AVMA Council on Education Self-Study Report
North Carolina State University
College of Veterinary Medicine
2007

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Objectives

State the major goals and objectives of the college, and comment on how they are being met.

The overarching goals of the College are to provide excellent training in veterinary medicine, to expand knowledge in fields related to veterinary medicine, and to transfer that knowledge in a useful and meaningful manner to end users. In order to accomplish these goals, the College must provide state-of-the art facilities, a healthy financial environment, a world-class faculty, and rigorous, innovative training programs.

Facilities: The College has a number of construction projects planned to enhance student learning, upgrade the teaching hospital and increase research space. These projects include the Randall B. Terry Jr. Companion Animal Veterinary Medical Center (a new 105,000 sq ft specialty referral center), expansion and renovation of the current large animal hospital, conversion of the existing small animal teaching hospital into instructional space and a small animal out-patient clinic, and building of a second research building. A flex building will be constructed shortly under the Centennial Campus Authority. Securing public and private funding to complete these projects is a major objective of the College.

Finances: The College must continue to expand financial resources in order to fund growth. The College currently has a capital campaign goal of $100 million. As of December 2006, $72 million had been raised. Additional sources of revenue that we aim to optimize include hospital income, grants and contracts. All College external relations, including development functions, have recently been re-organized to better address the need to expand sources of funding other than state appropriations.

Development of New Knowledge: The strength of the faculty is a key element in the development of new knowledge. Smart motivated individuals must be supported in their efforts to be creative, entrepreneurial and rigorous in their research. A College objective is to further develop the administrative support and organizational structure to facilitate ongoing research efforts. Because the support needed is often highly individualized, such as the effort to bring the National Bio- and Agri-Defense Facility to North Carolina (http://www.ncc-nbaf.org/), specific objectives for each project are developed.

Transfer of Knowledge: The goal of the College is to train veterinary students to the highest level possible, so they may be successful in diverse veterinary careers. With the explosion of knowledge and a generational change in the preferred learning modalities, the College is beginning an examination of the entire curriculum in order to consolidate the information transferred to students, reduce reliance on traditional didactic teaching and increase the use of advanced learning technology. The objective is to develop highly effective methods to transfer knowledge and skills to our students.

Describe methods and/or tools used to measure outcomes of the total program of instruction, research, and service.

Instruction: The success of the veterinary students is measured using overall GPA, individual course grades, and attrition rate. Students in academic difficulty are monitored by the Faculty Committee on Academic Performance and Student Conduct. Clinical Competency is tracked through the use of a skill sign-off book and evaluations of student performance in the 4th year rotations. The success of the program of instruction is evaluated using the NAVLE pass rate, one and five year alumni surveys and employer surveys. The acceptance rate of students into internships and residencies is tracked. Oversight of graduate students is performed by departmental graduate programs or by the Comparative Biomedical Sciences (CBS) Graduate Studies Committee. The intern and residency programs are monitored by the Faculty Committee on House Officer Programs (FCHOP) and the individual residency programs; attrition rate, board examination pass rate and job acceptance post-residency are monitored.

The success of faculty teaching is monitored through student and peer teaching evaluations, intra and extramural teaching and speaking awards, and invitations to present continuing education programs. The scholarly output of the faculty is monitored through tracking of peer-reviewed publications, abstracts, case reports, review articles, lay articles, book chapters, books, and electronic media creations. The curriculum is monitored by the Assistant Dean of Academic Affairs and the Faculty Committee on Curriculum and Course Evaluation to assure that all areas of competency are included. Each course is reviewed once every three years by the committee, using student evaluations.

Research: The success of the faculty in research is monitored using grant productivity, numbers of abstracts and presentations at scientific meetings and number of publications in peer-reviewed journals. Other measures include number of graduate students mentored, editorship of scholarly journals, receipt of national and international research awards, induction into scholarly academies and societies, and service on national grant review study sections and review boards.

Clinical Service: The Hospital Board, Associate Dean of Veterinary Medical Services, and the Department Heads monitor clinical service. Clinical service is tracked for each service unit, not for individual clinicians. Hospital revenue, caseload, number of new patients seen, number of complaints, outcome of client and referring veterinarian satisfaction surveys, and compliance with hospital policy are tracked. Each individual clinician is evaluated by the students on each clinical rotation and by a 360º evaluation at the time of faculty review. The North Carolina Veterinary Medical Association polls veterinarians each year to determine the NCSU VTH Clinician of the Year Award.

