMC strategic plan and balanced scorecard to ensure there are sufficient resources to invest in equipment, facilities and people.
3.3 Develop selected VMC centers of excellence to national prominence, such as the Equine Center.
3.4 Develop and promote the use of evidence-based medicine to standardize and improve patient outcomes throughout the delivery system.
3.5 Develop capacity as the source of expertise and scientifically valid information about animal health, food safety and zoonotic disease issues.
3.6 Integrate laboratory services between the Veterinary Diagnostics Laboratory (VDL), Minnesota Department of Health, Minnesota Department of Agriculture Board of Animal Health, USDA (FSIS, APHIS), CDC, FDA and DNR.
3.7 Continue to build a national leadership position for the Veterinary Diagnostic Laboratory in the emerging and zoonotic diseases, including the development of molecular diagnostic tests, surveillance and informatics.

We will know we have succeeded when…

- The VMC has increased revenues by 30% and productivity has increased by 3% from 2004 baseline.
- Three strategies have been implemented that integrate the University and community health care delivery systems.
- Surveys reveal a 90% overall satisfaction rate from VMC clients and veterinarians.
- Surveys reveal a 90% overall satisfaction rate for veterinarians submitting samples to the Veterinary Diagnostic Lab.
- Three VMC Centers of Excellence have been established and have received national recognition.
- The Veterinary Diagnostic Laboratory maintains its recognition as a national leader.
- Veterinary colleges, veterinarians, public policy makers, industry leaders and news media seek us out for scientifically valid information on animal health, food safety and zoonotic disease issues.

- Laboratory services have been integrated and coordinated between the VDL, Minnesota Department of Health, Minnesota Department of Agriculture Board of Animal Health, USDA (FSIS, APHIS), CDC, FDA and DNR.
- The use of evidence-based medicine has increased from 2004 baseline.

Goal 4: To improve the health and wellbeing of animals and people by positioning the college for long-term financial sustainability.

Objectives

4.1 Increase sponsored expenditures.

4.2 Increase non-state funding.

- Drive the VMC, the VDL and other business units (e.g.-The Raptor Center, Continuing Education, CAHFS) to long-term sustainable margins.
- Increase VDL revenue and diversify revenue sources.
- Increase the number of faculty with salary savings on grants or other non-State funding sources.
- Increase the average percent of College indirect cost recovery funds

4.3 Fully engage philanthropy to generate financial support for college programs and targeted centers of excellence.

- Complete the Equine capital campaign.
- Complete the Osborne-Hills Chair campaign.
- Complete the Oncology Chair campaign.
- Secure $2 million in endowed funds for additional scholarships to recognize achievement and to recruit a more diverse student population.

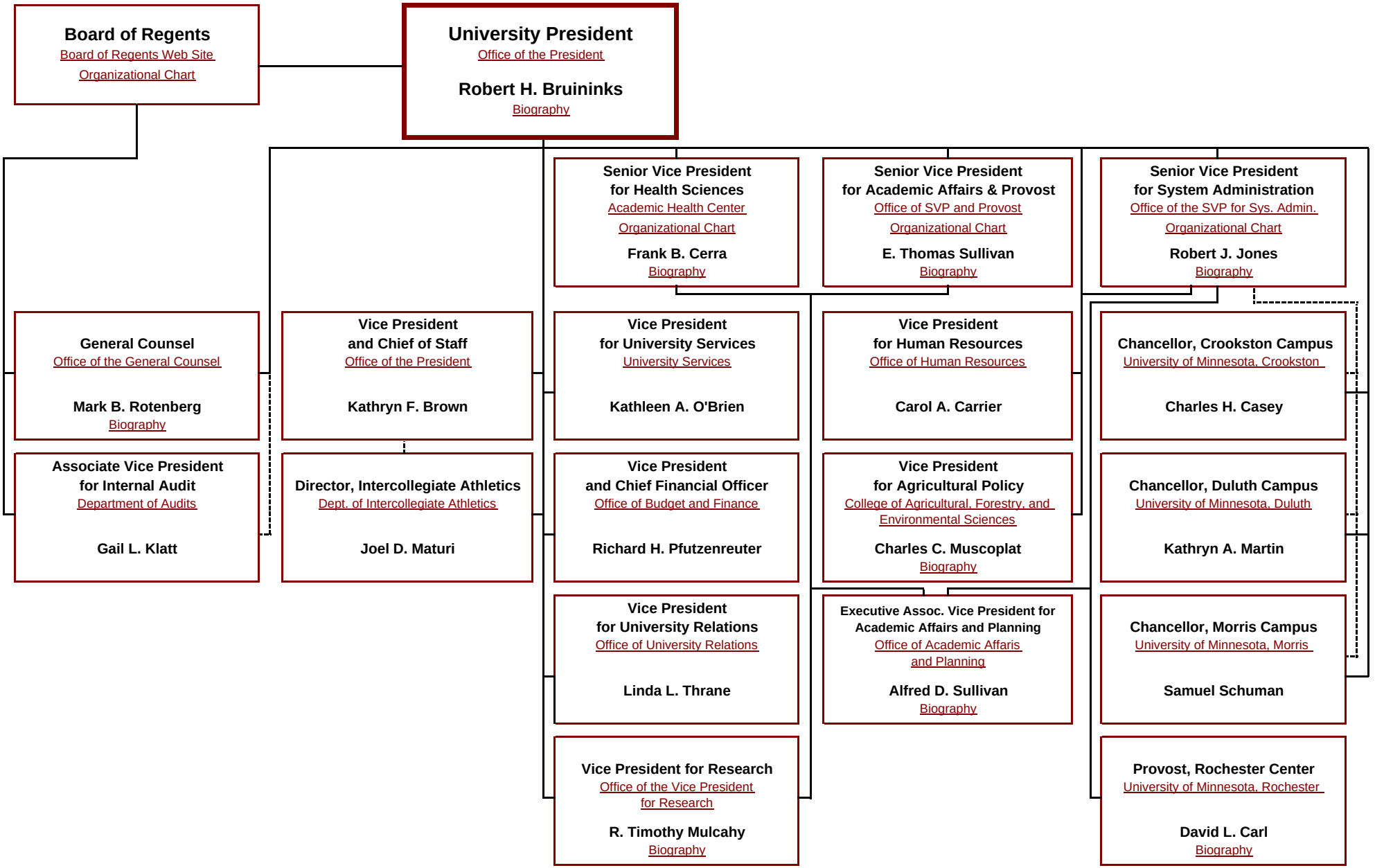
4.4 Implement tuition, admissions, and scholarship policies that maintain student access and support financial sustainability.

4.5 Evaluate programs and identify ways to enhance efficiency and effectiveness.

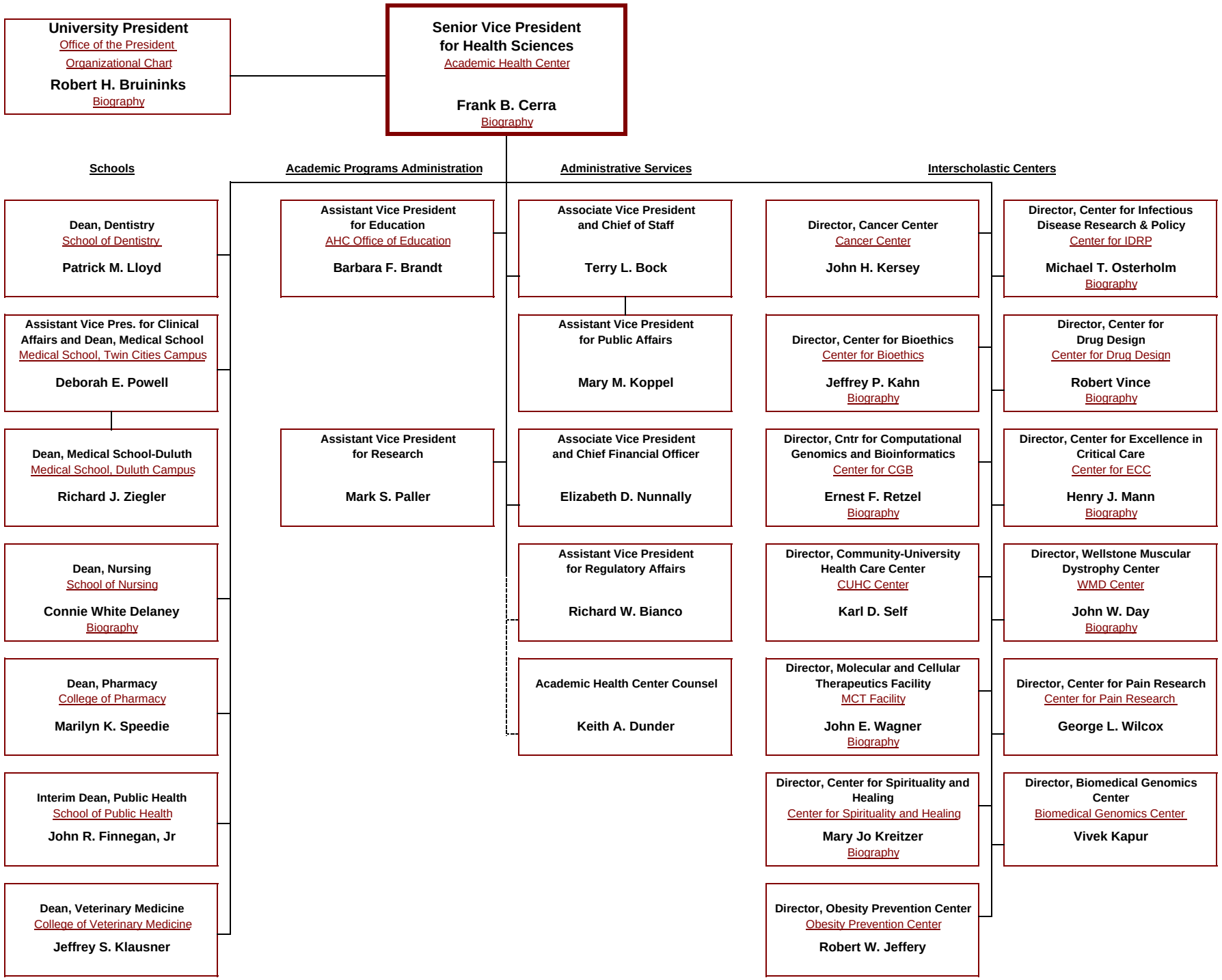
We will know we have succeeded when…

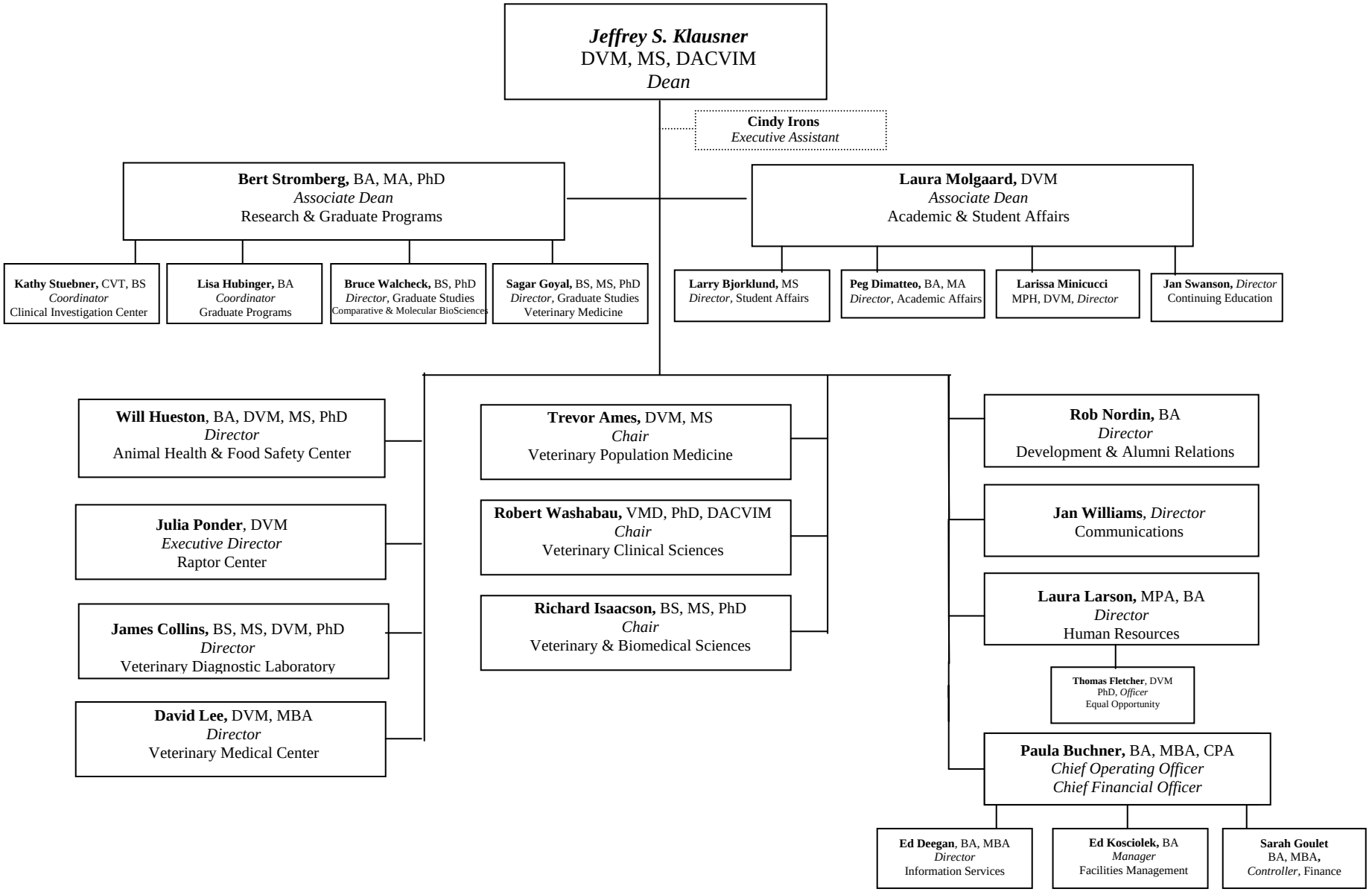
- Sponsored research expenditures have increased by at least 10% from 2004 base line.
- Non-state funds increase 5% per year from 2004 base line.
- The VMC, VDL and other business units operate with sustainable margins.
- The Equine campaign has raised $3.5 million.
- The Osborne-Hills campaign has raised $750,000.
- The Oncology Chair campaign has raised $1 million.
- 25% of veterinary students receive scholarships of at least $5,000/year.
- Tuition, admissions and scholarship policies demonstrably maintain student access and also financial sustainability.
- Number of faculty with salary savings support has increased by 25% from 2004 baseline.
- College average indirect cost recovery funds have increased from 20% to 25%.
- Programs are operating with greater efficiency and effectiveness.

University of Minnesota Organizational Chart



Health Sciences Organizational Chart
University of Minnesota




Jeffrey S. Klausner
DVM, MS, DACVIM
Dean
Cindy Irons
Executive Assistant
Bert Stromberg, BA, MA, PhD
Associate Dean
Research & Graduate Programs
Laura Molgaard, DVM
Associate Dean
Academic & Student Affairs
Kathy Stuebner, CVT, BS
Coordinator
Clinical Investigation Center
Lisa Hubinger, BA
Coordinator
Graduate Programs
Bruce Walcheck, BS, PhD
Director, Graduate Studies
Comparative & Molecular BioSciences
Sagar Goyal, BS, MS, PhD
Director, Graduate Studies
Veterinary Medicine
Larry Bjorklund, MS
Director, Student Affairs
Peg Dimatteo, BA, MA
Director, Academic Affairs
Larissa Minicucci
MPH, DVM, Director
Jan Swanson, Director
Continuing Education
Will Hueston, BA, DVM, MS, PhD
Director
Animal Health & Food Safety Center
Julia Ponder, DVM
Executive Director
Raptor Center
James Collins, BS, MS, DVM, PhD
Director
Veterinary Diagnostic Laboratory
David Lee, DVM, MBA
Director
Veterinary Medical Center
Trevor Ames, DVM, MS
Chair
Veterinary Population Medicine
Robert Washabau, VMD, PhD, DACVIM
Chair
Veterinary Clinical Sciences
Richard Isaacson, BS, MS, PhD
Chair
Veterinary & Biomedical Sciences
Rob Nordin, BA
Director
Development & Alumni Relations
Jan Williams, Director
Communications
Laura Larson, MPA, BA
Director
Human Resources
Thomas Fletcher, DVM
PhD, Officer
Equal Opportunity
Paula Buchner, BA, MBA, CPA
Chief Operating Officer
Chief Financial Officer
Ed Deegan, BA, MBA
Director
Information Services
Ed Kosciolek, BA
Manager
Facilities Management
Sarah Goulet
BA, MBA,
Controller, Finance

Committee Governance Structure

Purpose
The College of Veterinary Medicine of the University of Minnesota is dedicated to education in the art and science of veterinary medicine, the search for knowledge, academic excellence, and service to the veterinary medical profession and the people of the state. The College's constitution and bylaws provide a democratic framework which defines the roles of the faculty, students, graduate students, civil service, and administration in initiating recommendations, formulating decisions and communicating the basis for decisions to those affected. Robert's Rules of Order governs the procedures of all bodies except where inconsistent with, or inapplicable to, the Constitution or the Bylaws. Unless specified otherwise, the outcome of all elections shall be determined by simple majority of those casting ballots.

Appointed Committees

Admissions & Scholastic Standing Committee **-** The committee recommends to the faculty the criteria to select students for admittance to the DVM program and meets at the end of each academic progress term to determine what recommendations regarding the academic status of the students (including probation, suspension or dismissal of students from the professional program), the granting of advance standing to transfer applicants, and the granting of leaves from the program. The Committee is composed of twelve members including four from each of the three departments. The Dean and the Faculty Council jointly select committee members. The Associate Dean for Academic & Student Affairs, the Director of Student Affairs & Admissions, and the Director of Academic Affairs serve as ex-officio members. The Committee recommends candidates for the D.V.M. degree and the Bachelor of Science degree in Veterinary Science. The B.S.V.S. degree is granted to students at the end of the first year of the program if the student does not already hold a bachelor's degree.

Awards, Honors & Scholarship **-** The committee manages the nomination and selection process to recognize student, faculty, or staff recipients of awards, grants, and scholarships.

Committee on Curriculum & Educational Policy **-** The committee undertakes appropriate long-range studies of pre-veterinary and veterinary curriculum design, including development of goals, course content, teaching, and testing methods. They consider and decide upon changes in course titles and descriptions and consider and recommend to the faculty any additions or deletions of courses or changes in course credit. They advise the dean concerning the need for new instructional positions and annually evaluate educational outcomes of the DVM curriculum and develop mechanisms to recognize outstanding instructors who have developed innovative teaching techniques. They work with the Strategic Planning Committee on matters of curriculum related to instructional technology.

Veterinary Continuing Education **-** The committee provides faculty input into outreach activities and supports those activities to advance the college.

Student Academic Grievance Committee- The student academic grievance officer and the committee address complaints submitted as prescribed by the Board of Regents Student Academic Grievance Policy.

Ad Hoc Committees

Accreditation Committee – The committee plans and prepares the self-study report and coordinates the 4-day site visit to demonstrate that the college meets and exceeds the Council on Education standards.

Animal Use **-** The committee evaluates and encourages development of educationally meaningful, ethical uses and alternatives to animal use in the DVM curriculum, where appropriate, and to respond to faculty and student concerns about animal use and sources.

Diversity Taskforce **-** The committee developed a plan in 2006 to enhance student, faculty and staff diversity in the College consistent with plans being developed by the Academic Health Center (AHC) and

the American Association of Veterinary Medical Colleges (AAVMC). Action steps requiring limited resources include developing a diversity statement, providing increased education of search committees, promoting faculty exchange programs and marketing externships to minority students. Action steps that would require the commitment of more significant financial and/or human resources include the creation of a Diversity Recruiter position, providing increased scholarship funds and tuition waivers, and creation of new programs and expansion of existing programs to expose diverse young people to opportunities in veterinary medicine.