List the major strengths and weaknesses of the college.

Strengths

Location: The College is fortunate to be part of a university that is located in an environment that has low unemployment, a strong economy and a well-developed academic and industrial biomedical infrastructure. North Carolina State University is a nationally recognized leader in science and technology transfer (ranked 6th in technology strength of patents, 7th among national research universities in industry-funded research, and 12th among national research universities in non-federally funded research). NC State is particularly adept at developing public-private partnerships, with over 100 companies and agencies housed within the university's research park, Centennial Campus. The recently approved Biomedical Centennial Campus will be centered at the CVM.

Faculty: The College has a motivated and energetic faculty that is committed to building a world-class institution. Their excellence is evidenced by the national and international recognition received, as well as by their enthusiasm for teaching. The senior clinical faculty members are routinely present within the clinic, interacting directly with students. The research faculty involved 28% of the class of 2006 in their research.

Wealth of Teaching Material: The College has a large, busy teaching hospital with high caseload that provides exposure to large numbers of dogs, cats and horses. The Community-Campus Partnership program, based at the Wake County Shelter, provides primary care experience. The Teaching Animal Unit provides exposure to farm animals from year one, allowing students from urban and suburban backgrounds to become familiar with livestock handling and production. North Carolina ranks # 2 in poultry and hog production in the US, thus allowing students exposure to large food animal production units. In addition to access to private ruminant operations, the university maintains large ruminant herds, which are utilized for teaching. Exposure to non-domestic species and exotic pets is provided thorough partnerships with the North Carolina Museum of Natural Sciences, the Sea Turtle Rescue and Rehabilitation Hospital, the North Carolina Aquariums, the Vancouver Aquarium, the North Carolina Zoo, and other organizations.

Strong Training Programs: The College attracts highly qualified veterinary students (entry GPA average = 3.57) and admits 30-31% of in-state applicants and 4-5 % of out-of-state applicants. The curriculum is 75% core material and 25% elective material. The selective program is a unique method of providing elective material in a concentrated two-week period each semester. There are nine focus areas, providing courses and clinical rotations that develop in-depth expertise. Each student chooses a focus area and an individual advisor, who mentors the student. A high percentage of the graduates apply for internships (23-56%) and the acceptance rates are high (62-73%). Additional degree programs include the DVM-MBA, DVM-PhD, Masters of Veterinary Public Health and Comparative Biomedical Sciences graduate programs. The internship and residency programs at the College are highly sought after, often attracting over 100 applicants per position. These programs have trained a number of clinicians who have gone on to become faculty members. In particular, the Clinician Scientist program (a joint residency-PhD program) is designed to train top-level academicians.

Strong Research Programs: The College is fortunate to have a number of internationally known scientists with excellent research programs. Extramural research support ranged from $ 9.9-14.8 million annually over the last three years. The Center for Chemical Toxicology Research and Pharmacokinetics and the newly created Center

for Comparative Medicine and Translational Research provide leadership and coordination for a number of research efforts.

Weaknesses

The weaknesses are partly as a result of the fast pace of growth at the College. Lack of space and a facility that requires renovation to meet current needs were cited by the faculty as concerns. NC State CVM is fortunate to have had relatively stable state support over the last 5 years, but much of the growth of the College has been funded by hospital revenue, extramural research support and donations. Additional concerns include a lack of diversity within the veterinary student population and a reliance on a heavily didactic curriculum. The specialty referral caseload at the teaching hospital allows students exposure to fascinating cases, but can be a bit overwhelming for beginning clinicians. Difficulty in faculty recruitment and retention due to a strong private sector job market has not affected NC State as much as some veterinary colleges, but individual specialties have experienced long periods before successfully filling vacant faculty positions.

Recommendations.

Based on our College's goals and our strengths and weaknesses, we should:

- Look closely at expanding our enrollment in the professional curriculum. Had our enrollments kept pace with the NC population, we would now have well over 100 students in each year of the professional curriculum. This will require new teaching facilities.
- Devise more effective ways to attract a diverse applicant pool. This is a national need.
- Review the entire curriculum in order to create innovative ways to deliver essential, core material and impart the skills necessary to build on this foundation.
- Secure the remaining funding needed to break ground on the Randall B. Terry Jr. Companion Animal Veterinary Medical Center early in 2008.
- Closely examine business practices, communication practices, computerized medical record and image database capability, staffing levels and support service efficiency in the Terry Center in order to function as an effective specialty referral center while remaining a top-notch teaching hospital.
- Develop plans for short-term improvement and expansion of our current equine hospital facility, in order to enhance faculty, staff, student and client satisfaction, while continuing to plan for a new equine veterinary center.
- Assess the relative roles of the in-house, field service and partnership opportunities with existing practices and livestock industries in order to ensure adequate access to food animal case material.
- Look critically at mechanisms and investments to provide access to primary care case material. Existing programs, such as the shelter medicine program and the wellness program, may need to be expanded. Off-site externships and selectives should continue to be encouraged. Other models, including off-site satellite partnerships and practice ownership should be explored.
- Improve working conditions, support infrastructure and hospital efficiency for the benefit of our faculty and staff. Our academic clinical environment must remain positive and rewarding if we are to continue to attract and retain outstanding faculty.
- Develop strategies to enhance our ability to garner significant extramural research awards. The recent development of the Center for Comparative Medicine and Translational Research will assist with this effort. Emphasis needs to be given to facilitating grant development, enhancing interdisciplinary collaborations, enhancing laboratory animal infrastructure, and facility and equipment maintenance.
- Build strong public-private research partnerships in order to develop the Centennial Biomedical Campus. As a part of that effort, we should assess moving to GLP certification for the Central Procedures Lab.

Continually improve the quality of our graduate programs, and in particular, graduate student support offerings, rather than develop a new cadre of programs. Existing programs such as the DVM-PhD, clinician-scientist and summer student research experience need to be emphasized to fulfill our role in producing the next generation of academic leaders.

21.1. Organization

21.1.1. The college mission statement must address:

21.1.1.a. the overall teaching, research, and service commitment,
21.1.1.b. the commitment to undergraduate education,
21.1.1.c. the commitment to provide instruction and clinical opportunities for students in a wide variety of domestic species, including food animal, equine, and companion animal, and
21.1.1.d. the commitment to excellence in program delivery.

21.1.2. Provide a college mission statement for the undergraduate, DVM, or equivalent program.

The mission of the College of Veterinary Medicine is to enhance the career and life success of students, staff, faculty, and veterinary professionals through initiatives in curriculum and lifelong learning, development of leadership and entrepreneurial skills, and partnerships with the community. College programs in animal health and wellness improve animal and human health and well being, and contribute to the economy of North Carolina and beyond through education, research (medical discovery), service, extension and engagement.

Teaching: Teaching responsibilities are multifaceted and include instruction of students in undergraduate, veterinary, graduate, and interdisciplinary curricula and continuing education for veterinarians and allied specialty groups. High quality teaching by a competent faculty must be available to all eligible persons and supported by appropriate equipment, facilities, and services.

The College of Veterinary Medicine constantly seeks ways to improve the quality of its instruction, and periodically reviews its programs, evaluates its faculty, and encourages and rewards excellence in teaching.

Research: The College of Veterinary Medicine strives for quality in basic and applied research in the biomedical, veterinary, and agricultural fields. Research is necessary for the improvement of health care and the quality of life. Excellence in research, besides serving mankind, is a cornerstone upon which a national and international scientific reputation can be built. Research excellence is not easily achieved and once attained must be constantly nurtured. Continual effort must be expended to achieve and maintain research excellence, a condition reflecting the intent and quality of the faculty. The College of Veterinary Medicine must constantly strive to recruit, retain, and reward highly productive research scientists.

Continuing Education and Public Service: The College of Veterinary Medicine provides important services to the people of North Carolina, such as operating a veterinary hospital, a farm service clinic, and a client consultation service; and it develops many informational programs in continuing education and public service. Public service should be viewed as an obligatory responsibility of the veterinary faculty. Not only does it benefit animal owners but also the faculty members who are exposed to naturally occurring disease problems that stimulate their teaching and research.

Each faculty member has a responsibility to participate in the continuing education of veterinarians, other professionals, and in public information on topics relating to the veterinary profession. Faculty service activities are evaluated and rewarded commensurate with teaching and research activities.