Government Relations **-** The committee develops legislative requests, assists in informing state and federal on initiatives, and works with the MVMA, AVMA, and AAVMC legislative affairs concerning veterinary issues, and networks with key audiences on the various activities.

International Programs **-** The committee promotes participation in international programs through student opportunities abroad, faculty exchanges, post-doctoral training abroad, and education of international scientists, and provide opportunities for international perspectives though organized seminars.

Pet Policy **-** The committee promotes a responsible work environment that allows individuals to bring pets to work under restricted circumstances as defined in its Pet Policy while ensuring that these pets do not interfere with safety or the College's mission.

Space Committee **-** All collegiate space is assigned by the Dean and is based on recommendations by the committee. Research space is assigned based on needs consistent with the strategic plan, nature of the work and investigator productivity utilizing the AHC research space formula to provide an objective means for comparing faculty within departments. Productivity includes, but is not limited to, funding level, number of laboratory personnel, history of grant submissions, and award success.

Summer Scholars Advisory **-** This program offers 15 first and second-year veterinary students the opportunities for hands-on experience in biomedical research via immersion in an independent research project under supervision of a faculty mentor to demonstrate the breadth of research opportunities and alternative careers for veterinarians as scientists or clinician/scientists in academia, industry or government. Student proposals are reviewed and approved by the committee and are ranked based on scientific merit, educational objectives, and the project's ability to provide a solid research experience.

Administrative Committees

Administrative Council **-** The Administrative Council meets at the call of the dean and serves in an advisory capacity on matters pertaining to the administration of the College. They undertake administrative functions and consider matters referred to it by the Faculty Council, other councils, department chairs, or individual faculty members.

Cabinet – The Cabinet meets weekly to strategically set direction for the college, review and implement policies, address financial and operational issues, and advance the college through its development and communication efforts.

Health & Safety **-** The committee ensures that the College remains a safe place to teach, learn, work and visit. The committee works closely with the University's Department of Environmental Health and Safety (DEHS), Police Department, Fire Department, Building Code Department and other agencies in order to remain current about health and safety issues. The committee identifies health and safety issues and takes appropriate action. Examples of specific initiatives undertaken include: chemical cleanup day, personal safety and security training seminars, CPR training sessions, respirator training, laboratory safety audits and installing safety devices in various locations (safety eyewashes, GFCI etc). Three subcommittees exist within the larger committee: research lab safety, training, and emergency preparedness. Research lab safety group conducts lab safety audits and works with the Principal Investigators to correct any audit

deficiencies. Training group identifies and establishes programs which educate and orient students and staff to safety issues and the emergency preparedness group develops processes to be used in threatening situations.

Museum **-** The Minnesota Veterinary Historical Museum was founded to record veterinary medicine. There is a vast collection of documents and veterinary memorabilia that visitors can see that the veterinary profession has changed over the last 100 years.

Elected Committees

Careers Committee **-** The committee proposes and fosters opportunities for faculty and staff development and suggests programs to encourage additional training in leadership, administration, clinical specialties, teaching techniques, or research. They also suggest mechanisms to ensure that faculty in leadership roles can continue participation in research, teaching, and service activities.

Collegiate Promotion and Tenure **-** The committee follows the procedures as outlined in the Promotion and Tenure Guidelines as stipulated by the University of Minnesota. The committee advises the dean whether members of the faculty are put forward for promotion and/or tenure meet their departmental criteria.

Faculty Council **-** The committee functions in a consultative or liaison capacity to the faculty and dean on matters of faculty concern and college policy. They generate an annual report and discuss faculty issues with the dean and the president of the University or his/her designated representative. They serve as stewards of the Constitution and Bylaws and advise the collegiate administration, faculty, and other constituencies on appropriate utilization. They recommend to the dean the names of faculty members to serve on appointed standing committees and nominate eligible faculty to serve as faculty senators in conjunction with the faculty preference survey.

Research Committee **-** The committee assists the associate dean of research to increase research opportunities by exploring novel sources of extramural funding and recommend programs to improve research competitiveness of faculty. They recommend policy for distribution of collegiate research funding and will review and make recommendation for improvements on all research facilities. The committee evaluates proposals on their scientific merit and research priorities of the college and conducts periodic reviews of funded projects. The committee selects faculty for various research awards from a nomination slate generated by the faculty.

Strategic Planning Committee **-** The committee oversees the continued development and modification of the collegiate strategic plan in areas such as future faculty positions, research priorities for the college, teaching priorities, service and outreach priorities. The committee advises the dean on long-range planning issues as they arise and formally review and revise the strategic plan at least every five years, which shall subsequently be brought to a formal faculty vote. In addition to collegiate committees, faculty and staff serve on a number of University committees.

Committee Membership

APPOINTED COMMITTEES

Admissions & Scholastic Standing ***(4-yr staggered term)***
A. Beitz, VBS, 2007
J. Sharma, VBS, 2010
T. Fletcher, VBS, 2008
D. Weiss, VBS, 2008
P. Root, VCS, 2008
R. Hardy, VCS, 2007
E. Pluhar, VCS, 2008
J. Lee, VCS, 2009 (Petra Mertens Leave)
S. Dee, VPM, 2008 *(Chair)*
M. Fahning, VPM, 2008
P. Davies, VPM, 2010
M. Trent, VPM, 2010
Ex-officio: L. Bjorklund, L. Molgaard, P. Dimatteo

Awards, Honors & Scholarship *(2-yr staggered term)*
D. Brown, VBS, 2008
J. Collister, VBS, 2007 *(Chair)*
TBD, VCS
K. Hall, VCS, 2007
M. Gramer, VPM, 2008
S. Godden, VPM, 2007
Ex-officio: L. Bjorklund, R. Nordin

Committee on Curriculum & Educational Policy *(4-yr staggered term)*
C. Ward, AS, 2010
M. Kannan, VBS, 2007
J. Mickelson, VBS, 2008
P. Root Kustritz, VCS, 2009
J. Churchill, VCS, 2008 *(Chair)*
J. Bender, VPM 2010
S. Godden, VPM, 2008
M. McCue, Graduate Student
Students: H. Damico '07, J. Norton '08, J. Hovet '09, A. Redig '10
Ex-officio: P. Dimatteo, L. Molgaard

Veterinary Continuing Education *(2-yr staggered term)*
V. Cox, VBS, 2008
M. Murtaugh, VBS, 2007
K. Hall, VCS, 2007
J. Lee, VCS, 2008
R. Davies, VPM, 2007
R. Farnsworth, VPM, 2007
Ex-officio: L. Molgaard, J. Swanson (Chair)

Student Academic Grievance Committee *(As Needed)*
Faculty
Faculty
P&A
Grad student
Grievance officer
Students: TBD
Ex-officio: L. Bjorklund

Accreditation Committee *(Ad Hoc Committee)*
T. Ames, VCS
P. Buchner, Admin
R. Isaacson, VBS
J. Klausner, Dean
L. Larson, Admin
D. Lee, VMC
L. Molgaard, Admin
A. Nault, Library
B. Stromberg, Admin
R. Washabau, VCS
J. Williams, Admin

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M. Brower, RAR
J. Armstrong, VCS *(Chair)*
C. Knutson, VCS
R. Novo, VCS
J. Wilson, VPM
Y. Ji, VBS
J. Wright, VCS
P. Mertens, VCS
B. Kramek, VCS
Students: Y. Yasis, E. Ballinger '10
T. Felske, M. Luebbers '09
A. Mellett, C. Weismantel, '08
M. Duff, J. Roycewicz '07

Diversity Taskforce *(Ad Hoc Committee)*
L. Larson, Admin *(co-chair)*
L. Molgaard, Admin *(co-chair)*
P. Dimatteo, Admin
L. Bjorklund, Admin
J. Lulich, VCS
W. Hueston, CAHFS
R. McComas, VCS
C. Hawkins, AHC
M. Carroll, Admin

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K. Choi, VCS
V. Cox, VBS
H.S. Joo, VPM
P. Mertens, VCS
M. Murtaugh, VBS
K. Nagaraja, VBS
R. Novo, VCS
P. Redig, TRC
J. Sharma, VBS
L. Wallace, VCS
J. Wilson, VPM
Students: A. Evans '08
Ex-officio: B. Stromberg, Director, (Chair)
L. Molgaard

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J. Collins, VDL
C. Riggs, U Relations
R. Isaacson, VBS
T. Iverson, U Relations
S. Kennedy, CAHFS
J. Klausner, Dean *(Chair)*
M. McDonough, AHC
B. Stromberg, Assoc Dean
R. Washabau, VCS
J. Williams, Communications

Pet Policy *(Ad Hoc Committee)*
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L. Schwartz, VBS
P. Mertens, VCS
E. LaFond, VCS
J. Ludescher, VDL
L. Mager Schedin, VMC
J. Smith, VMC
C. Malazdrewich, VPM
P. Pithua, Graduate Student
J. Myers, Graduate Student
Students: S. Goettsch '07, S. Golovyan '08, D. Fox '09, J. Hart '10
Ex-officio: Marcia Brower (RAR) (Chair)

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L. Molgaard, Admin
B. Stromberg (*chair*)
R. Isaacson, VBS
R. Washabau, VCS
J. Collins, VDL
D. Lee, VMC
T. Ames, VPM
Ex-officio: P. Buchner

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M. Abrahamsen
T. Molitor
L. Molgaard
M. Rutherford
B. Stromberg *(Chair)*

D. Lee, VBS
S. Prouty, VBS
N. Madrill, VCS
R. Joki, VDL
C. Knutson, VCS
P. Buchner, Chief Operating/Financial Officer, *(Chair)*
Ex-officio: L. Larson
B. Stromberg

Museum
J. Arnold
V. Cox
B. Hanlon
K. Johnson
W. Mackey *(Chair)*
C. Osborne (President)
J. Wright

STANDING COMMITTEES

Administrative Council
T. Ames, Chair, VPM*
P. Berzins, Director of Operations, VMC
L. Bjorklund, Director, Student Affairs
P. Buchner, Chief Operating/Financial Officer*
J. Collins, Director, VDL*
E. Deegan, Director, IS
S. Goulet, Controller, Finance
W. Hueston, Director, CAHFS*
R. Isaacson, Chair, VBS*
S. Kennedy, Assoc. Director, CAHFS*
J. Klausner, Dean *(Chair)**
E. Kosciolek, Manager, Facilities
L. Larson, Director, Human Resources*
D. Lee, Hospital Director, VMC*
L. Molgaard, Assoc Dean, Acad & Student Affairs*
R. Nordin, Director, Development*
J. Ponder, Executive Director, Raptor Center*
L. Sharkey, Chair, Faculty Council
B. Stromberg, Assoc Dean, Research & Grad Progs*
J. Swanson, Director, CE Programs
L. Valeri, Assoc. Director, CAHFS
R. Washabau, Chair, VCS*
J. Williams, Director, Communications*
*Cabinet Members

Health & Safety
E. Kosciolek, Facilities
T. Anclam, VMC
M. Brower, RAR
D. Brown, VBS
L. Bjorklund, SA
L. Arent, TRC

Class Advisor
1st yr – A. Beitz
2nd yr – C. Carlson
3rd yr – R. Hardy
4th yr – M. Fahning

Class Representatives
'10 M. Berman, M. Avriette
'09 M. Huh, J. Cho
'08 C. Igielski, M. McKie
'07 K. Griffin, M. Johnson

SCAVMA
'08 R. Reid, President
'09 I. Feldman, President Elect
'08 D. Tauer, Sr. Delegate
'06 J. Carlson, Jr. Delegate

SCAVMA Advisor
S. Dee
P. Root Kustritz

Student Council
President: M. Huh '09
Vice Pres: A. Parrish '10
Secretary: M. Berman '10
Treas: G. White '10

Student Council Advisors
L. Bjorkland
P. Dimatteo
L. Molgaard

ELECTED COMMITTEES

Careers Committee *(2-year staggered terms)*
P. Skinner, VBS (2007)
D. Brown, VBS (2008)
P. Mertens, VCS (2007)
TBD, VCS
J. Wilson, VPM (2007)
S. Goyal, VPM (2007)
Ex-officio: L. Larson
J. Lulich

Collegiate Promotion and Tenure *(2-year term)*
J. Mickelson, VBS (2008) *(Chair)*
D. Polzin, VCS (2008)
S. Valberg, VPM (2008)
L. Wallace, Faculty Council

Faculty Council (*3-year term)*
TBD, VBS
M. Rutherford, VBS (2008)
R. Singer, VBS (2007)
J. Churchill, VCS (2007)
P. Mertens, VCS (2007)
L. Wallace, VCS (2007)
J. Torrison, VPM (2009)
I. Matise, VPM (2008) (Sec)
L. Sharkey, VPM (2007) *(Chair)*
S. Godden - *at-large* (2008)
T. Fletcher – *at-large* (2007)
R. Davies - *at-large* (2009)
Alternates: V. Cox, VBS ('09)
L. Powell, VCS ('07)
TBD, VPM
Ex-officio: J. Klausner, Dean

Faculty Secretary *(2-year term)*
J. Waddell (2007)
Alternate: V. Cox (2007)

Research Committee
Tenured Faculty(3-year staggered terms)
S. Fahrenkrug, AS
M. Rutherford, VBS (2008)
K. Reed, VBS (2007) *(Chair)*
B. Walcheck, VBS (2008)
J. Lulich, VCS (2008)
TBD, VCS
L. Wallace, VCS (2007)
H. Joo, VPM (2009)
T. O'Brien, VPM (2008)
S. Goyal, VPM (2009)
Non-Tenured Faculty (1-yr term)
N. Patterson (2007)
Y. Ji (2007)
Ex-officio: Bert Stromberg

Strategic Planning Committee *(3-year term)*
M. Rutherford, VBS (2009)
L. Wallace, VCS (2007)
J. Deen, VPM (2008)
Students: I. Feldman '09
ad hoc appt'd: Cabinet
Chair: J. Klausner, Dean

University Senate Members (3-year term)
D. Fenney (2009)
R. Hardy (2008*)*
M. Trent (2007)
A. Tobias (2007)
J. Armstrong *(*2008*)*
Alternates: M. Kannan ('07)

Other Committees

AHC P&T Committee
D. Brown
AHC Faculty Development Advisory Committee
D. Brown
AHC Finance & Planning Committee
D. Feeney (Chair) (2007)
AHC Clinical Research Steering Committee
L. Pluhar
AHC Faculty Consultative Committee
D. Feeney, ex officio (2006)
P. Davies (2007)
AHC Student Consultative Committee
M. Huh (06-07)
University of Minnesota Animal Care and Use
A. Beitz
C. Carlson
T. Molitor
A. Trent
University of Minnesota Biosafety
D. Brown
University Information Technologies Committee
J. Waddell (2008)
University International Programs Committee
B. Stromberg
University Judicial Committee
A. Larson (2009)
University Retirement Subcommittee
D. Feeney, Chair
M. Murphy
University Scientific Steering Committee
K. Faaberg
University Senate Faculty Consultative Committee
D. Feeney, ex officio (2006)
University Senate Council of Academic Professionals & Administrators (CAPA) *(3-year term)*
K. Anderson (2008)
University Senate Faculty Affairs
L. Wallace (2008)
University Senate Finance & Planning Committee
D. Feeney, ex officio (2007)
University Senate Library Committee
D. Brown (2007)
University Student Academic Integrity Committee
M. Trent (2008)
University Subcommittee on TC Facilities & Support Service
E. Kosciolek
University Service Improvement Liaison Group
J. Williams

Finances

TABLE A

Total Expenditures for Immediate Past 5 Fiscal Years
Direct & Indirect Expenses

Year	Instruction	Academic Support	Student Services	Services of Educational Activity: Teaching Hospital	Services of Educational Activity: Diagnostic Lab	Services of Educational Activity: Other Amount	Services of Educational Activity: Other Type	Un-Sponsored Student Aid	Sponsored Student Aid	Sponsored Research	Other Sponsored Activity	External & Public Service	Total Direct Expenses	Total Indirect Expenses	Total Expenses
FY2002	9,143,191	3,116,005	295,073	14,043,867	4,755,073				121,100	12,757,363	1,349,185	3,911,015	49,491,872	2,651,651	52,143,523
FY2003	9,366,251	3,120,386	318,602	15,134,983	6,141,827				131,967	13,628,546	1,544,865	4,009,430	53,396,857	3,169,221	56,566,078
FY2004	10,398,455	4,382,905	321,788	15,933,875	6,830,059				168,268	12,935,697	1,765,848	3,804,853	56,541,748	3,835,909	60,377,657
FY2005	10,206,922	4,340,577	329,680	17,573,126	7,741,776				198,571	13,666,000	1,969,047	3,834,828	59,860,527	4,693,734	64,554,261
FY2006	11,549,684	4,529,566	769,295	19,376,883	8,399,759				140,615	14,047,986	1,731,351	3,827,800	64,372,939	5,583,231	69,956,170
% Change	26.3%	45.4%	160.7%	38.0%	76.6%				16.1%	10.1%	28.3%	-2.1%	30.1%	110.6%	34.2%

* without 2006 SCVAMA Symposium costs 45.5%

TABLE B

College Revenue
(Sources of Funds)
From All Sources for Immediate Past 5 Fiscal Years

Year	State Appropriations	Tuition & Fees	Is Tuition Amount Estimated?	Endowment Income (Current Yr)	Gifts for Current Use	Sponsored Program Income/ICR	Other	Sales & Services: Teaching Hospital	Sales & Services: Diagnostic Lab	Sales & Services: Other Sources	Reserves & Transfers	Total Revenue
FY2002	15,149,844	5,155,468	No	417,517	2,655,128	8,976,268	199,801	13,017,890	5,023,190	1,548,417		52,143,523
FY2003	15,904,619	5,706,725	No	505,905	2,297,803	9,768,401	172,804	14,770,923	6,674,967	763,931		56,566,078
FY2004	14,920,517	6,876,580	No	553,493	2,562,244	10,108,190	208,932	15,834,239	7,485,988	1,827,474		60,377,657
FY2005	15,465,963	8,124,010	No	627,092	2,845,968	10,844,180	28,107	15,950,440	8,440,276	2,228,225		64,554,261
FY2006	15,900,380	9,442,287	No	488,635	2,816,670	11,219,840	262,484	17,817,499	9,110,596	2,897,779		69,956,170
% Change	5.0%	83.2%		17.0%	6.1%	25.0%	31.4%	36.9%	81.4%	87.1%		34.2%

* without 2006 SCVAMA Symposium costs -1.1% 77.1%

Chart C
Professional Program Funding
Including Instruction, Student Services, Sponsored Student Aid, and VTH
(Excludes 2006 Symposium Expenditures