21.1.3. Identify the body that accredits the university and the current status of accreditation.

NC State University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; Telephone number 404-679-4501) to award associate's, bachelor's, master's, and doctoral degrees. This University was reaccredited in December 2004 for a period of 10 years. Further information: http://www2.acs.ncsu.edu/UPA/accreditation/index.htm

21.1.4. Provide a flow chart indicating the position of the college of veterinary medicine in the university structure and show lines of authority and responsibility, and give the names and titles of principal university administrative officers related to the college.

See Appendix 1-1.

21.1.5. Provide a flow chart of the organizational design of the college listing names, titles (deans, associate/assistant deans, directors, department heads, etc.), academic credentials, and assignments of the college administrators.

See Appendix 1-2.

21.1.6. Describe the role of faculty, staff, and students in the governance of the college and list the major committees of the college, and their appointment authority.

The College Cabinet is the central administrative body and is composed of the Dean, the Associate Deans, the Department Heads and the Assistant Dean for Business and Finance. The Assistant Deans of Academic Affairs and College Relations, the Executive Director of Development, the Director of the Center for Comparative Medicine and Translational Research, the Director of International Programs and the Senior CVM Faculty Senator are in regular attendance ex-officio. The Cabinet develops the CVM plan, reviews personnel decisions and appeals, reviews the budget, acts on behalf of the faculty and adopts policies for the operation of the CVM consistent with the essentials for accreditation. A critical role is to disseminate information and to effect communication among and between the Office of the Dean, the faculty and staff in each of the respective departments, and other operational units of the CVM. The Cabinet meets monthly. In addition to the Cabinet, the Dean's Council (Dean, Associate Deans, Assistant Dean for Business and Finance) serves as an internal administrative unit in the development and implementation of fiscal and other operational procedures of the CVM.

Voting membership in the General Faculty of the CVM is held by those full-time employees of the CVM who meet the requirements for voting membership in the General Faculty of North Carolina State University as outlined in the Faculty Handbook. The research assistants, teaching or research associates with greater than half-time academic appointments, residents, interns, and graduate students elected representatives may attend meetings of the faculty, with all privileges of the floor except voting. The Department Heads arrange for the annual election of non-voting members by their peers in the ratio of one representative for each ten individuals.

The General Faculty establishes rules for the conduct of its business, elects the Secretary of the Faculty, and establishes the academic policy for the CVM falling within the scope of its programs, including the determination of its curricula. The faculty can also make recommendations on matters of educational policy relevant to the CVM that fall under the jurisdiction of faculty committees (i.e., academic performance, student conduct). The faculty establish such committees, standing and special, as necessary to conduct its business, and receive both progress reports and an annual report at the close of each academic year. The faculty determines the composition of faculty committees, except as herein specified, for the conduct of faculty business and assigns responsibilities to each committee. Regular meetings of the faculty are held at least 4 times a year.

See Appendix 1-3 for a list of CVM Committees.

21.1.7. If the college plans to change its current organization, provide a summary of those plans.

The College recently commissioned an outside review of its external relations. It was recommended that external relations be placed under a faculty administrator, who would oversee advancement functions (development, external relations/communication, alumni society) and other functions to be determined (i.e., government relations, corporate relations). The position of Assistant Dean for College Relations was created as a result of the review.

21.2. Finances

21.2.1. Complete Tables A and B for the past five years and analyze the trends for each category.

Tables A and B are presented in Appendix 2-1. Overall, the financial resources of this College have been adequate to support the missions in education, research, extension and engagement, and service. Expenditures have increased 26% over the last five years, supported in part by increases in state appropriation, but also by steady and continual growth in Sponsored Programs and the Teaching Hospital, as well as increases in other Service areas and contractual student clinical instruction.

Expenditures (Table A)

Instruction: The majority of expense in this category is comprised of salaries and benefits. The decrease in 2004 reflects several vacancies, but the College has the flexibility to retain and utilize vacant salary funds for other areas of academic support. Recruitment of high quality faculty continues to be difficult and requires higher starting salaries for new faculty. Salary increases have ranged from none to 2.5% over the last five year, plus 5% and 7% promotional raises respectively, for promotions to Associate and Professor. The current fiscal year, 2006-07 provided for 6% salary increases, as well as allocating a pool of funds to the University System President to use for retention issues.

Academic Support: The increase in academic support reflects both programmatic expansion and facility renovations and upgrades. Extensive renovations were made in relocating several units to provide space for IAMS Pet Imaging to operate within in the confines of the Teaching Hospital. Both the cafeteria dining area and the two Student Commons areas have been renovated, and major reallocation of laboratory and office space in the main building was done after occupancy of the new research building, as well as to accommodate needed changes in the CVM HVAC system upgrade.

Student Services: The addition of a supplemental application fee has provided some additional operational funding, allowing Student Services to hire seasonal labor to better serve the application process. High staff turnover in 2002 and 2003 resulted in lower expenditures, but increasing salary levels have helped to stabilize the unit.

Teaching Hospital: Expenditures in the Teaching Hospital have increased more than 50% over the last five years due to both the increase in caseload and the increasing complexity of the caseload. Several new clinical services, including an emergency service, a dentistry service and a behavior service, have opened. Several new clinicians are supported directly from hospital revenue. Technical staff has been increased substantially to support both the new services and the complex patient care; in the last five years, 55 new positions have been added to the hospital, bringing the staffing total to ~185 positions. In addition to increases in salary commitments, the Teaching Hospital continues to purchase new equipment, and renovate facilities to support the equipment. Examples include the Linear Accelerator and the conversion to digital radiography.

Other Educational Expenditures: Activity in this category is from clinical service and diagnostic centers in the College. The substantial increase in 2006 is primarily from increased activity in the Vector Borne Disease service lab.

Diagnostic Laboratory: The State diagnostic laboratory is not affiliated administratively within this College, but faculty work closely with the lab in both service and instructional programs.

Student Aid: Unsponsored Student Aid has shown minor growth over the last five years. Budget cuts in recent years, plus poor performance in endowments for several years have limited consistent growth in Sponsored Student Aid.

Sponsored Research: Despite being relatively level for FY 2004 and 2005, annual research expenditures have increased more than 22% over the last five years.

Other Sponsored Activity: Although there is some fluctuation year to year, overall expenditures have varied less than five percent over the last five years.

Extension and Public Service: The Office of Continuing Education and Public Programs continues to expand its offerings of courses, requiring that a third staff member be added to the unit.

The major increase in 2006 includes the expenses for design development for a new Medical Center, expected to break ground in 2008.

College Revenue (Sources of Funds) Table B

State Appropriations: With the national and state-level economic problems of recent years, this College has experienced several permanent and one-time budget cuts over the last five years ($606,000 permanent, plus $548,000 one time in FY 2004 alone). In addition, there have been both budget increases and decreases based on enrollment changes from year to year. Even with these cuts, the College has seen a net increase of 11+% in state appropriated funding over the last five years. The percentage of state allocation relative to total CVM revenue still shows a decline, indicating a steady growth of alternate revenue sources. The substantial growth in hospital revenue has allowed the hospital to be more self-supporting, thus freeing up College funds for other programmatic areas.

Tuition and Fees: Yearly tuition and fees for the 2006-2007 academic year are $10,246 (In-State) and $33,009 (Out-of-State).Tuition and fees as a component of total State appropriations have not been reported; the College's permanent budget is not affected unless enrollment and residency projections are not met. Only once has this resulted in a shortfall, which was covered by University Administration. In 2001 the College did implement a tuition increase specific to the DVM professional program, and has realized approximately $900,000 in state funds as a result of this increase being phased in over four years, 2001-2004.

Endowment Income: After a very poor year in 2002, when net losses were realized on endowment investments, endowment income has shown steady growth. The total balance of endowment holdings has increased over the last five years from $5,832,296 to $7,344,171. Endowment income will continue grow, primarily from a $20 million, 10-year commitment from the R. B. Terry Jr. Charitable Foundation.

Current Gifts: Current gifts have shown a substantial increase over the last two years as the College embarked on a major building campaign to raise funds for the new Randall B. Terry Jr. Veterinary Medical Center. Both Endowment Income and Current Gifts data have been restated from previously filed Comparative Data reports to reflect a correction in the data reported.

Sponsored Program Income/Cost Recovery: The College has seen a 25% increase in Sponsored Program revenue over the last five years. With the establishment of the Center for Comparative Medicine and Translational Research, it is expected that research funding will continue to grow in spite of the increasingly difficult federal research funding environment. Of note over the last five years is the award of a USDA Food Safety Research Response Network grant of $5 million over five years. In addition, a CVM faculty member received the prestigious NIH Method to Extend Research in Time (MERIT) Award in FY 2004. This will extend funding for ten years. An EPA Training Grant, "Cooperative Training in Environmental Sciences Research" has also been renewed for five years (2006-2011) for a five-year total of $4,544,890.