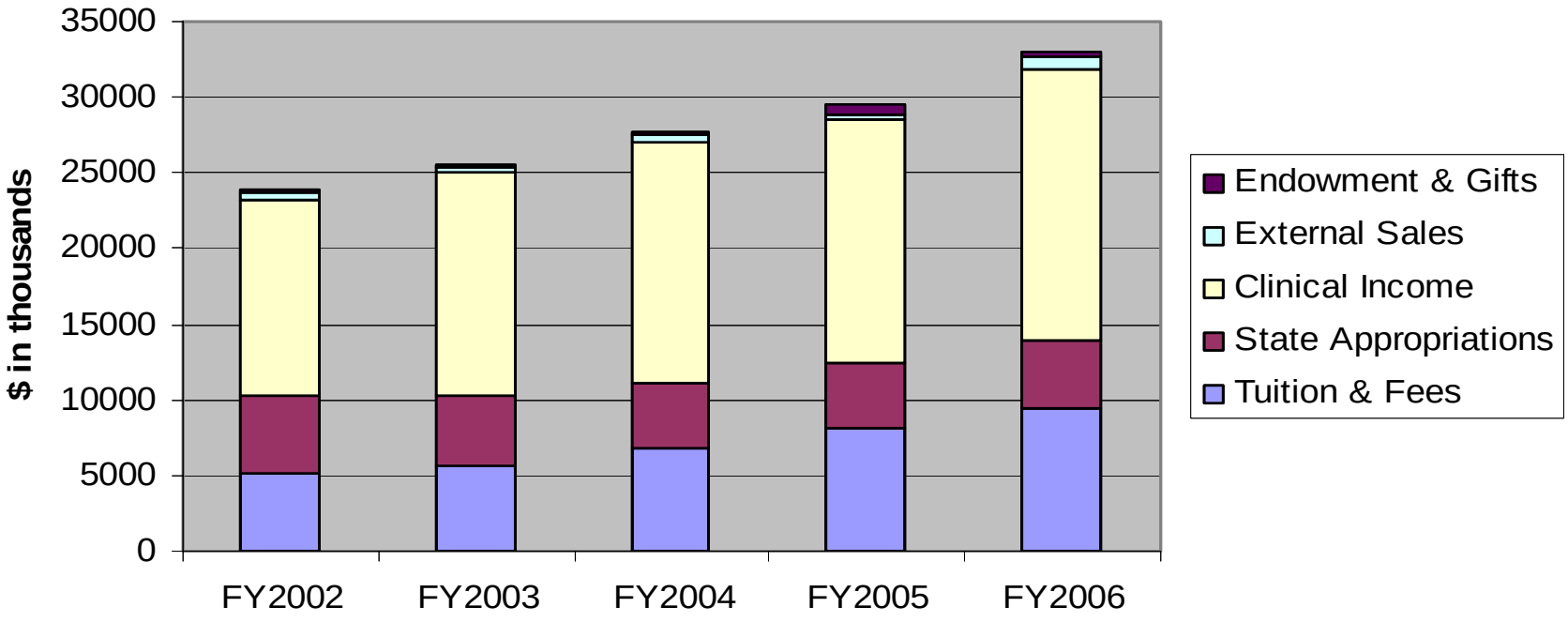
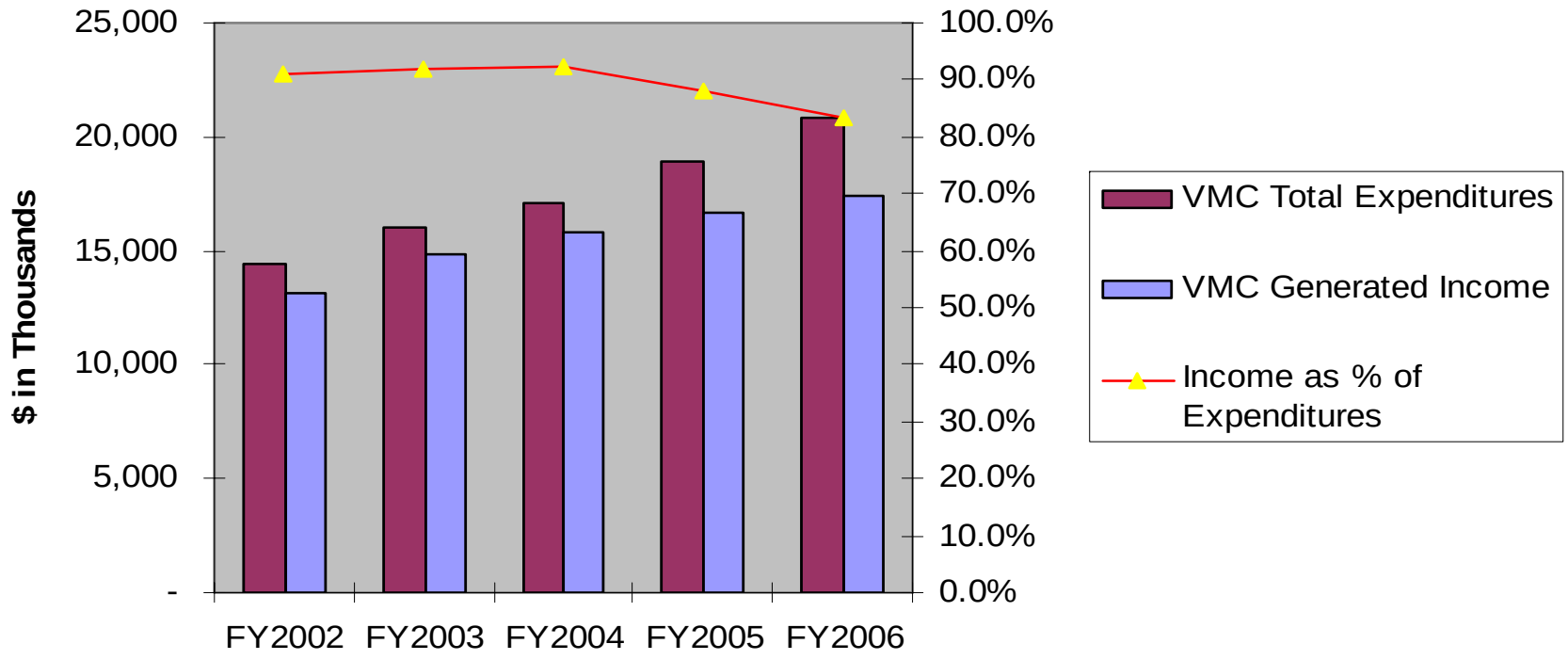
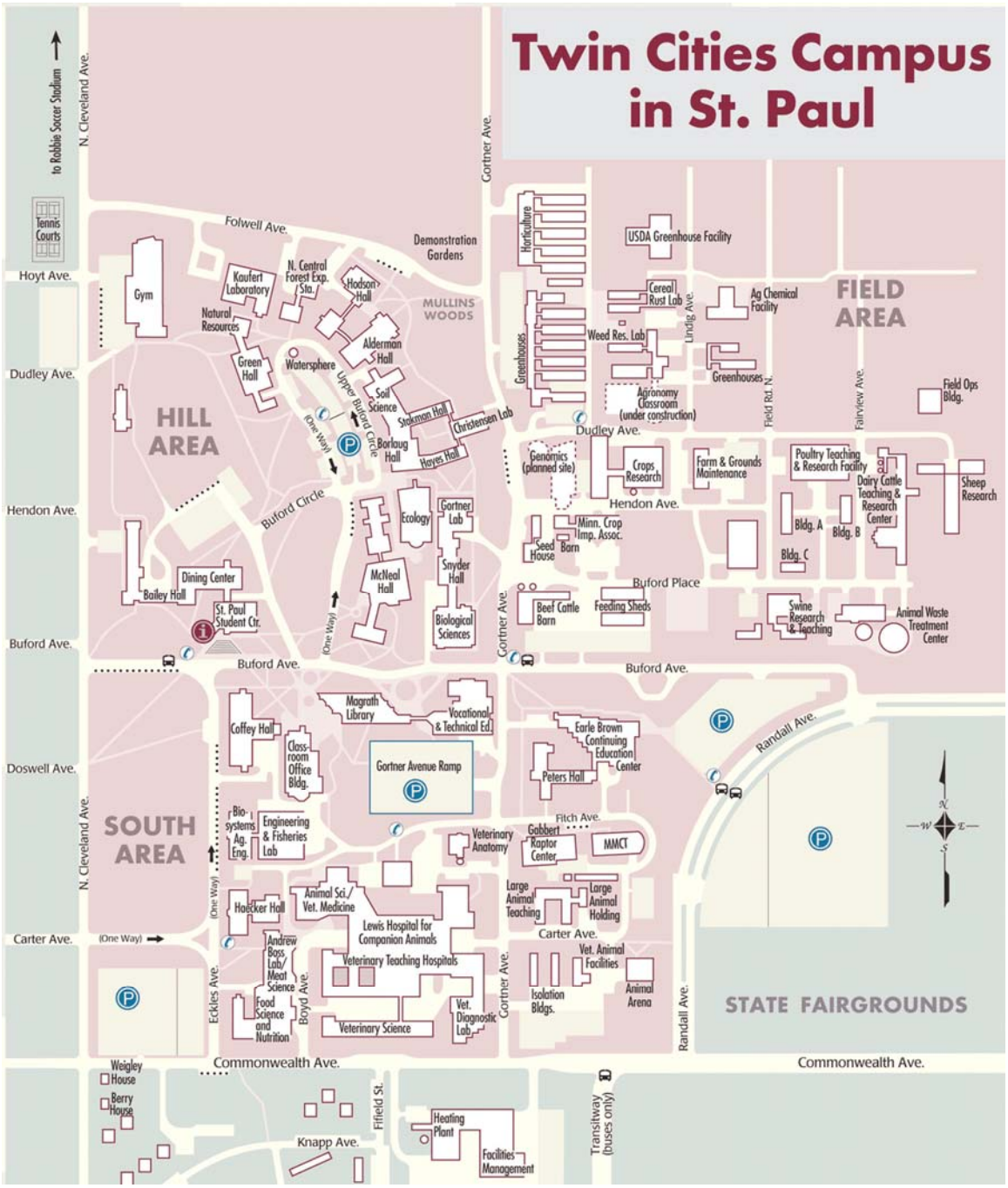


Chart D
VMC Clinical Income as a % of Expenditures
(Income excluding Tuition and State Funding; Expenditures including Faculty Compensation)



Area Map Appendix 3-1

Facility	Location	Miles	Driving Time
Transition Management Facility	Baldwin, Wisconsin	50	1 hour
Swine Research Farm	Waseca, Minnesota	82	1½ hours
Rosemount Research Farm	Rosemount, Minnesota	30	45 minutes
Maple Plain Ambulatory Practice	Maple Plain, Minnesota	30	40 minutes



Recent improvements to facilities

Classrooms/Seminar Rooms/Teaching Labs/Student Spaces

- Upgraded heating and ventilation systems in three large college lecture rooms, including new temperature and fan controllers (2002 - $15K)
- Installed new carpeting and floor supports in lecture room (2002 - $13K) and (2006 - $15)
- Retrofit installation of new HVAC system in the microbiology lab (2004-$129K)
- Increased number of workstations in first year teaching lab (2003 - $5)
- Converted 420 sq ft underutilized space into seminar room (2003 - $25)
- Renovated 3 student lounges with new furnishings (2004 - $35)
- Upgraded furnishings and media systems in 3rd year lecture room (2005 - $15)
- Upgraded HVAC and media systems in seminar room (2005 - $25)
- Renovated Dairy Barn into Pomeroy Student and Alumni Learning Center (2006/07 - $5.4M)
- Installed new AV teaching system in microbiology lab (2006 - $45)

Service Facilities

- Upgraded Pathology/Necropsy area, improved sight lines, replaced flooring (2003 - $10K)
- Converted 3 intern resident offices into 535 sq ft emergency care suite (2003 - $125K)
- Renovated 250 sq ft for endoscopy clinical and teaching service (2004 - $45K)
- Renovated 5000 sq ft for molecular diagnostic, mastitis, bacteriology service (2004 - $1.1M)
- Constructed facility, installed alkaline hydrolysis digester in VDL (2004 - $2.4M)
- Resurfaced equine ward with stainless steel custom fit panels (2004 - $18K)
- Converted underutilized space into small animal hydrotherapy suite (2005 - $5K)
- Reconfigured existing infrastructure to install digital imaging system (2005 - $12K)
- Constructing Equine Center for teaching, research, and service (2006/07 - $13.9M)
- Reconfigured dog ward for large breeds (2006 - $72K)
- Reconfigured exterior animal run used by VMC patients (2006 - $27K)
- Constructing BSL-3 necropsy lab facility (2006/07 - $2.5M)
- Constructing new facility, installing Linear Accelerator (2006/07 - $2.2M)
- Constructing new imaging center facility, installing MRI (2006/07 - $TBD)
- Reconfiguring clinical laboratory space (2006/07 - $TBD)
- Renovating space for oncology service (2007 - $TBD)
- Renovating, expanding small animal pharmacy (2007 - $TBD)

Research Laboratories

- Remodeled 584 sq ft research lab for immunology/cancer biology research (200X - $56K)
- Remodeled 710 sq ft of research lab for genomics research (2003 - $265K)
- Renovated 1000 sq ft for molecular epidemiology research (2004 - $90K)
- Renovated 1060 sq ft for molecular genetics research (2005 - $330K)
- Added 1000 sq ft from another college, converted to research space (2006 - $149K)
- Converted 450 sq ft for oncology (2006 - $45K)
- Converted underutilized locker room space for 800 sq ft gait analysis lab (2006 - $70K)

Office Environment

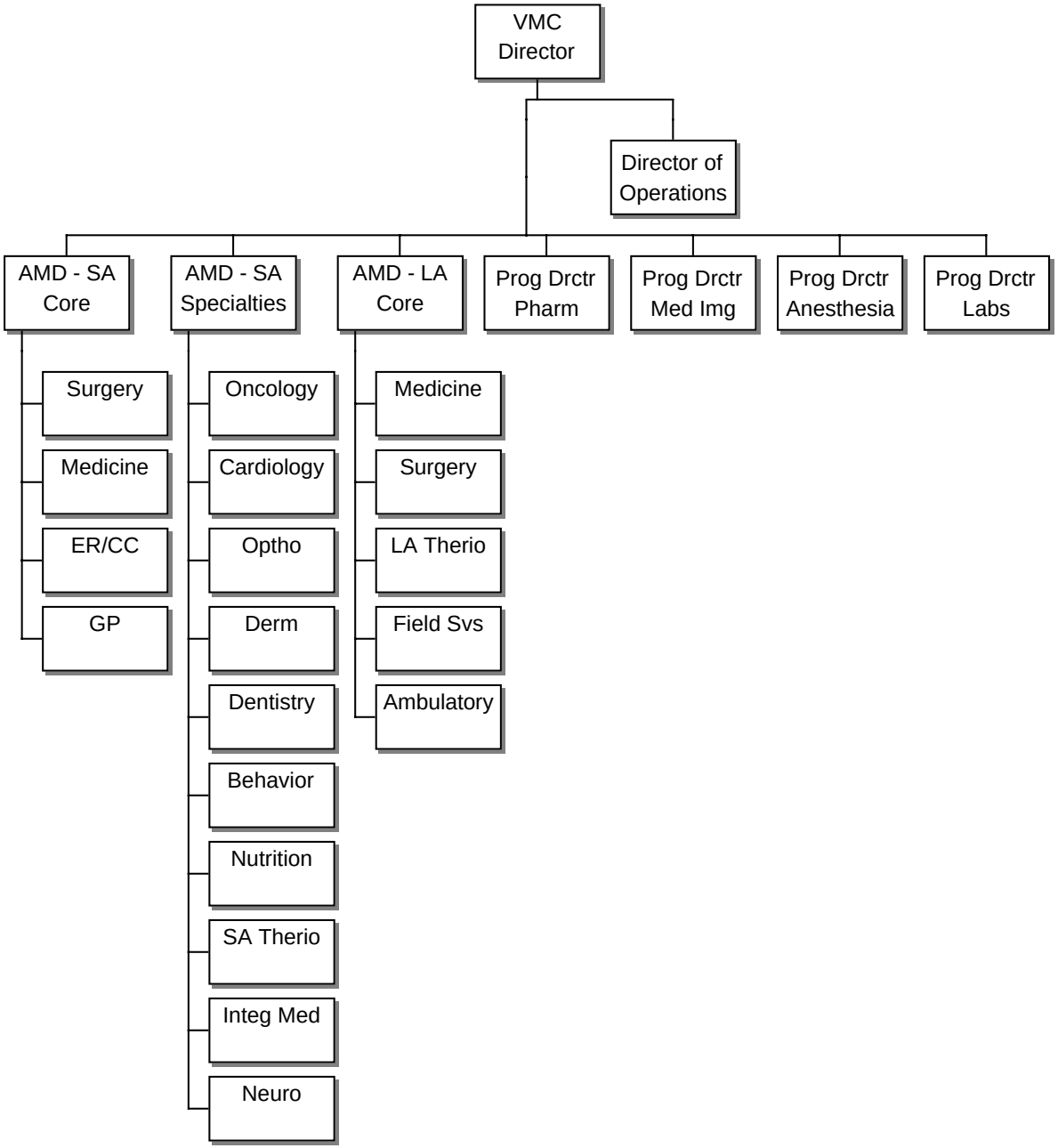
- Converted 1400 sq ft underutilized space into office area for interns/residents (2003 - $35K)
- Converted 600 sq ft of underutilized locker room space into office area for interns/residents (2006 - $75K)

2002 Minnesota Facilities Model – Results by Type of Space

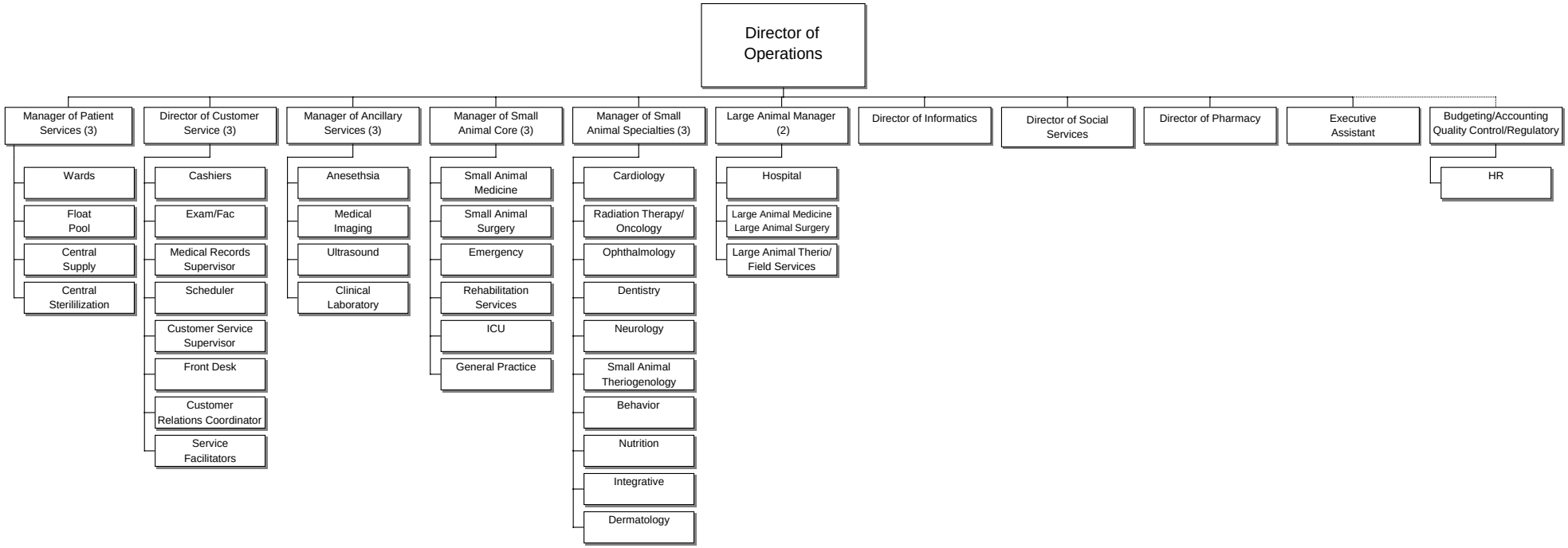
	Existing Space *	**Projected Program**	**Deviation**
Office & Support	62,410	79,639	17,229
Research	48,418	48,300	(118)
Study and Special	142,917	169,574	26,657
Dept Classroom	3,260	0	(3,260)
Instructional Lab	25,606	25,606	0
Total	**282,611**	**323,119**	**40,508**

* Note: includes 7,689 of subsequently decommissioned space in the Old Anatomy building

VMC Organization Chart



Director of Operations



Rotation Options

Comparative Services

AcPunct	Acupuncture
AdvVPH	Advanced Public Health
ComAnes	Comparative Anesthesia
FPSB	Financial Planning for the Sm Business
Labs	Laboratory Medicine
MnZM	Minnesota Zoo Medicine
Necr	Necropsy
Ophth	Ophthalmology
PrPracPr	Private Practice Preparedness - Not offered '07
PubH	Public Health
RAP	Raptor Rotation
Rad-Mix	Mixed Animal Radiology
Rad-SA	Small Animal Radiology
RegM	Regulatory Medicine
VTox	Veterinary Toxicology

Equine

EDen	Equine Dentistry
EPod	Equine Podiatry
ESpP	Advanced Equine Sports Medicine
EThA	Advanced Equine Theriogenology
EThI	Equine Theriogenology Introduction
LAUS	Large Animal Ultrasound