Other Activity: This category includes revenue from multiple diagnostic and analytical laboratories, as well as revenue from contractual agreements with Ross University and St. George University Veterinary Schools. Both the Vector Borne Disease lab and Canine Diagnostics have seen a substantial increase this last year, which will probably level off due to facility and staffing constraints.

Teaching Hospital: Revenue from the Veterinary Teaching Hospital has shown particularly strong growth in the last two years. Increases in caseload and complexity, and the addition of an emergency service, more critical and intermediate care facilities, and advanced imaging capability (Magnetic Resonance Imaging) continue to drive hospital revenue growth.

Diagnostic Laboratory: The State diagnostic laboratory is not affiliated administratively within this College, and therefore there is no associated revenue from the lab.

Other sources from Sales and Services: The College has a number of clinical service labs, some partially subsidized and some self-supporting. Revenue from these labs has been fairly constant over the last three years.

Reserves and Transfers: Professional Services fees, or Veterinary Faculty Practice Plan (VFPP) dollars, are generated from hospital services, and then are distributed out to the Deans and departments on a quarterly basis. The intra fund transfers from the central VFPP account and reallocations from Deans are closely aligned with the total amount of VFPP income generated. The expenses are recognized at the department level when the funds are used.

21.2.2. Comment on the strengths and weaknesses in revenues over the past five years.

Strengths
The state economy has been rebounding, and FY 2006 was the first year in several that did not require a budget cut or reversion. In addition, for the first time in many years, the College was granted carry forward of committed but unspent funds, allowing for more efficient forward planning and use of funds. Faculty got an average 6% salary increase in the current fiscal year. Increasing revenues from the Veterinary Teaching Hospital, Ross University and St. George University Veterinary Schools, and research overhead have all spared state dollars and allowed growth of the overall program.

The Teaching Hospital continues to show strong growth and has been able to fund not only new staff support positions, but is also funding clinical faculty positions in order to support the increase in caseload and expand services. The VTH also generates $2.5-3 million in Practice Plan funds annually that is available the Dean and departments as non-reverting funds for programmatic support and development, as well as for some salary support.

The pledge from the Randall B. Terry foundation has greatly increased the funding support towards the new Terry Veterinary Medical Center. While the pledge is a guarantee of $2 million per year for ten years, the first two years installments have been $2.5 million and $3 million, respectively. It is anticipated that the Foundation will continue to donate over the pledge amount for the duration of the pledge. In addition, the CVM is in a University-wide Capital Campaign, and this College is at 72% of a $100 million goal.

The College is reorganizing its Development Office under the guidance of an Assistant Dean for College Relations, and, as part of the strategic plan, additional development officers will be added to the program. The new fundraisers should positively impact both the College's Endowment and Current Gifts.

Weaknesses
Obviously, substantial budget cuts are a weakness to any program. With budget flexibility, the College has managed to maintain and grow programs, and continues to develop in new areas such as Animal Welfare, Ethics and Public Policy, though this is often achieved through the use of one-time funding, or soft money.
The biggest risk with loss of permanent budget and/or limited budget increases is the inability to compensate faculty adequately. The College has lost several promising young faculty and has been non-competitive in a number of new faculty recruitment efforts over the last few years, partially due to the inability to match the salary levels and benefits packages at other institutions. Established and senior faculty members are feeling the results of salary compression, as new faculty are being hired at higher market rates. Several years of minimal salary increases are detrimental as faculty members begin to look for better opportunities.

The CVM continues to increase revenues from sponsored research, but receives only a portion back from the University. The University first adjusts for such things as reduced F&A recovery for Centers, MOA's and other items considered in the best interest of the University. After adjustments, the University Research Office retains 15% of receipts for administrative support, with 85% allocated for infrastructure costs, maintenance, research administration and other campus/college initiatives. The University keeps 58.9% (of the 85%) leaving 41.1% returned to the Colleges/units. After mandatory expenses, such as the Medical Surveillance Program, this College receives approximately 30% or less of total F&A revenues generated by CVM researchers.

21.2.3. Provide a comprehensive trend analysis of revenue sources that have supported the professional teaching program over the past five years (graphs or other visual presentations would be helpful).