Food Animal

ABld	Advanced Building
AdDPM&N	Advanced Dairy Prod Med & Nutrition
BioSPlt	Biosecurity in the Poultry Industry
BoSr	Bovine Surgery
CCHP	Cow Calf Herd Production
Camelid	Camelid
DPM 1	Dairy Production Management 1
DPM 2	Dairy Production Management 2
DPM 3	Dairy Production Management 3
DPM 4	Dairy Production Management 4
DPMDS	Dairy Production Mgt Directed Study
DThP	Dairy Theriogenology Palpation
DairyHH	Dairy Diseases: Herd Health
E & B	Epidemiology and Biostatistics
FADD	Food Animal Disease and Diagnostics
Feedlot	Feedlot
SDxT	Swine Disease
SPdn	Swine Production - Not Offered
SmRu	Small Ruminants
SwHPAdv	Advanced Swine Health and Production
SWHPI	Intro to Swine Health & Production
SwPPDxT	Swine Pop Diagnostics & Therapeutics
TMF	Transition Management Facility

Large Animal

LAM	Large Animal Medicine
LASxL	Large Animal Surgery and Lameness

Other

DiStB	Directed Studies Pathobiology
DiStD	Directed Studies Diagnostic Medicine
DiStL	Directed Studies Large Animal
DiStS	Directed Studies Small Animal
ExRotPub	External Rotation in Public Health
ExtPHP	Externship Public Health Practice
Extern	Externship
LOA	Leave of Absence
MPH Proj	Master of Public Health Project
Orient	Orientation to Clinics
PubPol	Public Policy
RAOI-Ane	Rotation Other Instit– Anesthesiology
RAOI-Der	Rotation at Other Instit – Dermatology
RAOI-EqM	Rotation at Other Instit – Equine Med
RAOI-Rad	Rotation at Other Instit – Radiology
RAOI	Rotation at Other Institution
Vac	Vacation

Small Animal

Beha	Behavior
Card	Cardiology
ComB	Companion Bird
CrtC	Critical Care
Derm	Dermatology
ESAS	Elective Small Animal Surgery
Emer	Emergency
GenP	General Practice
NERU	Neurology
Nutr	Nutrition
ONC	Oncology
SAM-A	Small Animal Medicine – A
SAM-B	Small Animal Medicine – B
SARehab	Small Animal Rehabilitation
SAS	Small Animal Surgery
SATh	Small Animal Theringology
SAUS	Small Animal Ultrasound
SDen	Small Animal Dentistry

Off-campus clinical instruction

Advanced Building Design - students visit a number of area farms to evaluate facilities

Advanced Feedlot Herd Health - students visit approximately 15 feedlots in Minnesota and spend one week at the Feedlot Health Management Services in Alberta, Canada as part of a formal educational program funded by the government of Alberta; students evaluate 3,000-50,000 steers/heifers per farm

Biosecurity in the Poultry Industry - students visit a number of area farms

Bovine Surgery - students do a number of surgical procedures on teaching animals and spend 2 days doing surgical procedures on cattle in local farms; students also visit local zoo where they see about 50-55 animals

Camelid – students visit 15-30 camelid farms in the metro area and perform routine health procedures on approximately 400-900 camelids

Cow Calf Herd Health and Production - students spend 2 weeks calving out 200-300 head of cattle at the U of M Grand Rapids Experiment Station, they also visit about 3-4 area beef herds (100-600 cattle/farm) and do procedures such as vaccinating, deworming, TB testing or breeding soundness exams

Dairy Diseases: Prevention, Treatment, and Food Safety - students visit 2 herds and evaluate/observe approximately 350 cows/herd

Dairy Production Medicine: Introduction – students visit 2 herds and see approximately 2,000 animals

Dairy Production Medicine 1: Mastitis and Economics - students visit 6 herds and see approximately 4,600 cows

Dairy Production Medicine 2: Nutrition and Cow Management - students visit 3 dairies and evaluate the housing, nutrition, comfort, and management of approximately 1,800 animals

Dairy Production Medicine 3: Theriogenology and Youngstock Management students visit 2 farms and evaluate about 50-60 insemination procedures per farm; students also evaluate the reproductive herd record for 10-12 herds

Dairy Therio Palpation - visit a number of area farms and evaluate approximately 4,100 animals

Epidemiology and Biostatistics - students visit a number of area farms

Equine Dentistry - work on teeth of horses in area stables (each student works 10-20 horses) in addition to hospital cases. Visit 3-4 farms and evaluate 9-15 horses/farm

Equine Podiatry - students trim feet of teaching horses, plus ride along with local farriers and see clients with them

Equine Sports and Preventive Medicine - students visit about 4 local horse operations and evaluate approximately 28 horses

Equine Theriogenology Introduction - students palpate and ultrasound teaching horses daily in addition to hospital cases

Equine Theriogenology Advanced - students palpate and ultrasound teaching horses daily in addition to hospital cases

Farm Animal Reproduction and Delivery Management/State Fair-Miracle of Birth Exhibit - students observe and assist with over 100 births of sheep, pigs and cattle and explain the importance of LA veterinarians to the public (3,000 per hour or 30,000 per day)

Large Animal Diagnostic Ultrasonography - students ultrasound teaching horses in addition to hospital cases

Necropsy - all senior veterinary students take part in the Veterinary Diagnostic Laboratory which conducts 4,878 postmortems per year.

Small Ruminant Health and Production - students visit 15-20 flocks/herds on area farms and perform routine health procedures on approximately 300-1000 small ruminants and camelids **Swine Records** - students visit 2 farms and evaluate the records of 800,000 sows and 1.5 million progeny

Swine Disease Diagnostics, Therapeutics, and Prevention - students visit 6-10 area farms with variable herd sizes

Swine Economics, Financial Management, and Marketing - no farm visits

Swine Production Systems - students visit 4 farms and evaluate 21,000 pigs and review the production records for 55,000 pigs

Swine Production Training/Swine Farm - students work on a Minnesota swine farm with approximately 600 sows participating in all activities including: supervising about 50 farrowings; 60 sows being detected in heat and service artificially; processing 500 piglets, weaning piglets and moving sows to farrowing; detecting and treating pigs and sows as needed, and pregnancy detection.

Pre-Requisit Requirements for Admission to the D.V.M. Program

Course	Semester Credits	Requirements
ENGLISH	6-9	English composition (two courses, one course must be English composition or its equivalent). Oral communication or advanced composition may be used as an additional course. This requirement is normally satisfied by the graduation requirement at the college the student is attending.
MATHEMATICS	3-5	College algebra or pre-calculus or introductory calculus. The course must have as prerequisite 2 years of high school level algebra.
CHEMISTRY	8-12	General inorganic chemistry including labs. (3 quarters or 2 semesters)
Organic	5-10	Organic chemistry non-terminal sequence. (2 quarters or 1 semester including one lab)
Biochem	3-5	General biochemistry emphasizing metabolic pathways and regulatory mechanisms. Must have as prerequisite organic chemistry substantially meeting the pre-veterinary organic chemistry requirement.
BIOLOGY	3-5	General biology introductory course with lab.
Zoology	3-5	Introductory zoology course with lab (2nd semester of a general biology sequence normally covers this requirement, or animal biology, cell biology or animal physiology).
Genetics	3-5	Science of genetics, not applied or human genetics.
Microbiology	3-5	Introductory microbiology with lab. Must have chemistry prerequisite and must include taxonomy, morphology, physiology and ecology of microorganisms.
PHYSICS	8-12	Introductory sequence with labs. Topics covered need to include mechanics, heat, sound, electricity, light, magnetism, and atomic physics.
LIBERAL EDUCATION	12-18	Social Science and History, Arts and Humanities courses. Applicants should list no more than two courses from any one single department. Applicants entering the D.V.M. program without a baccalaureate are required to list two courses (6-9 credits) from the social science and history area and two courses from the arts and humanities area (6-9 credits).*

Suggested electives include care and management of animals, nutrition, statistics, economics, business management, public speaking and electronic communication.

Admissions Criteria

1. **Academic Measures –** Academic Record and Standardized Test Scores
   A. Grade Point Average - Required Pre-Veterinary Courses - Based on the required courses for admission at the conclusion of summer term 2006. Neither fall 2006 or spring 2007 grades will be used in the GPA calculations. Repeated courses are averaged if retaken within three years; only the new grade is used if it has been three or more years since the course was taken initially. Applicants with a GPA of 2.75 or below on required courses will not receive any points in this area.
   B. Grade Point Average - Most Recent 45 Semester Credits - The last 45 semester hour credits (or 60 quarter hour credits, whichever is most relevant) of graded course work, counting back from and including summer term 2006 (if enrolled that term). To calculate most recent GPA, count back 45 semester or 60 quarter credits of graded coursework, and include the entire term in which the last credit falls. Applicants with a GPA of 2.75 or below on recent coursework will not receive any points in this area
   C. Graduate Record Exam – The new version of the Graduate Record Examination (given after October 1, 2002) is required of all applicants to the veterinary program. The applicant's p score on each section will be used in calculating the number of points. No points will be awarded for percentile ranks at the 35th percentile and below.

2. **Non-Academic Measures –** Experience and Personal Characteristics
   Three faculty members on the Admissions Committee will evaluate the non-academic portion of the applicant's VMCAS application file. The average of the three scores will become the applicant's score on the subjective portion of the evaluation. Applicants must achieve one-half of the points awarded in this stage of the review process to be granted an interview
   A. *Knowledge of the Veterinary Profession, Knowledge of and Interest in Animals and Professional Goals* Experiences with veterinarians, experience in a research setting, experience in a public health setting, experiences with and responsibility for the care and management of animals, and goals in the profession.
   B. *Maturity and Reliability* – Employment experiences and responsibilities, ability to communicate with others, experiences suggesting leadership, extracurricular activities, academic load and the amount of time devoted to employment and other activities while enrolled in college and after.

3. **Behavioral Interview –** Selected applicants will be asked to visit the campus for a one-hour behavioral interview. The behavioral interview is intended to collect and evaluate information, using a series of questions that focus on the competencies required for success in the veterinary profession. A typical request in a behavioral interview would be "tell me about a time when . . ." This allows the applicant to illustrate knowledge, skills and abilities by giving specific examples from past experiences.

Curriculum Digest

1st year curriculum – fall semester

CVM 6011 Professional Skills (2 cr) Integrates subjects in veterinary professional curriculum.Introduction to and practice of professional skills. Communication, ethics, teamwork, leadership.

CVM 6021 Overview of Animal Populations
(1 cr;) Introduction to U.S. production animal agriculture at individual producer level and to roles veterinarians play.

CVM 6100 Anatomy (5 cr)Gross anatomy of domesticated mammals, including development anatomy. Carnivore portion features dog as a model animal and comparatively the cat. Ungulate portion focuses on basic equine anatomy and includes clinically important ruminant/swine anatomy.

CVM 6101 Small Animal Radiology (1 cr) Introduction to radiological principles. Radiation safety, radiographic technique, patient positioning. Emphasizes mastery of normal radiographic anatomy. Identifying anatomic structures on normal plain films and on special-contrast procedure radiographs. Lectures, guided laboratory exercises

CVM 6110 Veterinary Physiological Chemistry (3 cr) Structure/function of cells/tissues. Mechanisms by which animals digest, absorb, and metabolize carbohydrate, protein, lipid, and nucleic acids. Use of absorbed molecules to derive energy and maintain physiological processes. How end products are created/eliminated. Role of hormones and metabolically active tissues. Metabolic abnormalities. Recombinant DNA applications. Molecular aspects of growth/ regulation of gene expression.

CVM 6111 Histology (3 cr) Introduction to light/electron microscopic structure of cells, tissues, and certain organs. How cells associate to perform specialized functions. How organized groups of cells (i.e., tissues) are arranged to form organ systems of the body.

CVM 6134 Nutrition (1 cr) Introduction to principles of nutrition. Basic applications and food sources for major domestic species.

CVM 6301 Clinical Skills I **.** (1 cr) Domestic animal behavior. Basic large animal handling/management skills. Clerk duty in both large animal hospital is required. First of five-part series.

1st year elective – fall semester

CVM 6721 Neonatology (1 cr) Instruction, emergency duty, and practical neonates. Seasonal participation in clinically managing hospitalized foals and periodically reviewing past cases

1st year curriculum – spring semester

CVM 6012 Professional Skills (2 cr) Integrates subjects in veterinary professional curriculum. Introduction to and practice of professional skills. Communication, ethics, teamwork, leadership.

CVM 6022 Overview of Animal Populations II (1 cr)
Introduction to U.S. production animal agriculture at individual producer level and to roles veterinarians play.

CVM 6112 Organology (3 cr) Microscopic/ultrastructural morphology of organ systems (cardiovascular, gastrointestinal, respiratory, urinary, endocrine) in mammalian domestic species.

CVM 6120 Veterinary Neurobiology (2 cr) Anatomy and physiology of central nervous system (brain, spinal cord) and special senses (eye, ear, olfaction, taste).

CVM 6130 Veterinary Physiology (4 cr) Fundamental principles of systemic physiology. Relationships between forces and flows in biological systems. Overview of control system theory as it relates to neurohormonal regulation. Survey of major organ systems.

CVM 6141 Veterinary Pharmacology (2 cr) Principles of drug action, disposition, and clinical applications in animal
patients. Therapeutic uses of drugs affecting autonomic nervous system, cardiovascular system, respiratory/digestive tracts, and kidneys. Therapeutic uses of anti-allergic/anti-inflammatory drugs.

CVM 6201 Host Defenses (3 cr) Introduction to classification, morphology, reproductive cycle, and epidemiology of infectious microbial agents of veterinary importance; properties of disinfectants; therapeutic uses of chemicals and drugs for sterilization, control, and treatment.

CVM 6204 Virology (3 cr) Concept of viruses that affect animal species of veterinary significance. How virus/host factors interact. How these interactions lead to disease or recovery. Applications to prevention/management of disease. Mechanics of virus host interactions in important viral diseases. Using literature to solve virological problems and evaluate strategies for controlling viral diseases.

CVM 6211 Applied Veterinary Genetics (1 cr) Overview of general, molecular, and cytogenetics relevant to animal health, disease, breeding, and production. Emphasizes how genetic information is acquired/used in veterinary medicine and animal agriculture.

CVM 6302 Clinical Skills II (1 cr) Domestic animal behavior. Basic animal handling/management skills. Introduction to hospitals. Both small- and large-animal clerk duty is required.

CVM 6441 Behavior Core (2 c) Ethology, small/large animal behavior, human-animal bond, behavior medicine, psychopharmacology, behavior genetics, learning theory, behavior modification.

1st year electives – spring semester

CVM 6050 Perspectives: Interrelationships of People & Animals in Society (2 cr) Interrelationships of people/animals. Social, economic, health consequences Pets/people sharing urban environment, animal rights, influence of cultural differences on animal-human relationships.

CVM 6545 Regulatory Medicine (offered even years only) (2-4) Explanation of products requiring pre-market approval and those that may be marketed without approval. Post-market surveillance. Adverse reactions, removal of product from market.

CVM 6722 Clinical Anatomy of the Equine Limb (1-2) Practical limb anatomy. Clinical cases, common surgical procedures. Special diagnostic techniques such as radiology, nerve blocks, joint injections, and ultrasound.

CVM 6560 Public Health Issues and Veterinary Medicine Opportunities
(1 cr) Introduction to public health practice and veterinary medicine. Day-to-day work of public health professionals. Public health principles in context. Veterinary medicine related to public health research/practice. Students interact with advocacy groups, media, lobbyists, legislators, regulatory officials, industry leaders, and public health professionals.

2nd year curriculum – fall semester

CVM 6013 Professional Skills (2 cr) Integrates subjects in veterinary professional curriculum. Introduction to and practice of professional skills. Communication, ethics, teamwork, leadership.

CVM 6202 Infectious Agents: Parisitology (4 cr) Systematic and biologic study of protozoan, arthropod, and helminth parasites of animals. Emphasizes relationships to diseases and principles of parasite control.

6203 Infectious Agents: Bacteriology (3.5 cr) Veterinary medical microbiology/mycology. Mechanisms of pathogenesis,
clinical presentations, diagnostic approaches, host responses to infectious challenge. Prevention, treatments. Laboratory exercises are used to test students' ability to isolate/define potential bacterial pathogens.

CVM 6205 Infectious Agents: Pharmacology (1.5 cr) Clinical pharmacology of antimicrobial, antifungals, and anthelmintics used in veterinary medicine. Mechanisms of action, development of resistance and comparative anti-microbial spectrum of agents in their drug classes, and toxicities associated with use, and ways to minimize these.

CVM 6220 Clinical Epidemiology (1.5 cr) Statistical and epidemiological concepts applied to veterinary medicine. OR

CVM 6222 Advanced Clinical Epidemiology **.** (2 cr) Application
of clinical epidemiologic concepts/methods in real-world veterinary animal and public health settings.

CVM 6300 Veterinary Pathology **.** (7 cr) Reactions of cells and tissues to injury and disease, including reversible and irreversible cell injury, disturbances of circulation, blood coagulation, and alterations of cell growth and multiplication. Pathology of body systems, emphasizing reactions of specific organs.

CVM 6303 Clinical Skills III (1 cr) Domestic animal behavior. Basic animal handling and management skills.

CVM 6840 Swine Core (2 cr) Swine medicine, production, and health management.

2nd year electives – fall semester

CVM 6718 Large Animal Practice Based Mentoring
(1 cr) Large animal veterinary practice. Opportunity to practice new clinical skills with a veterinarian who may serve as a mentor. Students visit the practice four times.

CVM 6721 Neonatology (1-2 cr) Instruction, emergency duty, and practical application of principles in evaluating and treating sick equine neonates. Seasonal participation in clinically managing hospitalized foals and periodically reviewing past cases

2nd year curriculum – spring semester

CVM 6014 Professional Skills IV (2 cr) Integrates subjects in veterinary professional curriculum. Introduction to and practice of professional skills. Communication, ethics, teamwork, leadership.

CVM 6102 Veterinary Imaging I (2 cr) Introduction to physics of radiology. Radiographic principles/techniques. Cardiopulmonary/Urogenital systems. Emphasizes interpretation of radiographs (film or digital) germane to common animal diseases. Clinical applications. Lectures, lab exercises using body systems approach to imaging (primarily radiographic) of large/small animals.

CVM 6132 Reproductive Biology (3 cr) Physiology of reproduction, including lactation

CVM 6142 Veterinary Neuropharmacology (1 cr) Pharmacology of drugs that have a major effect on the central nervous system: absorption, distribution, metabolism, and excretion; major mechanisms of action; clinical usefulness; side effects; drug interactions.

CVM 6304 Clinical Skills IV (1cr) Domestic animal behavior. Basic animal handling and management skills.

CVM 6321 Surgery, Anesthesia, Critical Care (4 cr) Introduction to principles/techniques for conducting surgical procedures, managing uncomplicated anesthesia, and providing critical care for common situations in large/small animal species.

CVM 6400 Diseases of Skin & Adnexa (3 cr) Normal form and function, hisopathologic reaction patterns, wound healing, and clinical disease states of the skin and adnexa (horns, mammary glands) of common domestic species

CVM 6430 Cardiopulmonary System Diseases (4 cr) Pathophysiology, presentation, diagnostic presentation, therapeutic approaches, and management protocols for common disorders of the cardiovascular and pulmonary systems.

CVM 6440 Nervous System Disorders (2 cr) Pathophysiology, presentation, diagnostic approach, therapeutic approach, and management protocol for common neurologic/ophthalmologic disorders in domestic species

CVM 6444 Ophthalmology (2 cr) Common procedures for evaluation, diagnosis, treatment of eye disorders in domestic species.

CVM 6460 Urinary Systems Disorders (2 cr) Pathophysiology, clinical presentation, diagnostic approach, therapeutic options, and management protocol for common disorders of the urinary system in domestic species.

CVM 6480 Obstetrics (1 cr) Diagnosis/management of reproductive diseases.

CVM 6534 Veterinary Clinical Pathology (3 cr) Clinical pathology data generation, statistical concepts. Hematopoietic system, its evaluation using laboratory tests. Emphasizes interpretation of individual tests on biochemistry profile and how results guide diagnostic plan. Integration of clinical pathology data for a patient. How to distinguish between diseases with similar clinical or clinicopathologic findings. Lecture, lab, small group discussion, homework.

CVM 6880 Avian Core (2-4 cr) Avian nutrition, physiology, anatomy, and disease.

2nd year electives – spring semester

CVM 6050 Perspectives: Interrelationships of People & Animals in Society (2 cr) Interrelationships of people/animals. Social, economic, health consequences. Pets/people sharing urban environment, animal rights, influence of cultural differences on animal-human relationships.

CVM 6481 Obstetics Lab (1 cr) Techniques for pregnancy diagnosis, obstetric manipulation in large animal species.

CVM 6545 Regulatory Medicine (offered even years only) (2-4 cr.) Explanation of products requiring pre-market approval and those that may be marketed without approval. Post-market surveillance. Adverse reactions, removal of product from market.

CVM 6560 Issues and Opportunities in Public Health (1 cr) Introduction to public health practice and veterinary medicine. Day-to-day work of public health professionals. Public health principles in context. Veterinary medicine related to public health research/practice. Students interact with advocacy groups, media, lobbyists, legislators, regulatory officials, industry leaders, and public health professionals.

CVM 6690 Integrative Medicine (2.5 cr) History/principles of acupuncture, chiropractic, and other commonly used complementary approaches to care of domestic animals. Training requirements for certification. Lectures, case examples, demonstrations.

CVM 6718 Large Animal Community Based Practice Mentoring (1 cr) Large animal veterinary practice. Opportunity to practice new clinical skills with a veterinarian who may serve as a mentor. Students visit the practice four times.

CVM 6930 Medical Management of Zoo Animals (1 cr) Zoo animal handling techniques, including physical/chemical restraint, commonly seen diseases, preventative medicine programs. Adaptation to standard medical practice/management techniques for zoos. Lectures.

CVM 6934 Topics in Zoo Medicine (5 cr) Year-long course. Overview of expertise needed by a zoo veterinarian, applications to specific captive species. Students participate in managing an animal problem or animal group problem, develop diagnostic/management/therapeutic recommendations, research three topics on an assigned species, build reference materials for case care, present findings to keepers at a selected zoo, and develop an item for public education.

3rd year curriculum – fall semester

CVM 6027LA Hospital Practicum (1 cr) Experience in procedures/policies involved in after-hours care of hospitalized/emergency cases in the large animal hospital.

CVM 6103 Veterinary Imaging Part II (2 cr) Musculoskeletal, general abdomen, and alimentary tract systems. Emphasizes interpretation of radiographs (film or digital) germane to common animal diseases. Clinical applications. Lectures, lab exercises using body systems approach to imaging (primarily radiographic) of large/small animals.

CVM 6195 Toxicology (3 cr) Toxicology of minerals, pesticides, venoms, and various toxins. Identification of poisonous plants. Recognition, diagnosis, and treatment of animal poisons.

CVM 6305 Clinical Skills IV (1 cr) Domestic animal behavior. Basic animal handling/management skills. Small-animal clerk duty is required. Using an IV/syringe pump, setting up ICU order sheets, using glucometer/centrifuge to perform "big 4" daily ICUC tests.

CVM 6410 Large Animal Digestive Disorders (2 cr) Digestive disorders of domestic large animal species, beginning with oral cavity. Pathogenesis, clinical signs, diagnosis, treatment, prevention. Case examples, lab exercises.

CVM 6411 Small Animal Gastroentrology (3 cr) Important gastrointestinal (GI) diseases of dogs/cats. Oral cavity (dentistry), esophagus, intestines, liver, biliary tract, pancreas. Obtaining an appropriate history for dogs/cats with GI disorders. Common GI disorders. Therapy/prognosis. How to formulate an appropriate set of differential diagnoses and diagnostic plan.

CVM 6420 Musculoskeletal (2 cr) Presentation, pathophysiology, diagnostic, and therapeutic/management approaches for common disorders of locomotion.

CVM 6470 Multisystemic Diseases (3 cr) Pathophysiology, clinical presentation, diagnostic approach, therapeutic options, and management protocol of disorders of the immunologic and hematologic systems and of multisystemic infectious diseases.

CVM 6451 Metabolic Disorders (3 cr) Endocrine/metabolic diseases of all species. Unique metabolic problems of large animals. Pediatrics/geriatrics of companion animals. Oncological diseases of companion/large animals.

CVM 6483 Reproductive Diagnostic Techniques (1 cr) Obstetric manipulation in domestic species.

Students must take at least 1 lecture and lab from the list below

CVM 6482 Reproductive Diseases of Small Animals (1-2 cr) Physiology/pathology of reproduction, artificial insemination, abortive diseases, postpartum injuries, and breeding management in small animals, horses, and small ruminants. Students focus on 1-3 species.

CVM 6685 Small Animal Reproductive Diagnostic Technique Lab (1 cr) Hands-on clinical experience in the evaluation of small animal reproduction. Two three-hour labs, several projects.

CVM 6702 Large Animal Palpation Lab (2 cr) Hands-on clinical experiences in equine, bovine, or large animal reproductive status/disorders. Students select species.

CVM 6704 Reproductive Diseases of Cattle (2 cr) Common diseases affecting reproductive function in cattle, swine, and small ruminants.

CVM 6727 Equine Palpation (1 cr) Hands-on clinical experience in evaluation of equine reproductive status and reproductive disorders.

CVM 6728 Reproductive Diseases of the Horse (1 cr) Reproduction patterns, breeding practices, management, artificial insemination, economics of reproductive performance, and infertility in horses.

CVM 6793 Small Ruminant Reproduction (.5 cr) Breeding soundness of males, embryo transfer, artificial insemination semen, cryopreservation. Reproductive management of goat/sheep herds. Sire/dam selection, genetic

potential, nutritional affects. Reproductive tracts. Estrus detection, breeding patterns, reproductive pharmacology.Vaginal examination, biopsy/cytology, reproductive microbiology. Camelid progesterone case studies. Captive breeding programs for wild hoof stock.

CVM 6800. Bovine Palpation**.** (1 cr) Practice in diagnostic evaluation of bovine reproductive tract.

3rd year curriculum – spring semester

CVM 6027. Large Animal Practicum: Year 3. (1 cr;]) Experience in procedures/policies involved in after-hours care of hospitalized/emergency cases in the large animal hospital.

CVM 6030. Veterinary and Community Public Health. (2 cr;) Epidemiological approach to veterinary public health. Major zoonoses, animal sentinels, meat/milk inspection, preharvest food safety, environment, occupational health/safety, euthanasia, carcass disposal methods, cruelty investigations, welfare issues. Problem-solving examples.

CVM 6031. International Animal Diseases. (1 cr]) Epidemiology, clinical signs, differential diagnoses, pathology, economic effect of diseases not currently or intermittently present in the United States. International role of veterinarians in controlling disease, increasing food production, facilitating trade.

CVM 6042. Practice Management/Law and Ethics. (2 cr;) Economic, marketing, personnel management, accounting issues in veterinary practice management. .Legal/ethical parameters for veterinary practice.

CVM 6494. Small Animal Anesthesia Advanced Block Core. (1 cr.) Sedative techniques, combination injectable anesthesia, pediatric/geriatric small animal anesthesia, pain control, regional techniques, anesthesia in trauma cases, complications in anesthesia, ventilator use.

CVM 6495. Non-Traditional Pet Core. (1 cr) General/reproductive biology, behavior, husbandry, nutrition, handling, restraint, anesthesia. Common diseases, their treatments. Research animal issues. Special considerations of species commonly encountered in small/mixed animal practices (mice, rats, hamsters, gerbils, guinea pigs, chinchillas, rabbits, ferrets, basic aquarium species).

Required Electives 3rd year – spring semester

Students must choose a minimum of 12 credits within their track area from the following courses.

CVM 6104. Small Animal Special Procedures in Radiology: Advanced Block**.** (1 cr) Common contrast studies used in small animal practice.

CVM 6105. Small Animal Ultrasonography. (1 cr) Body systems approach to imaging (primarily abdominal) of small animals. Ultrasonographic physics/technique, normal anatomy. Portal vein-associated organs, general abdomen (masses, effusions, tissue echogenicity, bowel). Upper/lower urinary tracts, genital tract, echocardiography. Head/neck ultrasound (eye, thyroid, etc.). Background of image generation/interpretation of sonograms germaine to common animal diseases.

CVM 6136. Small Animal Nutrition: Advanced Block (2.5 cr.) Nutritional considerations in health, treatment of disease in small animals.

CVM 6306. Small Animal Clinical Skills: Advanced Block**.**(1 cr;) Advanced clinical skills used by small animal practitioners in private practice.

CVM 6404. Small Animal Dermatology: Advanced Block**.** (1 cr;) Diagnostic/therapeutic considerations in small animal ermatology beyond core in preparation for clinical rotations.

CVM 6414. Small Animal Liver/Pancreas Disorders: Advanced Block. (1 cr;) Complicated diabetes mellitus, feline pancreatitis, and hepatic encephalopathy in dogs/cats. Lectures, small-group exercises.

CVM 6424. Small Animal Orthopedic: Advanced Block.(1 cr;) Dog/cat pediatric, adult orthopedic problems frequently seen in clinical practice. For comparative information, selected human orthopedic problems are presented by guest lecturers.

CVM 6434. Critical Care: Advanced Block. (1 cr;) Case-based discussions of common emergencies: trauma, toxins, acute abdomen, hematologic, respiratory. Emergency procedures, intensive care monitoring, blood gas interpretation. Sepsis, related inflammatory response. Cardiopulmonary resuscitation.

CVM 6436. Small Animal Cardiology: Advanced Block. (1 cr;) Diagnostic/therapeutic considerations related to small animal cardiovascular disorders beyond core in preparation for clinical rotations.

CVM 6442. Animal Behavior Elective: Advanced Block.(1 cr.) Introduction to abnormal/undesired animal behavior, diagnostic procedures, and behavioral/pharmacological modifications.

CVM 6461. A Clinician's Analysis of Urinalysis**.**(1 cr;) Informal, case-based, interactive, in-depth approach to evaluation of urinalyses of clinical cases recently admitted to Veterinary Medical Centers. Improving observational/interpretation skills. Recognizing invitro factors that may alter results of urinalyses.

CVM 6464. Small Animal Urinary System Disorders: Case Based Discussion.(1 cr;) Expands on disorders of small animal urinary system. Introduction to core/additional disorders.

CVM 6471. Small Animal Problems **.**(1 cr;) Problem-oriented approach to canine/feline cases with medical problems. Emphasizes using resources to develop an assessment for a problem, communicating assessment in writing, and developing a plan based on differential diagnoses.

CVM 6497. Avian Medicine and Surgery: Advanced Block**.**(1 cr.)

Bacterial, viral, fungal, parasitic diseases of companion birds. Caged birds, psittacines, raptors, racing pigeons, waterfowl. Behavioral components of common management problems (screaming, biting, feather picking, pathological bonding). Clinical methods of capture/restraint, anesthesia, radiology. Collecting samples for lab analysis. Overview of problems managed surgically.

CVM 6720. Problem Solving in Equine Medicine (1 cr) Diagnosis of a case. Students are given a clinical sign or laboratory finding each week. Generation of differential diagnosis list, diagnostic plan.

CVM 6730. Advanced Equine Practice Elective. (3.5 cr) Intensive course on equine medicine. Theriogenology content/skills beyond core.

CVM 6731. Advanced Equine Practice Elective: Surgical Supplement**.** (2 cr) Equine medicine, surgery, the riogenology content/skills beyond core, necessary for entering predominately equine practice. Intensive lab.

CVM 6790. Advanced Small Ruminant Practice**.** (1.5) Training beyond core in practice of small ruminants. Common diagnostic/therapeutic procedures.

CVM 6801. Advanced Dairy Production Medicine**.**(1 cr) Designed to give veterinary students more in-depth coverage of topics in dairy production medicine at the management, preventive, and herd level.

CVM 6802. Advanced Large Ruminant Clinical Elective**.** (1 cr;)

Topics in cattle health/ production medicine not included in core. More extensive discussion of conditions introduced in core.

CVM 6803. Advanced Bovine Practice: Laboratory Block**.**(1 cr;) Cattle health, production medicine. Topics not included in core, more extensive discussion of conditions introduced in core.

CVM 6805. Food Animal and Exotic Animal Anesthesia**.** (.5 cr;) Techniques/complications of sedation, local anesthesia, and general anesthesia in ruminants, pigs, and some large exotic species. Cases demonstrate anesthetic management of clinical problems common in veterinary practice.

CVM 6841. Swine Behavio**r.**(.5 cr) Common considerations in swine behavior.

3rd year electives – spring semester

CVM 6545. Introduction to Regulatory Medicine. (2 cr.) Explanation of products requiring pre-market approval and those that may be marketed without approval. Post-market surveillance. Adverse reactions, removal of product from market. (taught even years only)

CVM 6560. Public Health Issues and Veterinary Medicine Opportunities. (1 cr) Introduction to public health practice and veterinary medicine. Day-to-day work of public health professionals. Public health principles in context. Veterinary medicine related to public health research/practice. Students interact with advocacy groups, media, lobbyists, legislators, regulatory officials, industry leaders, and public health professionals.

4th year curriculum – Clinical Rotations

Comparative Services

CVM 6691. Veterinary Acupuncture (AcPunct). (2 cr).
Basic veterinary acupuncture theory, point combination, treatment, diagnosis of diseases, hands-on veterinary acupuncture technique.

CVM 6501. Advanced Veterinary Public Health: Food Systems. (2cr) Systems used to raise livestock/poultry, deliver through markets to slaughter or processing facilities, and deliver to consumers. Methods to assess/mitigate risks. Emphasizes public health/food safety issues. Field trips, problem solving, assignments.

CVM 6662. Comparative Anesthesiology (Anes). (2 cr) Practical experience in sedating/anesthetizing routine clinical cases. Previously taught lab protocols/techniques are used in healthy normal clinical cases and adapted for high risk cases. Emphasizes problem solving in formulation of anesthetic plans, management of patients under anesthesia, team work, and pain management.

CVM 6532. Clinical Laboratory Medicine (Labs). (2 cr) Cytology, hematology, clinical chemistry, urinalysis, clinical microbiology, endocrinology, virology, parasitology, immunology. Sample submission, laboratory test methodology. Covers all veterinary species. Emphasizes comparative laboratory medicine. Case based learning, small group discussions, didactic teaching, microscopy.

CVM 6933. Zoological Medicine (MNZM). (2) Introduction to all aspects of health care of zoo animals. Housing, nutrition, preventative health programs. Students assist zoo veterinarians with immobilizations, examinations, necropsies, laboratory work, records keeping.

CVM 6502. Necropsy. (2 cr) Students perform necropsies, collect tissues for lab analysis, interpret clinicopathologic findings, prepare reports on animals submitted to Veterinary Diagnostic Lab, apply basic/clinical science to diseases for animals and populations of animals. Students may participate in history taking. Case findings discussed daily. Student groups present case reports at weekly departmental seminar.

CVM 6634. Comparative Ophthalmology (Ophth). (2 cr) Entry-level ophthalmology. Diagnosis, treatment. Outside readings, review papers, final essay exam.

CVM 6045. Private Practice Preparedness. (2) Pet wellness, human resources, supervision, finance, customer service, conflict management, marketing.

CVM 6500. Veterinary Public Health. (2) Interacting with public health, regulatory, and community activities. Roles in food industry. Public/occupational health, environmental problems. Zoonotic disease problems, food safety, occupational safety/health, euthanasia, carcass disposal, reporting, epidemiologic investigations, animal transportation/control, emergency preparedness, USDA accreditation. Students select clinical case, prepare oral response to hypothetical questions, conduct occupational safety/hazard review, present findings. Raptor Center

CVM 6669. Radiology: Mixed Animal. (2 cr) Skills related to interpretation of radiographs, positioning of patients for small/large animal radiographic procedures. Intravenous urography, cystography, intestinal contrast studies. Students observe small animal ultrasonography cases. Principles/terminology of ultrasound. Computed tomography. Radiographic interpretation in small/ large animal species. Issues related to radiation protection.

CVM 6668. Small Animal Radiology (RAD). (2) Review/practice skills for interpretation of radiographs and positioning of patients. Intravenous urography, cystography, intestinal contrast studies. Emphasizes concepts of radiographic interpretation, in daily rounds. Large/ small animal species.

CVM 6545. Introduction to Regulatory Medicine. (2-4 cr)Explanation of products requiring pre-market approval and those that may be marketed without approval. Post-market surveillance. Adverse reactions, removal of product from market.

CVM 6540. Advanced Veterinary Toxicology. (2 #) In-depth examination of toxins. Clinical, diagnostic, mechanistic, and therapeutic aspects of biotoxins, organic, and inorganic toxins that affect livestock, poultry, wildlife, and companion animals or that threaten public health.

Equine

CVM 6732. Equine Dentistry (EDen). (2 cr.) Small group lectures, demonstrations, labs. Hands-on dentistry on client-owned animals.

CVM 6738. Equine Podiatry (EPod). (2) Concepts of equine podiatry. Anatomy and physiology of foot and hoof. Labs to provide experience supporting lessons learned in lectures. Disease seminars and discussion of actual cases. Labs introducing basic techniques and methods of treatment for injuries.

CVM 6750. Equine Sports and Preventive Medicine (ESPP). (2 cr) Equine competitive disciplines and vet's role, economic/lifestyle issues unique to equine practice, tack, ethical issues. Principles of exercise physiology and performance testing. Vaccination programs, respiratory diseases, diagnostic techniques, facility design, environmental hygiene, optimization of air quality, practical/ legal/ethical aspects of pre-purchase exam, insurance/vet's role, legal issues, physical therapy, massage, acupuncture, emergency first aid, strategies for insect control.

CVM 6747. Equine Theriogenology Introduction (EThI). (2 cr) Techniques in equine reproduction. Handling of stallions/mares. Testing for estrus detection. Rectal palpation, ultrasound exam of reproductive tract. Breeding management, hormone treatments, vaginal examination, uterine culture, cytology/biopsy, semen collection/evaluation, intrauterine therapy, artificial insemination.) Students are in charge of breeding management decisions: select mares from teaching herd, use palpation and ultrasound/pharmacologic aids to ensure timely breeding to frozen semen, which was frozen/assessed by students. Students participate in equine theriogenology cases admitted to Veterinary Medical Center.

CVM 6717. Large Animal Diagnostic Ultrasonography (LAUS). (2 cr) Fundamentals of diagnostic ultrasound in large animal patient. Ultrasonography of equine limbs, joints, abdomen, and thorax. Ultrasound of cases within hospital as available. Dissection of equine limbs required. Students present topic of choice in large animal ultrasound and participate in general emergency duty for large animal hospital.

Food Animal

CVM 6709. Advanced Building Design. (2 cr) Design of animal housing systems. Evaluation of operating production units. Natural/mechanical ventilation systems. Ventilation and building placement. Classroom presentations, on-farm evaluations.

CVM 6825. Advanced Dairy Production Medicine and Nutrition. (2 cr) Integrated concepts from dairy production medicine rotations. Focuses on practical experience in analysis, formulation, and troubleshooting of rations for dairy cows. Determining quantity/quality of feeds. How cows move through dairy at different stages of production and in dry period. Students work with computerized ration programs. Feeding-management, monitoring cattle production, cow comfort, housing. Forage preservation/management.

CVM 6804. Bovine Surgery. (2 cr) Technical/theoretical skills in management of individual cow surgical diseases. Emphasizes abdominal/urogenital surgery of dairy cow. Discussion, labs. Students research topics and prepare for surgery.

CVM 6797. Cow-Calf Herd Health and Production (CCHP). (2 cr) production, medicine, health management. Seasonal health management, purchasing/introducing new stock, facility requirements/design, husbandry, field diagnostics, reproductive management, vaccine protocols, record keeping, zoonosis. Breeding soundness, dystocia management, body condition scoring, ultrasound, castration, dehorning, venipuncture/parasite control. Field trips to cow-calf operations. Marketing system orientations.

CVM 6794. Camelid Medicine, Surgery, Reproduction, and Health Management. (2) Two week rotation. Approximately 15 farm visits are made to alpaca/ llama farms. Approximately 10 alpacas/llamas are evaluated at VMC. Hands-on learning environment. Physical exam, venipuncture, ultrasound. Field surgeries such as castration, dental work, foot trimming, venipuncture, body condition score, preventive herd health management, pharmaceuticals. Common medical/reproductive problems. Interstate health certificates. Tuberculosis testing and necropsy.

CVM 6818. Dairy Diseases: Prevention, Treatment, and Food Quality. (2 cr) How to assist a dairy producer with implementing management practices necessary to control/treat commonly encountered dairy diseases.

CVM 6826. Dairy Production Medicine. (2 cr) Major topics of dairy production medicine. Major subsystems of production/management of

a dairy as it relates to veterinary activities.
CVM 6827. Topics in Dairy Production Medicine I: Mastitis/Economics.
(2 cr) Tools/experience to evaluate herd mastitis problems, make recommendations, develop mastitis control programs, evaluate adequacy of milking system function, and provide therapy for clinical mastitis.
Evaluation of a dairy herd, using biological/economic records. Consulting in evaluating a dairy's strengths/weaknesses, identifying causes of problems, and proposing solutions. Economic basis of dairying. Financial techniques for evaluating producer decisions and veterinary recommendations.
CVM 6828. Topics in Dairy Production Medicine II: Nutrition and Cow Managment. (2 cr) Applied nutrition of adult dairy cow. Topics in cow housing, comfort, lameness, and dairy production systems. Modern dairy production systems. Evaluation of feedstuff management, nutritional management. Aspects of cow management, including housing, stall design, manure management, ventilation, and grouping strategies that promote comfort, health, and performance. Lectures, labs, farm investigations.
CVM 6829. Topics in Dairy Production Medicine III: Theriogenology and Youngstock Management. (2 cr) Applied therio management of adult dairy cow. Youngstock nutrition, health housing, managment. Modern dairy production systems. Physiology of reproduction, armacology of reproductive hormones, pathology of reproductive abnormalities, reproductive management techniques, normal estrous behavior. Interactions of nutrition, housing, and disease prevention on health/growth of youngstock. Lectures, labs, farm investigations.
CVM 6706. Epidemiology and Biostatistics (E&B). (2 cr) How to formulate questions, analyze problems, and develop solutions relating to food animal production systems. Excel, Access, and basic statistical programs. Design/evaluation of field trials. Epidemiology. Statistical process control. Field trips to apply data/results and consult with people in field.
CVM 6806. Food Animal Disease and Diagnostics. (2 cr) Two-week rotation. Food animal necropsies, diagnostic assays.
CVM 6796. Advanced Feedlot Herd Health (Feedlot). (2 cr) Beef cattle feedlot production, medicine, health management. Production systems.
Receiving protocols, economics. Livestock selection/evaluation, health management, facility evaluation. Preconditioning, nutrition, pre-immunization, environmental pollution monitoring, transportation/vaccine protocols, respiratory diseases, epidemics/disease.
Evaluation of small/ large feedlot operations. Body condition scoring castration, dehorning/parasite control. Necropsy, field pathology sampling.
CVM 6813. Farm Animal Reproduction and Delivery Management.
(2 cr) Two week rotation associated with MVMA's reproduction booth (Birthing Center) at Minnesota State Fair. Students participate in delivery of calves, lambs, and piglets, and assist in public education about processes related to large animal delivery and veterinary care.
CVM 6842. Swine Disease Diagnostics, Therapeutics, and
Prevention (SDxT). (2 cr) Major diseases and high-health technologies. Field trips of high-/low-health farms, abattoir for slaughter check. Problem solving, discussion of on-farm disease cases. In-clinic diagnostic techniques.
CVM 6844. Swine Production Systems (SPdn). (2 cr) Alternative systems of swine production. Didactic lectures, labs, special projects. Information management systems, building and equipment designs, health, genetics nutritional systems, marketing alternatives. Influence of production systems on biological and financial endpoints. Upon completion, present project completed on design of various components of integrated swine production system.
CVM 6792. Small Ruminant Health and Production Rotation (SmRu).
(2 cr) Sheep, goat, llama, farmed-deer production, medicine, and health. Nutrition/health management, new stock, facility maintenance, husbandry, diagnosis, record keeping, zoonosis, necropsy. Reproductive management. Breeding soundness, body condition, vasectomy, ultrasound, castration, tail docking, disbudding, dehorning, vaccination, parasites, restraint/
handling, venipuncture, foot trimming, tuberculin testing.Farm visits.
CVM 6854. Introduction to Swine Health and Production. (2 cr) Clinical problem solving based on case examples, first-hand field experiences. Students visit/assess enterprises representing all components of pork chain, from feed milling, to animal production, to slaughter/processing. Roles/responsibilities veterinarians have in food animal production.
Problem definition/investigation. Formal follow up, report writing, oral presentation of recommendations.
CVM 6856. Advanced Swine Health and Production**.**(2 cr) Capstone course. Complex field problems. Student teams take a field case, work it up, and propose steps for farm to resolve problem. Lectures, in-class exercises, field trips.
CVM 6865. Introduction to Swine Production Medicine. (1 cr.) Contemporary approaches to swine practice. Swine production, disease diagnosis. Control, treatment, eradication.
CVM 68 Transition Dairy Cow Management and Clinical Care (TMF**).**(2 cr) Students assist in all aspects of routine day-to-day managementof facility, write detailed report on practical delivery of standard therapeutic or management protocol. Students live in facility during most of rotation. Care of newborn calf, calving cow, later (first two weeks fresh) post-partum cow. Research projects, housekeeping, miscellaneous tasks.

Large Animal

CVM 6711. Large Animal Medicine (LAM). (2 cr.) Medical diseases of horses, cattle, small ruminants, South American camelids, and pot bellied pigs. History taking, clinical diagnosis, patient management.
Assessment of treatment responses. Clinic case material, opportunities to practice common procedures. Small group discussions on clinical diagnosis, treatment, and prevention of common medical disorders.
CVM 6715. Large Animal Surgery and Lameness. (2 cr) General surgery, lameness cases. Emphasizes horses. Some cattle, small ruminants/camelids. Diagnostic/therapeutic management in hospital setting. Cases, rounds, exercises. Students work as part of surgical management or advanced diagnostic/therapeutic techniques available in a referral setting.

Other

CVM 6508. Directed Studies: Pathobiology (DiStB). (2 cr,)Students, under guidance of a faculty member, conduct special project addressing an issue inveterinary pathobiology. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by adviser
and approval by the College's curriculum committee.
CVM 6509. Directed Studies: Diagnostic Medicine (DistD). (2 cr) Students, under guidance of a faculty member, conduct special project addressing an issue in diagnostic medicine. Project proposals include hypothesis, objectives, plan of study, and product for evaluation by faculty adviser and approval by the College's curriculum committee.
CVM 6510. Master's Project: Public Health Practice. (1-3) Directed field research. Original or secondary analysis of data sets related to public health practice.
CVM 6515. Externship (Extern). (2 cr.) Students spend two weeks/rotation in a practice or other professional setting.
CVM 6516. Externship in Public Health Practice. (1-3 cr) Directed field experience or clinical rotation/practicum in selected community or public health agencies/institutions. Integration of knowledge/skills in population science for public health.
CVM 6518. Public Policy. (2 cr) Public policy making at state, national, or international level. Integration of knowledge/skills in animal health, public health, and food safety policy development. Travel may be required. Some financial support may be available. Occurs 1st or 2nd week of January or over summer. Faculty oversee students.
CVM 6530. Orientation to Clinical Rotations. (1 cr) Topics, issues, and procedures encountered during clinical rotations. Transition into clinics. Flow during rotations. Didactic lectures, group exercises, discussions CVM/VMC policies/procedures, patient flow, SOAPs,discharges, admissions, ICU/wards, patient care, UVIS, client communications, infection control, safety, pharmacy, licensure,rotation expectations.
CVM 6525. Rotation at Other Institution (RAOI). (2 cr) Students to spend one-six weeks in an organized program at another degree-granting institution, in an area either not offered at the University or in one that complements experience in a clinical rotation at the University.
CVM 6526. Dermatology Rotation at Other Institution. (2 cr.)
Rotation through which students may take a required dermatology course at another accredited veterinary college.
CVM 6527. Anesthesiology Rotation at Other Institution. (2 cr) Rotation offered allowing students to fulfill their anesthesiology rotation requirement at another accredited veterinary CVM.

CVM 6528. Radiology Rotation at Other Institution. (2 cr) Radiology core rotation taken at another accredited veterinary CVM and used to meet core requirements.

CVM 6529. Equine Medicine Rotation at Other Institution. (2 cr) Equine Medicine Rotation at another accredited veterinary CVM and used to meet a core medicine requirement.

Small Animal

CVM 6630. Behavior (Beha). (2 cr) Students participate in behavior consultations: history taking, diagnosis, outline of treatment protocols, sample collection, demonstration of training techniques, writing of treatment plans, case follow-up. Students present one case, prepare one topic of their choice for presentation during rounds. Daily rounds include discussion of cases, review of behavior-related articles, discussion of problem complexes.

CVM 6632. Dermatology (Derm). (2) Routine dermatologic problems in companion animal practice. History taking, clinical diagnosis, patient management, client education. Students participate in all phases of diagnosis/management of cases. Small-group discussions.

CVM 6634. Comparative Ophthalmology (Ophth). (2 cr). Entry-level ophthalmology. Diagnosis, treatment. Outside readings, review papers, final essay exam.

CVM 6636. Cardiology (Card). (2 cr) Clinical problem solving. Cases of cardiopulmonary disease, including canine/feline congenital heart disease, acquired valvular/myocardial disease, dirofilariasis, arrhythmias, pulmonary disorders. Handson experience in conducting physical exams, recording electrocardiograms/echocardiograms, and reading thoracic radiographs. Group discussions, rounds.

CVM 6644. General Practice (GenP). (2 cr) Students manage their own cases including developing diagnostic, treatment, and preventive health maintenance plans for each patient, performing routine medical/surgical procedures, and conducting client communication/education. Wide variety of cases.

CVM 6648. Advanced Clinical Oncology Rotation. (2 cr.)Case management, self-directed research. Students receive oncology referrals, work with emergency cases and special procedures, assist in treatment decisions and therapeutic options for new cases, and manage ongoing chemotherapy/radiation therapy patients. Emphasizes principles of oncology and patient care.

CVM 6651. Small Animal Ultrasound (SAUS). (2 cr) Ultrasound equipment, physics of ultrasound, planar abdominal anatomy, abdominal ultrasonography/abdominal masses/effusions, sonographic assessment of liver, spleen, pancreatice diseases, urinary tract diseases, male/female repro tract. Head and small parts. Introduction to cardiac ultrasound.

CVM 6661. Neurology (Neur). (2 cr.) Medical/surgical neurology. Providing complete neurological service for clients, patients, and hospital. Integration into all aspects of service, including receiving, work up, surgery, care, communications, and discharges.

CVM 6882. Companion Birds (ComB). (2 cr) Avian medicine/surgery relating to companion birds. Hands-on experience in local aviaries and breeding facilities. Acquisition of basic avian clinical skills in the Raptor Center.

CVM 6664. Elective Small Animal Surgery (ESAS). (2 cr) Elective surgeries such as ovario hysterectomies, neuters, and declaws for small animals. Two-student teams are responsible for pre-surgical evaluation, anesthesia induction/maintenance, surgical procedure, and post-operative care of animals supplied by Humane Society for companion animals.

CVM 6606. Emergency Rotation. (2 cr) Evening/weekend ER service, day ER service. Medical/surgical emergency/traumatic cases. Students assist staff clinicians/interns in diagnosis and case management. Triage, history taking, physical exams, clinical problem solving, patient management. Students give presentation on a case they were involved in within rotation.

CVM 6137. Small Animal Clinical Nutrition. (2 cr) Students manage nutritional needs of patients, perform nutritional assessments of all ICU patients, perform nutritional consults, and see outpatient appointments.

CVM 6601. Small Animal Internal Medicine. (2 cr) Primary case responsibility for wide range of clinical diseases. History taking, physical examination, problem definition, diagnostic/therapeutic plans on assigned cases. Cases typically relate to gastroenterology, urology/nephrology, oncology, neurology, immunology, and cardiology. Daily rounds. Students present case discussion topics and interpret lab data, radiographic evaluations, and biopsy information. Emphasizes effective communications with clients and with referring veterinarians.

CVM 6602. Small Animal Internal Medicine: (SAM B). (2 cr) Problem-solving skills, clinical skills, communication skills, record keeping, ethical issues in referral cases. Methods of knowledge acquisition, including computerized searches and diagnostic programs. Small group rounds discussions. Students assist clinicians in management of referral/emergency cases. Cases typically related to gastroenterology, nephrology, urology, oncology, nutrition, neurology, and cardiology.

CVM 6663. Small Animal Surgery (SAS). (2 cr.) Diagnostic/therapeutic management of surgical patients. History taking, physical examination, communication, problem solving, and surgical techniques. Economic issues. Students work as part of a surgical service team with faculty member, resident, and intern.

CVM 6682. Small Animal Theriogenology (SATh). (2 cr) Breeding management, artificial insemination, semen collection/evaluation, dystocia management. Testing for canine brucellosis, pyometra, vaginitis, and prostate disease. Interactive review sessions, case studies, client cases. Students present review of a “theriogenology question of the month” from JAVMA and present study on reproduction topic of choice.

CVM 6312. Veterinary Dental Rotation (SDen). (2 cr.) Routine/complex dental problems. Students diagnose and formulate treatment plans.

Hands-on training. Basic periodontal procedures, single/multi-rooted extractions, dental radiographic techniques, instrument/equipment care, dental charting

Audit of Selected Curricular Content

Curricular Content	Course #/ Hours	Course #/ Hours	Course #/ Hours
CLINICAL REASONING AND PROBLEM SOLVING			
	Veterinary Clinical Pathology 6534 (56 hours)	Small Animal Internal Medicine 6601/ Large Animal Medicine 6711 (50 hours)	Veterinary Imaging I 6102 (37 hours)
CRITICAL PATIENT CARE			
Intensive care and emergency medicine	Surgery, Anesthesiology and Critical Care 6321 (10 hours)	Small Animal Gastroenterology 6411 (7 hours)	*Critical Care 6608 (80 hours)
Pain management	Comparative Anesthesiology 6662 (10 hours)	Surgery, Anesthesiology, Critical Care 6321 (7 hours)	General Veterinary Pharmacology 6141 (4 hours)
Principles and hospital practice for isolation of infectious disease	Orientation to Clinical Rotations 6530 (3 hours)	LA Digestive Disorders 6410 (1 hour)	Veterinary Public Health 6500 (1 hour)
INFORMATION MANAGEMENT AND THE MEDICAL RECORD			
Herd health	Overview of Animal Populations I 6022 (14 hours)	Overview of Animal Populations I 6021 (10 hours)	*Advanced Dairy Production Medicine and Nutrition 6825 (40 hours)
Individual animals	Small Animal Internal Medicine 6601/Large Animal Medicine 6711 (28 hours)	Professional Skills 6014 (9 hours)	Orientation to Clinical Rotations 6530 (8 hours)
HUMAN ANIMAL BOND			
Behavior	Behavior Core 6441 (30 hours)	*Behavior 6630 (80 hours)	*Animal Behavior Elective: Advanced Block 6442 (15 hours)
Animal welfare	Professional Skills 6011-6014 (6 hours)	*Dairy Diseases: Prevention, Treatment, and Food Quality 6818 (40 hours)	*Transition Dairy Cow Management and Clinical Care (TMF) 6821 (5 hours)
Euthanasia and grief counseling	Professional Skills 6011-6014 (8 hours)	Small Animal Internal Medicine 6601/ Large Animal Medicine 6711 (1 hour)	*Advanced Clinical Oncology Rotation 6648 (14 hours)
EPIDEMIOLOGY AND ZOONOSES			
Regulatory principles	Veterinary Public Health 6500 (4 hours)	Clinical Skills II 6302 (3 hours)	Veterinary & Community Public Health 6030 (2 hours)
Epidemiology	Clinical Epidemiology 6220 (20 hours)	Infectious Agents Virolology 6204 (4 hours)	Parasitology 6202 (4 hours)
Animals & the environment	Veterinary and Community Public Health 6030 (1 hour)	*Dairy Diseases: Prevention, Treatment, and Food Quality 6818 (24 hours)	*Topics in Dairy Production Medicine I: Mastitis/Economics DPM 2 6827 (16 hours)
Zoonoses	Veterinary & Community Public Health 6030 (30 hours)	International Disease 6031 (15 hours)	Veterinary Public Health 6500 (12 hours)

Curricular Content	**Course #/ Hours**	**Course #/ Hours**	**Course #/ Hours**
Food safety	Veterinary and Community Public Health 6030 (18 hours)	Veterinary Public Health 6500 (8 hours)	Infectious Agents: Bacteriology 6203 (4 hours)
Foreign animal disease	International Animal Diseases 6031 (42 hours)	Veterinary & Community Public Health 6030 (1 hour)	Infectious Agents: Virology 6204 (3 hours)
MOLECULAR AND CELL BIOLOGY			
	Organology 6112 (13 hours)	Veterinary Neurobiology 6120 (12 hours)	Veterinary Physiological Chemistry 6110 (10 hours)
PROFESSIONAL DEVELOPMENT			
Career knowledge/options	Overview of Animal Populations 6021-6022 (11 hours)	Professional Skills 6011-6014 (8 hours)	Practice Management/Law and Ethics 6042 (4 hours)
Attributes & worth of a professional	Orientation: Veterinary Medicine 6000 (8 hours)	Professional Skills 6011-6014 (4 hours)	Practice Management/ Law and Ethics 6042 (2 hours)
Ethics	Professional Skills 6011-6014 (8 hours)	Practice Management/ Law and Ethics 6042 (4 hours)	*Bovine Surgery 6804 (2 hours)
Communication	Professional Skills 6011-6014 (20 hours)	Veterinary Clinical Pathology 6534 (5 hours)	*General Practice 6644 (95 hours)
Business and practice management	Practice Management/ Law and Ethics 6042 (20 hours)	Professional Skills 6011 - 6014 (6 hours)	*Financial Planning for the Small Business 6848 (40 hours)
CLINICAL TECHNIQUES AND SKILLS			
History and physical exam	Clinical Skills 6301-04 (30 hours)	Small Animal Internal Medicine 6601/ Large Animal Medicine 6711 (15 hours)	Small Animal Surgery 6663/Large Animal Surgery & Lameness 6715 (10 hours)
Hands-on clinical procedures (e.g., catheter placement, nasogastric intubation)	Clinical Skills II 6302 (53 hours)	Clinical Skills V 6305 (27 hours)	Clinical Skills I 6301 (25 hours)

* Indicates elective course/rotation

DVM/MPH Dual Degree Program

The DVM/MPH Dual Degree program is a collaborative effort between the College of Veterinary Medicine and the School of Public Health at the University of Minnesota that continues to experience significant growth. The program began in 2002 with 3 students and presently has grown to 103 students with 12 veterinary medicine colleges represented.

The program is uniquely designed so any qualifying veterinary student from an accredited veterinary medicine college may apply. The DVM/MPH curriculum includes on-line course work and students are required to attend two May Sessions (three weeks each) at the School of Public. Students are able to complete the MPH degree in two – four years, with careful planning.

The DVM/MPH program requires 42 semester credits and students may transfer up to 14 credits of graduate or professional coursework, with approval. Students complete 22 credits of core public health curriculum and 20 credits of electives with one of the following three focus areas: Food Safety and Biosecurity, Preparedness, Response and Recovery and Occupational Health and Safety. The curriculum requires a public health field experience and a master's project related to public health.

	University	# Enrolled
1	Colorado State University	5
2	Cornell University	2
3	Iowa State University	4
4	Michigan State University	27
5	Purdue University	1
6	University of California - Davis	1
7	University of Georgia	1
8	University of Illinois	1
9	University of Minnesota	56
10	University of Pennsylvania	1
11	University of Wisconsin	2
12	Virginia-Maryland	2
	Total	**103**

The enrollment number of 103 students would indicate that our program is the largest DVM/MPH program in the nation, with the average DVM/MPH program having approximately 15 - 25 students.

As of December 2006, the DVM/MPH program has graduated two students; one each from Kansas State University and University of Minnesota.

Performance Scorecard Matrix – CVM Metrics

Item	Results	Current Benchmark	Comments
NAVLE exam passing rates	FY03 - 87% FY04 - 96% FY05 - 96% FY06 - 94%	COE stipulated 75% passing rate National average 89% passing rate	Passing thresholds changed in FY05
Research: USDA NIH Industry State Private Total	FY06 Expenditures: $3.7M $3.2M $3.7M $3.5M $1.7M $15.8M	Ranking (FY05): 3rd of 28 18th of 28 3rd of 28 6th of 28 3rd of 28 7th of 28	Goal to increase NIH in area of zoonotic/animal infectious diseases and comparative biomedicine.
Tuition: Resident	FY04 - $16.5K FY05 - $17.5K FY06 - $18.3K FY07 - $19.4K	Ranking (FY05): 6th of 28 (3rd highest Public)	Increased 77% in last 7 years
Non-resident	FY04 - $31.1K FY05 - $33.3K FY06 - $35.1K FY07 - $36.9K	2nd of 28 (highest Public)	Increased 74% in last 7 years
Acad. Personnel Diversity Minority/ Female	FY03 - 15.8% / 35.8% FY04 - 18.7% / 40.7% FY05 - 17.9% / 44.9% FY06 – 17.3% / 39.5%	Ranking (FY05): 4th of 28 minority; 10th of 28 female	

Faculty Survey on Resources Summary

#	Topic	Strongly Disagree	Disagree	Agree	Strongly Agree
Q1	The classroom meets my needs for teaching	5%	22%	62%	12%
Q2	The teaching laboratories (including the teaching barn) meet my needs for teaching	6%	23%	64%	6%
Q3	I have the supplies and equipment needed to support my needs for teaching	4%	18%	67%	10%
Q4	I have access to adequate clinical resources (VMC cases, VDL accessions, farms) for teaching	5%	12%	63%	19%
Q5	I have access to adequate information resources through the libraries	0%	5%	62%	33%
Q6	I have access to adequate technical support for teaching	8%	27%	58%	8%
Q7	I have access to adequate departmental support staff for teaching	3%	35%	55%	6%
Q8	I have adequate access to faculty development regarding teaching	5%	27%	59%	9%

Competency Assessment Form

1. Knowledge: Knows how and willingness to show how

Sources of Knowledge **Data Gathering/ Acquisition**	**5**	Exceptional at knowing where to look for sources to obtain knowledge and uses that knowledge with savvy. Demonstrates excellent knowledge of scientific literature relevant to cases under his/her care and accurately interprets this information. Actively gathers specific and relevant information from a variety of sources (e.g., history/physical exam, use of tests and diagnostic modalities, selection of appropriate tests, gains case history needed for care in a timely fashion) to fully understand the problem.
	1	Is often confused about where to look for sources to obtain knowledge and may not know how to use that knowledge in an astute manner. Is unaware of scientific literature relating to his/her clinical cases and/or is unable to accurately interpret this information. Seeks limited additional information to better understand problems; jumps to conclusions when gathering additional information is appropriate.
Basic Knowledge	**5**	Excels at demonstrating technical knowledge specific to the rotation and the application of clinical skills. Has a strong understanding of what he/she knows and does not know. Shows exceptional logic and knowledge in written interpretations and histories, case reports, discussion with faculty, and links observations from assessments to plans/discharge notes.
	1	Fails to demonstrate technical knowledge specific to the rotation and the application of clinical skills. Has a basic understanding of what he/she knows and does not know. Presents only limited logic and knowledge in written interpretations and histories, case reports, discussion with faculty, and links observations from assessments to plans/discharge notes.
Species Knowledge	**5**	Demonstrates complete knowledge of species-specific information of species encountered in rotation (e.g. behavior, nutrition, handling, etc.)
	1	Lacks knowledge of species-specific information of species encountered in rotation (e.g. behavior, nutrition, handling, etc.).
Disease Processes	**5**	Demonstrates complete knowledge of pathophysiology, etiology, epidemiology, immune response, etc. of diseases encountered in rotation.
	1	Lacks knowledge of pathophysiology, etiology, epidemiology, immune response, etc. of diseases encountered in rotation.
Rotation-Specific Material: Knowledge (Please Describe)		
Comments: (Please add any comments regarding student's knowledge here.)		

1. **Clinical Skills:** Applying the know-how in a practical setting

History Taking	**5**	Demonstrates efficiency, thoroughness and accuracy in performing a Hx. Demonstrates ability to ask questions which are systematic, relevant, precise, objective, non-leading and interactive with respect to information obtained. Asks questions of clarification and corrects inconsistencies. Organizes historical information accurately in the medical record.
	1	Unable to gather hx data in an efficient, thorough, accurate manner. Does not ask relevant questions. Uses leading questions. Does not ask questions of clarification. Unable to organize Hx info accurately in the medical record."
Physical Examination	**5**	Demonstrates proficiency in performing a complete physical examination with efficiency, thoroughness and accuracy. Accurately identifies and records normal and abnormal findings.
	1	Unable to perform a complete, thorough, accurate physical examination. Misses significant findings. Does not recognize normal and abnormal findings.
Clinical Decision Making **(includes assessment of information)**	**5**	Displays outstanding ability at integrating relevant information to make sound clinical judgments. e.g. information from Hx, PE, lab data, imaging data, production data, scientific literature, etc. Formulates a complete problem list, accurately prioritizes problems, and accurately determines differential diagnoses. Makes appropriate modifications in response to change in patient status. Takes economic considerations (e.g., cost implications of decisions, making wise choices that make sense in terms of treatment and cost) at a level appropriate for a senior student.
	1	Fails to integrate important clinical information ,resulting in poor clinical judgment e.g. Hx, PE, lab data, imaging data, production data, scientific literature, etc. Unable to formulate a complete problem list, prioritize problems, and/or determine differential diagnoses. Does not make appropriate modifications as patient status changes. Fails to take economic considerations (e.g., cost implications of decisions, making wise choices that make sense in terms of treatment and cost) when making decisions.
Diagnostic Plan	**5**	Devises excellent diagnostic plans based on a strong knowledge base. Provides superior explanation and rationale for the diagnostic plan; explains the diagnostic plan in the context of a specific patient.
	1	Devises inadequate or incomplete diagnostic plans. Fails to provide clear explanation and rationale for the diagnostic plan; does not explain the diagnostic plan in the context of a specific patient.
Treatment Plan	**5**	Devises complete and accurate treatment plan. Provides superior explanation and rationale for the treatment plan; explains the treatment plan in the context of a specific patient.
	1	Devises inappropriate or incomplete treatment plans. Fails to provide clear explanation and rationale for the treatment plan; does not explain the treatment plan in the context of a specific patient.
Organization of Information	**5**	Organizes information in a very systematic manner (e.g., discharge notes, POMR, etc.).
	1	Neglects to organize information in a reasonable manner.
Procedures/Basic Clinical Skills	**5**	Demonstrates superior technical skills and is thorough and efficient in: obtaining histories; performing physical exams; specialty examination skills, anima handling, and is adept at basic procedures (e.g., drawing blood, inserting catheters, tissue handling, use of basic instruments, use of aseptic techniques, etc.),
	1	Demonstrates limited basic technical skills and is incomplete and inefficient at obtaining histories and performing physical exams. specialty examination skills, animal handling. Is not adept at, basic procedures (e.g., drawing blood, inserting catheters, tissue handling, use of basic instruments, use of aseptic techniques, etc.
Patient Care and Welfare	**5**	Provides excellent patient/client care. Pays vigilant attention to details, such as patient's comfort and nutrition. Ensures that treatments are done in a timely and accurate fashion. Readily recognizes changes in patient's condition and communicates changes to supervising clinicians.
	1	Provides substandard patient/client care. Does not consistently look after patient's comfort. Does not consider patient's nutritional care. Inconsistently administers treatments or provides inadequate treatment. Fails to recognize and report important changes in patient's condition to supervising clinicians.
Documentation and Written Communication	**5**	Prepares medical records in an accurate, timely, and efficient manner; adept at using the "system" to enter medical records. Puts great effort into clearly communicating and documenting discharge information. Consistently, writes in a constructive and professional manner; adapts writing depending on the reader(e.g., other DVM's vs. client discharge records).
	1	Tends to prepare medical records that are inaccurate/substandard, not timely, /or efficient; is not adept at using the "system" to enter medical records. Makes no particular effort to clearly communicate and document discharge information. Writes in an unclear, confusing manner that is hard to follow; fails to adapt writing depending on the reader (e.g., other DVM's vs. client discharge records).
Rotation Specific Material: Clinical Skills (describe)		
Comments: (add comments regarding student's Clinical Skills here.)		

1. **Professionalism:** *Work habits, interpersonal maturity and skills, teamwork, commitment, initiative*

Attendance and Punctuality	**5**	Is always present and on time (with the possible exception of a true, documented emergency). Always performs tasks in a timely fashion and meets deadlines.
	1	Does not meet attendance guidelines on syllabus. Has more than the allowed number of absences for the rotation. Consistently comes late to sessions. Consistently misses deadlines.
Initiative and Acceptance of Responsibility	**5**	Willingly takes responsibility and ownership for own action and their consequences (e.g., seeks feedback, willingly admits mistakes). Proactively follows up and follows through on case (pending data, response to treatment, etc.) Always responds to ethical dilemmas in accordance with AVMA and legal standards Always readily assumes responsibility for equipment care and cleanliness. Cleans up after self.
	1	Avoids responsibility for own actions and their consequences (e.g., deflects blame, does not admit mistakes, resists feedback. Fails to proactively follows up and follows through on case (pending data, response to treatment, etc.) Demonstrates behavior that is not in alignment with ethical with AVMA ethical standards and/or legal requirements Consistently fails to assume responsibility for equipment care and cleanliness. Does not clean up after self.
Teamwork, enthusiasm and Attitude Toward Work	**5**	Demonstrates excellent teamwork skills – works cooperatively with VMC personnel and client Conveys an exceptional "can-do" spirit, a sense of optimism, ownership, and commitment and dedication.
	1	Consistently demonstrates poor teamwork skills – does not work cooperatively with VMC personnel and client Demonstrates a consistent sense of pessimism and/or lack of ownership, commitment dedication.
Professional Appearance	**5**	Always dresses in a professional manner. Adheres to dress code. Exhibits excellent personal hygiene.
	1	Tends to be consistently casual in attire. Does not adhere to dress code. May have hygiene issues.
Work Ethic and Dependability	**5**	Exceeds commitments made to others (e.g., doctors, staff, clients).
	1	Frequently commits to things without following through, causing trust to be questioned.
Follow Instructions	**5**	Always actively participates and asks questions to clarify assignments/priorities and carries out task as expected.
	1	Puts limited effort into asking questions to clarify assignments/priorities and/or consistently deviates from the instructions.
Verbal Communication	**5**	Displays excellent communication skills with clients, peers, faculty, and staff, including the ability to initiate communication, gather information, build relationships, give information, and close communication. Takes great care to demonstrate/communicate empathy and compassion.
	1	Displays substandard communication skills with clients, peers, faculty, and staff. Has trouble initiating communication, gathering information, building relationships, giving information, or closing communication. Consistently deficient in demonstrating/communicating empathy and compassion.
Rotation specific Materials: Professionalism (Please Describe		
Comments: (Please add any comments regarding student's Professionalism here.)		

LEARNING OBJECTIVES FOR CLINICAL COMPETENCIES

Organized by COE Clinical Competency with subheadings of U of M Competencies (from our Competency Assessment Form - See Appendix 11-2).

1. Comprehensive patient diagnosis (problem solving skills), appropriate use of clinical laboratory testing, and record management. Students will:

a) History Taking (SAM, SAS, LAM, LAS)

- demonstrate proficiency in obtaining medical histories from clients who present their animals to the VMC for diagnosis and treatment options. Students will demonstrate efficiency, thoroughness and accuracy in this task.
- demonstrate the ability to ask questions which are systematic, relevant, precise, objective, non-leading and interactive with respect to information obtained.
- be able to assess historical information for accuracy and reliability.
- be able to ask questions of clarification and correct inconsistencies in the history.

b) *Physical Examination (SAM, SAS, LAM, LAS)*

- demonstrate proficiency in performing a thorough, systematic physical examination on animal patients. They will demonstrate efficiency, thoroughness and accuracy in this task.
- give adequate emphasis to the purpose of the examination and to presenting complaints, as well as evaluating the other body systems.
- make accurate observations, using appropriate diagnostic instruments and examination techniques. Students should recognize physical and behavioral abnormalities.

c) *Clinical Decision Making (SAM, SAS, LAM, LAS, Radiol)*

- formulate a complete problem list using relevant information acquired from the history, and physical examination, as well as any supportive laboratory and imaging data obtained by the referring veterinarian.
- demonstrate the ability to prioritize the problem list in order of importance and urgency from most important to minor in significance to the patient's health.
- be able to identify and establish a tenable list of differential diagnosis, and/or recognize the possibility of an uncommon or reportable disease.
- demonstrate integration of history, physical exam, and pathophysiology with laboratory and imaging findings in making a diagnosis
- demonstrate understanding and application of pathophysiology as it pertains to laboratory and radiographic abnormalities

d) *Diagnostic Plan (SAM, SAS, LAM, LAS)*

- develop a diagnostic plan for each problem that is identified. The plan should be rational, realistic, logical, and organized, ultimately taking into consideration the costs, risks, and client wishes/expectations.

e) *Documentation and Written Communication (SAM, SAS, LAM, LAS)*

- write complete medical records in a timely manner for each patient under their care using the problem oriented medical record system.
- demonstrate their ability to effectively utilize the VMC computer system to request appropriate diagnostic tests, obtain the results and record them appropriately in the electronic medical record.
- logically, accurately and succinctly document each patient problem in language appropriate for the reader. The resulting medical record should accurately reflect how a patient was managed in our hospital and maintain legal requirements.
- write complete discharge notes in appropriate language for clients and referring veterinarians.

f) Procedures/Basic Clinical Skills (SAM, SAS, LAM, LAS, Radiol)

- effectively perform appropriate diagnostic procedures (such as taking radiographs, obtaining samples for laboratory analysis, etc.)

2. Comprehensive treatment planning including patient referral when indicated. Students will:

a)Treatment Plan (SAM, SAS, LAM, LAS)

- be able to formulate the appropriate therapeutic and/or surgical procedures for all relevant problems identified in their patients.

b) Documentation: Written and Verbal Communication (SAM, SAS, LAM, LAS)

- effectively use the UM-VMC computer system to request prescriptions for patients under their care. Students will document and communicate the daily treatments for their patients in a clear manner.

c) Clinical Decision Making (SAM, SAS, LAM, LAS)

- recognize when patients have disease problems warranting referral and explain the need for advanced care to clients.
- take economic considerations (e.g., cost implications of decisions, making wise choices that make sense in terms of treatment and cost) at a level appropriate for a senior student.

3. Anesthesia and pain management, patient welfare. Students will:

a) Clinical Decision Making (SAM, SAS, LAM, LAS, Anesth)

- recognize the need for analgesia and/or anesthesia, using standards that are appropriate to the circumstances. Students should be able to recognize clinical signs, behavioral cues, and physical parameters that may indicate that an animal is painful.
- anticipate and effectively determine which types of pain management options are available for the various surgical procedures and disease processes present.
- understand the anesthetic protocols that were used in their patients, and subsequently develop and explain a pain management protocol that their patients may require.
- effectively determine a long-term pain management protocol for patients with chronic orthopedic pain.
- perform preanesthetic evaluation of patients, including, but not limited to, reviewing patient's medical history, performing a physical exam, evaluating laboratory and other diagnostic tests that have been performed.
- determine the appropriate ASA status of patients, based on above information

b) Diagnostic Plan - Anesthesia

- determine if additional diagnostic tests should be performed prior to anesthetizing their patient.

c) Treatment Plan - Anesthesia

- develop a logical and coherent anesthetic plan for each patient, based on above information that is appropriate for the species, individual patient, and procedure being performed. This should include any special considerations that may impact upon the anesthetic plan, e.g. the patient will be discharged shortly after the completion of the procedure.
- develop an anesthetic plan with a primarily focus upon the patient's safety and well being, but should also reflect other concerns, such as cost, safety to care givers, and efficiency.

d) Procedures - Anesthesia

- be capable of performing the following procedures in a proficient and timely fashion on appropriate patients:
- Prepare an anesthetic machine and breathing circuit for use, including:
  - Check oxygen sources (hospital piping source, cylinder sources) and replace a depleted oxygen cylinder if needed
  - Check vaporizer levels and refill if needed
  - Select an appropriate breathing circuit and perform appropriate leak tests prior to use
  - Check carbon dioxide absorbent if needed; replace if absorbent is exhausted
- Select all equipment required prior to beginning an anesthetic procedure; organize equipment so it is readily available for use
- Intravenous catheterization
- Administer intravenous fluids appropriately

- Endotracheal intubation
- Monitoring/assessing anesthetic depth by evaluation of ocular reflexes, jaw tone, cardiopulmonary responses, and other reflexes/responses as appropriate for their patient
- Monitoring an ECG
- Monitoring blood pressure by oscillometric or Doppler methods (and direct method in large animal species)
- Monitoring pulse oximetry
- Monitoring capnography
- Monitoring patient temperature
- Perform epirdural administration of local anesthetics and analgesics
- Formulate and administer a constant rate infusion of analgesic drugs
- It is recognized that more experienced staff may need to assist students with completion of these procedures on some patients who may present special challenges.

e) Patient Care and Welfare (SAM, SAS, LAM, LAS, anesthesia)

- use methods of restraint which are humane, effective and consistent with the situation. They should minimize discomfort and risk of additional injury to the restrained animal.
- anticipate the behavior of the animal and adapt methods of restraint in response to the changing needs.
- recognize when euthanasia is warranted and carry it out in an appropriate manner.
- ensure that appropriate medical, behavioral, economic and humane criteria are applied in evaluating the need for euthanasia. They should observe prevailing legal and ethical obligations.
- utilize a method that is consistent with the situation, humane, effective and carries a minimum of risk.
- monitor their patient's physiological status and anesthetic depth, by both physical and mechanical means, on a frequent, repeated basis throughout the anesthetic period.
- diligently record monitored parameters on the anesthetic record legibly and accurately.
- be able to recognize adverse responses or significant changes throughout the anesthetic period, and notify an anesthesiologist of these changes.
- formulate logical, appropriate treatments for adverse responses or significant changes as they occur, and in consultation with an anesthesiologist implement appropriate treatment plans.
- assess their patient's level of pain or discomfort throughout the anesthetic period
- develop and implement methods of alleviating pain and distress in their patients, if needed, in consultation with an anesthesiologist
- accept appropriate responsibility for the care of their patient. The student should accept that failure to recognize and respond to changes in their patient's condition in a timely manner may cause significant morbidity and possibly mortality.
- adhere to VMC protocols for case management

f) Documentation: Written Communication – SAM, SAS, LAM, LAS, anesthesia

- effectively use the UM-VMC computer system to request prescriptions for patients under their care.
- document and communicate the daily treatments for their patients in a clear manner.
- observe and maintain ethical and legal regulations when using controlled drugs and/or writing prescriptions.
- legibly and coherently fill out the anesthesia SOAP form for each patient, including proposed anesthetic drug choices, doses, and volumes
- be able to complete the anesthesia record sheet in a legible, coherent, and timely fashion, such that it accurately reflects all drugs and fluids administered, all physiological parameters that were measured, and any complications that were encountered.

4. Basic surgery skills, experience, and case management. Students will:

a) Rotation Specific Knowledge (SAS, LAS)

- explain the surgical procedure performed as well as alternative procedures and/or modifications to standard procedures.
- explain the reasons for the selected procedure and/or modification.
- describe the gross pathology as they associate with the disease process.

*b) Clinical Decision Making (*SAS, LAS)

- identify the appropriate surgical and physical procedures as a diagnostic and/or therapeutic option. Recommendations should be based on urgency of the case. Students should be able to develop a list of possible complications subsequent to surgical intervention, and develop a plan for their management.
- determine changes in patient status and formulate a revised treatment or surgical plan for the patient.

*c) Procedures / Basic Clinical Skills (*SAS, LAS)

- be able to adequately perform basic surgical techniques and procedures such as making an incision, atraumatic tissue handling, vessel ligation, suturing, etc.
- demonstrate good handling of surgical instruments and hand coordination. Students should use techniques, materials, and equipment that are appropriate and consistent with prevailing surgical standards.
- monitor their patients postoperatively, provide supportive care and therapy, and identify clinical signs consistent with the development of complications. They should be able to provide supportive care and/or therapy that are consistent with the needs of the animal. They should be able to modify the postoperative care and therapies according to changing needs, and ensure that post-operative care is assessment is complete.

d) Documentation: Written Communication (SAS, LAS)

- document the surgical procedures and treatment plan in the patients' medical record. Students will document and discuss the care that the patient is receiving through daily SOAPs.

e) Initiative and Acceptance of Responsibility (SAS, LAS)

- demonstrate the ability to manage routine problems with minimal to no supervision
- proactively follow up and follow through on case (pending data, response to treatment, etc.)

f) Teamwork, Enthusiasm and Attitude Toward Work (SAS, LAS)

- demonstrate the ability to effectively work as a team.
- demonstrate the ability to work cooperatively with the client, referring veterinarian, faculty, house officers, technicians, and staff.

g)Work Ethic and Dependability (SAS, LAS)

- be able to deal with surgical case management effectively

5. Basic medicine skills, experience, and case management. Students will:

*a) Clinical Decision Making (*SAM, LAM)

- demonstrate understanding of results from requested diagnostic tests obtained from patients under their care and use these results to refine initial problems.
- update diagnostic plans based on results of diagnostic tests and use that information to formulate further diagnostic tests appropriate for the patient.
- determine changes in patient status and formulate a revised treatment plan for the patient.

b) Procedures/Basic Clinical Skills (SAM, LAM)

- demonstrate proficiency in animal restraint and handling, venipuncture, administration of medications and other routine procedures.
- anticipate the behavior of the animal and adapt methods of restraint in response to changing needs. They should anticipate and take steps to minimize, the risk to people associated with the situation.

c) Documentation: Written Communication (SAM, LAM)

- document the procedures and treatment plan in the patients' medical record.

- document and discuss the care that the patient is receiving through daily SOAPs.

c) Initiative and Acceptance of Responsibility (SAM, LAM)

- proactively follow up and follows through on case (pending data, response to treatment, etc.)
- demonstrate the ability to manage routine problems with minimal to no supervision.

d) Teamwork, Enthusiasm and Attitude Toward Work (SAM, LAM)

- demonstrate the ability to effectively work as a team.
- demonstrate the ability to work cooperatively with the client, referring veterinarian, faculty, house officers, technicians, and staff.

e) Work Ethic and Dependability

- be able to deal with medical case management effectively

6. Emergency and intensive care case management. Students will:

a) Clinical Decision Making (SAM, SAS, LAM, LAS)

- formulate a complete problem list for a patient after completing history taking, physical examination, and analysis of data obtained from the referring veterinarians.
- prioritize problems from most important/emergency to minor in terms of significance to the patient's health.
- identify the appropriate surgical and physical procedures as a diagnostic and/or therapeutic option. Recommendations should be based on urgency or critical nature of the case.
- develop a list of possible complications subsequent to intervention, and develop a plan for their management.
- determine changes in patient status and formulate a revised treatment or surgical plan for the patient. Students should be able to make clinical decisions on an emergency basis.
- demonstrate awareness of fluid therapy options and creation of a fluid therapy plan for volume resuscitation of emergent patients and ongoing needs of critical patients.

b) Procedures / Basic Clinical Skills

- demonstrate proficiency in animal restraint and handling, venipuncture, administration of medication, and other routine procedures (Point of Care instrumentation, endotracheal intubation, stomach tube placement, etc.)
- be able to provide basic emergency veterinary care that is consistent with the prevailing ethical and legal constraints.
- use techniques, materials, and equipment that are appropriate and consistent with prevailing standards.
- be able to handle critical situations effectively and professionally. They will be able to implement appropriate and effective emergency measures,

c) Patient Care and Welfare

- use methods of restraint that are humane, effective, and consistent with the situation.
- minimize discomfort and risk of additional injury to the restrained animal. They should anticipate the behavior of the animal and adapt methods of restraint in response to the changing needs. They should anticipate and take steps to minimize the risk to people associated with the situation.
- be able to alleviate suffering.

d) *Documentation and Written Communication*

- communicate monitoring parameters for individual critical patients to hospital staff.

e) Initiative and Acceptance of Responsibility

- demonstrate the ability to manage routine problems with minimal to no supervision.

f) Work Ethic and Dependibility

- be able to deal with emergency situations effectively.

7. Health promotion, disease prevention/biosecurity, zoonosis, and food safety. Students will:

7.1 Health Promotion

a) Basic Knowledge of Veterinary Public health (PH)

- demonstrate knowledge of occupational health and safety (OSHA) by evaluating safety practices in veterinary hospitals and providing a presentation of findings
- accurately discuss legal issues surrounding animal control, dog bite prevention, breed standards, and dangerous dog legislation

b) Public Health Decision Making (PH)

- display ability at integrating relevant public health information to make sound clinical judgments.
- demonstrate ability at integrating complicated information from a wide variety of sources to arrive at suitable problem solutions.
- take economic considerations (e.g., cost implications of decisions, making wise choices that make sense in public health terms) at a level appropriate for a senior student.

c) Written Communication (PH)

- research and write a professional letter regarding a real situation or problem related to zoonotic diseases or health promotion.

d) Verbal Communication (PH)

- prepare and deliver an accurate presentation suitable for school-aged children on topics such as veterinary medicine, dog bite prevention, being safe with your pet, and hand washing.
- properly discuss animal selection with nursing home personnel regarding animal health promotion, and the health promotion of residents in a nursing home with live-in companion animals

7.2 Disease Prevention / Biosecurity

a) Basic Knowledge of Veterinary Public Health (PH)

- demonstrate practical knowledge as to how and why public health and regulatory agencies function.
- demonstrate their knowledge base of zoonoses and other related public health, community, and occupational health problems by way of practical problem-solving exercises
- recommend appropriate biosecurity and disease prevention protocols of a live bird market and slaughterhouse
- demonstrate thorough knowledge of biosecurity and disease prevention with regards to animal movement and certification.

b) Disease Processes (SAM, LAM)

- handle animals with potentially infectious diseases in an appropriate manner to prevent infection of other patients (LAM, LAS, SAM, SAS)?
- demonstrate an adequate knowledge of housing and care of hospitalized patients, from an infectious disease/immune compromised patient stand point

c) Public Health Decision Making (PH)

- complete Federal accreditation training and demonstrate ability to integrate relevant public health information to make sound clinical judgements.

d) Sources of Knowledge, Data Gathering/Acquisition (PH)

- demonstrate a thorough understanding of where to obtain knowledge in the event of a foreign animal disease.

7.3 Zoonosis

a) Disease Processes (SAM, LAM)

- *recognize cases with zoonotic potential and provide effective measures of infection control and isolation*

b) Zoonotic Diseases(PH)

- demonstrate a thorough knowledge of the epidemiology of zoonotic diseases through discussion and role-play exercises
- describe proper handling of rabies issues.
- accurately discuss prevention of zoonotic diseases is the setting of a nursing home with live-in companion animals

c) Written Communication (PH)

- research and write a professional letter regarding a zoonotic disease or health promotion topic

7.4 Food Safety

a) Basic Knowledge of Veterinary Public Health (PH)

- observe and discuss appropriate food safety related protocols during a visit to a live bird market and slaughterhouse
- demonstrate knowledge of animal health in relation to food safety with regards to disease testing and eradication.
- demonstrate knowledge, through discussion, of the essential role the veterinarian plays in operation of the food industry in the US including aspects of food hygiene most relevant to the veterinarian in private practice.

b) Rotation Specific Material - Knowledge (LAM, LAS)

- demonstrate appropriate knowledge of drug withdrawal times

8. Client communications and ethical conduct. Students will:

a) Documentation and Written Communication (SAM, SAS, LAM, LAS, Anesth, Radiol, PH)

- communicate problems identified in a manner consistent with the client's ability to understand them, and in a professional manner. They should be able to clarify any uncertainties and offer advice and support where appropriate.
- write complete medical records for each patient under their care using the problem oriented medical record system.
- document changes to treatment plan in the patients' medical record. Students will document and discuss the care that the patient is receiving through daily SOAPs.
- record the information in the electronic medical record in a timely manner.
- logically, accurately and succinctly document each patient problem in language appropriate for the reader.
- complete a medical record in such a manner that it would accurately reflect how a patient was managed in our hospital.
- write complete discharge notes in appropriate language for clients and referring veterinarians.
- observe and maintain ethical and legal regulations when using controlled drugs and/or writing prescriptions.

b) Initiative and Acceptance of Responsibility (SAM, SAS, LAM, LAS, Anesth, Radiol, PH)

- willingly take responsibility and ownership for actions and their consequences
- willingly admit mistakes
- demonstrate self-knowledge regarding when to ask for assistance and advice.
- proactively follows up and follows through on case (pending data, response to treatment, etc.)
- respond to ethical dilemmas commonly posed to a veterinarian in a manner in accordance with AVMA and legal recommendations for ethical conduct
- place needs of client/patient above personal needs

c) Verbal Communication (SAM, SAS, LAM, LAS, Anesth, Radiol, PH)

- communicate problems identified in a manner consistent with the client's ability to understand them, and in a professional manner.
- to explain the reasons for the selected tests/procedures to the client in an understandable way.

- effectively communicate management options, and diagnostic hypothesis to the client, in a manner that is consistent with the client's ability to understand them.
- assist the client in making a decision regarding management and/or therapy of health problem.
- discuss and explain the procedure performed as well as alternative procedures and/or modifications to standard procedures. They should be able to explain the reasons for the selected procedure and/or modification.
- discuss with the client the risks associated with a particular anesthetic and/or analgesic options.
- clearly communicate changes to the patient's status with the client in a manner that is consistent with the client's ability to understand them. They should be able to clarify any uncertainties and offer advice and support where appropriate.
- recognize the sensitivity of the situation, and provide comfort to those who are grieving.
- appropriately and accurately communicate risk of public health issues to a lay audience
- inquire if the animal is insured when appropriate

9. Strong appreciation for the role of research in furthering the practice of veterinary medicine. Students will:

a) Sources of Knowledge, Data Gathering/ Acquisition (SAM, SAS, LAM, LAS)

- utilize appropriate sources of knowledge, including the scientific literature
- demonstrate the ability to discuss relevant scientific literature during case discussions
- demonstrate an understanding of how to critically evaluate and interpret the scientific literature
- be able to discuss the emerging field of Evidence Based Veterinary Medicine and its application to cases under their management
- attend weekly Grand Rounds (clinical research presentations)
- demonstrate an awareness of clinical trials and support clinical research in the VMC

b) Diagnostic Plan

- be able to defend recommendations for diagnostic plans based on sound scientific principles

c) Treatment Plan

- be able to defend recommendations for treatment plans based on sound scientific principles

Acknowledgement: Many of our learning objectives are adapted from Barker I, Bonnett B, Cockshutt J. Professional Competencies of CanadianVeterinarians: A Basis for Curriculum Development, Guelph, ON: OntarioVeterinary College, University of Guelph, 1996.

Clinical Competency Summary

Clinical Competency was assessed on a five point scale in seven required rotations. The following tables show for a Small Animal Medicine and for Anesthesia rotations (as examples), the number competent for each Competency Assessment Form (CAF) question, and which of the COE Clinical Competencies are mapped to that question. The tables with the data for the other required rotations are available on request but not included here due to space constraints. Denominators are the total number of students without missing data for the given rotation. Note that if a student was rated for a given rotation in more than one block, the scores from the most recent block were used. Competency is defines as a score of 3 or greater.

I. Small Animal Medicine (SAM)

SAM (N = 61 Total)														
CAF #	**Clinical Competencies**									**Overall % Competent and frequency of scores**				
										TOTAL (%) Competent	n (%) with given score*			
											2	3	4	5
Sources of knowledge, data gathering/acquisition									9	49 (100.0%)	0 (0.0)	6 (12.2)	31 (63.3)	12 (24.5)
Disease processes						7.2	7.3			49 (100.0%)	0 (0.0)	5 (10.2)	34 (69.4)	10 (20.4)
Clinical decision making	1	2	3	5	6					48 (98.0%)	1 (2.0)	8 (16.3)	31 (63.3)	9 (18.4)
Diagnostic plan	1								9	48 (98.0%)	1 (2.0)	4 (8.2)	32 (65.3)	12 (24.5)
Documentation & written communication	1	2	3	5	6			8		49 (100.0%)	0 (0.0)	2 (4.1)	34 (69.4)	13 (26.5)
Treatment plan		2							9	48 (98.0%)	1 (2.0)	1 (2.0)	26 (53.1)	21 (42.9)

SAM (N = 61 Total)														
CAF #	**Clinical Competencies**									**Overall % Competent and frequency of scores**				
										TOTAL (%) Competent	n (%) with given score*			
											2	3	4	5
Procedures/basic clinical skills	1			5	6					49 (100.0%)	0 (0.0)	1 (2.0)	19 (38.8)	29 (59.2)
Patient/client care & welfare			3		6					49 (100.0%)	0 (0.0)	1 (2.0)	7 (14.3)	41 (83.7)
History taking	1									49 (100.0%)	0 (0.0)	0 (0.0)	22 (44.9)	27 (55.1)
Physical examination	1									49 (100.0%)	0 (0.0)	2 (4.1)	23 (46.9)	24 (49.0)
Initiative & acceptance of responsibility				5	6			8		48 (98.0%)	1 (2.0)	3 (6.1)	23 (46.9)	22 (44.9)
Enthusiasm & attitude toward work				5						48 (98.0%)	1 (2.0)	0 (0.0)	8 (16.3)	40 (81.6)
Work ethic & dependability				5	6					48 (98%)	1 (2.0)	0 (0.0)	11 (22.5)	37 (75.5)
Verbal communication								8		49 (100%)	0 (0.0)	4 (8.2)	20 (40.8)	25 (51.0)
n (%) Competent	**48 (98)**	**48 (98)**	**48 (98)**	**48 (98)**	**48 (98)**	**49 (100)**	**49 (100)**	**48 (98)**	**48 (98)**					

* Note no students had a score of 1

II. Anesthesia (ANES)

ANES (N = 10 Total)						
CAF #	**Clinical Competencies**		**Overall % Competent and frequency of scores**			
			TOTAL (%) Competent	n (%) with given score*		
				3	4	5
Clinical decision making (assessment of information)	3		10 (100%)	1 (10)	6 (60)	3 (30)
Diagnostic plan	3		10 (100%)	2 (20)	6 (60)	2 (20)
Documentation & written communication	3	8	10 (100%)	0 (0)	7 (70)	3 (30)
Procedures/basic clinical skills	3		10 (100%)	0 (0)	5 (50)	5 (50)
Patient/client care & welfare	3		10 (100%)	0 (0)	3 (30)	7 (70)
Initiative & acceptance of responsibility		8	10 (100%)	0 (0)	4 (40)	6 (60)
Verbal communication		8	10 (100%)	0 (0)	4 (40)	6 (60)
n (%) Competent	**10 (100%)**	**10 (100%)**				

* Note no students had a score of 1 or 2

Clinical Competencies across Rotations

The following shows the percentage of students competent in each of the nine COE Clinical Competencies and the required rotation where this competency is assessed. The following show the number of students (there were 97 total) who are competent for each clinical competency (all available scores >= 3). Note that not all students had information for each competency (CAF item) in each rotation. The number competent is calculated with the denominator being the number of students that had at least one of the given cores for that clinical competency. SAM = Small Animal Internal Medicine, LAM = Large Animal Medicine, RAD = Radiology, SAS = Small Animal Surgery, LAS = Large Animal Surgery, PH = Public Health, ANES = Anesthesia.

Clinical Competency 1

83 / 85 (97.6%) competent

Measured by

SAM (8,9,10,13,16,17)
LAM (8,9,10,12)
RAD (8,12)
SAS (8,9,10,12)
LAS (8,9,10,12)

Clinical Competency 2

74 / 76 (97.4%) competent

Measured by

SAM (8,10,11)
LAM (8,9,10)
SAS (8,9,10)
LAS (8,9,10)

Clinical Competency 3

79 / 80 (98.8%) competent

Measured by

SAM (8,10,14)
LAM (8,9,10,13,unk)
ANES (8,9,10,12,13,unk)
SAS (8,9,10,13)
LAS (8,10,13)

Clinical Competency 4

44 / 45 (97.8%) competent

Measured by

LAM (8,10,12,14,18,21)
SAS (5,8,12,16,17,19)
LAS (8,10,12,14,18,19,21)

Clinical Competency 5

59 / 60 (98.3%) competent

Measured by

SAM (8,10,13,21,22,24)
LAM (8,10,12,14,18,19,21)

Clinical Competency 6

75 / 77 (97.4%) competent

Measured by

SAM (8,10,13,14,21,24)
LAM (8,10,12,13,14,18,21)
SAS (8,10,12,13,16,19)
LAS (8,10,12,13,18,21)

Clinical Competency 7-1

32 / 32 (100%) competent

Measured by

PH (2,5,6)

Clinical Competency 7-2

83 / 84 (98.8%) competent

Measured by

SAM (4)
LAM (1,4)
PH (1,2,5)
SAS (4)
LAS (4)

Clinical Competency 7-3

83 / 84 (98.8%) competent

Measured by

SAM (4)
LAM (4,10)
PH (3,6)
SAS (4)
LAS (4)

Clinical Competency 7-4

42 / 43 (97.7%) competent

Measured by

LAM (5)
PH (2)
LAS (5)

Clinical Competency 8

89 / 90 (98.9%) competent

Measured by

SAM (10,21,27)
ANES (10,18,24)
LAM (10,18,24)
RAD (17,23)
SAS (10,13,22)
LAS (10,18,21)

Clinical Competency 9

74 / 76 (97.4%) competent

Measured by

SAM (1,9,11)
LAM (1,9,unk)
SAS (1,9)
LAS (1,9,10)

Large Animal Checklist for Seniors in Large Animal Hospital Practicum (2006-2007)

The following activities can be done on any rotation and checked off by attending faculty/technician

Examination:

- Basic physical examination
- Sinus percussion
- Thoracic percussion
- Use of rebreathing bag
- Cardiac auscultation

Hospital Procedures:

Review a description of the hospital procedure and perform the procedure as circumstances permit.

- Admission procedures including history taking, physical examination, charts
- Fill out and interpret treatments sheets paying attention to "call ifs" and knowing who to call with questions and concerns
- Submit lab samples both physically and via UVIS
- Submit & check lab work via UVIS & VDL
- Submit prescriptions
- Double-check drugs on the treatments and give the right dose (know logical doses)
- Calculate fluid deficits and drip rates for intravenous fluid therapy
- Request LA pharmacy items
- Responsible to keep the hospital clean and orderly
- Understanding normal behaviors, including cows, broodmares, and stallions
- Colic Check
    - Gut sounds
    - Check for pings
    - Capillary refill time
    - Mucous membrane color
    - Vital signs
    - Digital pulse and willing to move
- Set up ICU for colic
- Fill out radiology paper work/folder
- Know how to do a CMT
- Give medications to patients
    - Oral
    - IM
    - IV
    - Sub Q
    - Cephalic catheters
    - Subpalpebral lavage catheters
- Placement of intravenous catheters; monitoring catheters for problems
- Hang, change, supplements & label IV fluids
- Set up fluid administration
- Assessment of hydration
- Bandage Limb
- Rectal Palpation for examination of the digestive and urogenital systems
- Pass nasogastric tube and check for reflux
- Abdominocentesis
- Tracheobronchial aspirate
- Base apex ECG
- Apply laminitis pads
- Sterile technique for procedures and surgery
- Isolation protocol and correct gowning procedure
- Cleaning/washing areas, picking up after procedures

Restraint:

- Use of stud shank over nose, in mouth, on gum
- Foal restraint for procedures and exercise (chest halter placement)
- Apply twitch to horse
- Apply tail jack to cow
- Quick release knot

Diagnostic Tests:

- Packed cell volume (PCV)
- Total solids
- Blood glucose
- Urine specific gravity
- Urine dipstick
- Urine check for ketones
- Fecal flotation and sedimentation
- Fecal occult blood
- Ruminocentesis and sample assessment

Injection Sites and Techniques:

- IM injection (technique and sites)
- Tail bleed or injection
- SC Injection