Appendix 2-2 shows the five-year trend of the major sources of the revenue for this College. On a percentage basis, the Teaching Hospital has shown the most growth, while state appropriation funds have remained relatively flat.

21.2.4. Describe how revenues over the past five years have impacted the college's ability to provide a contemporary professional teaching program and ancillary support services.

One of the major impacts of the recent five years has been the completion of the new research building on the Centennial Biomedical Campus in 2005. Prior to the opening and occupancy of this facility, many of the College faculty were located off campus. Though not far, the distance made both student/faculty and faculty/faculty interactions more difficult. In addition to bringing all faculty to one campus, there was a complete reorganization of faculty office and laboratory space in the main building. Faculty offices and laboratories, along with graduate student space, were relocated for better utilization of available space and for efficiency of collaborations. Most of the funding for the new building was state bond monies, but the College is using indirect cost recovery revenue for loan payments.

Other improvements to facilities include major renovations of the library, the cafeteria dining area, two student commons and outside patio seating. The College continues to expand fiber connectivity to all major outlying buildings, and has implemented a wireless plan throughout the main building and the research building. Computer replacements and upgrades are continual, with a College goal of replacing faculty computers every three years. Students are provided palm pilots as part of their program, and a number of applications and reference material have been developed for use on the devices.

The Teaching Hospital has been able to make several critical renovations, including a new state of the art Intensive Care Unit, space relocation and upgrades for cardiology, oncology and dermatology, creation of Intermediate Care facilities, a clean room in the pharmacy for compounding, and creation of a separate entry 'day visit' space for equine patients. A number of recommendations from the College Infectious Disease committee were also implemented, including construction of a separate large animal isolation barn, as well as modifications to the existing barn.

The last five years has seen the partnering with IAMS Pet Imaging to provide MR Imaging in the Teaching Hospital, and the construction of a vault and linear accelerator for improved oncology services. Clinical faculty have been able to develop a centralized Radiology Information System for improved in-house patient care and student instruction, supported by all new digital radiography equipment.

21.2.5. Compare the percentage of hospital income to total hospital operational costs.

While the Teaching Hospital is subsidized for a portion of its salary expenditures, all operating support was lost to budget cuts in the 1990's. Through expanded caseload, strategic hires, and new services, the Hospital has been able to fund all operational costs and all additional staffing. The hospital manages capital equipment repairs and renovations, and much of new equipment costs. It has been able to add key residency and intern positions. Within the last five years, the VFPP document was amended to provide the Teaching Hospital with its own non-reverting revenue stream. This gives the Hospital the means to accumulate emergency reserves to be used in the event of disruption of services (hurricanes/ice storms/infectious disease outbreaks). Even though the Hospital has a policy of full payment at time of service, there is still a substantial accounts receivable (~$400,000).

The Teaching Hospital now has administrative oversight of the Equine Health Center in Southern Pines, and is expanding clinical services at that site. There will be a major fundraising campaign for renovations at that site.

The need for the Veterinary Teaching Hospital to become self-supporting has resulted in the closing or reduction of some programs, such as equine ambulatory and pet avian, that are of educational benefit, but not financially feasible. The College is using other means, such as externships, to provide experiences in these areas.

21.2.6. Describe anticipated trends in future revenues and expenditures.

With the State of North Carolina's improved budget situation in recent years, it is hoped that salary increases from the Legislature will continue to be at least at the 5% level. It is not expected that the College will recover any funds lost to budget cuts, but University Administration is supportive in funding retention offers and new faculty startups. The College is recruiting for a new Executive Director of Development and it is expected that there will be an expansion of development activity and fund raising. The College plans to add at least two more development officers within the next year.

Expenditures are expected to increase in relation to expanded operations and general inflationary changes. Faculty recruitment and retention costs are expected to increase substantially, and the College will need to utilize non-state funds, such as VFPP to remain competitive for the most highly qualified candidates.

21.3. Physical Facilities and Equipment

21.3.1. Provide a brief description of the major functions of, or activities that take place in the facilities used by the college in fulfilling its mission.

The physical facilities were designed to facilitate the College programs. Specific features of the physical facilities include: 1) the main building was constructed under one roof and provides the facilities to accomplish the major College missions; 2) the Veterinary Teaching Hospital is centrally located within the main building; 3) areas were organized to promote maximum interaction between programs and between individuals; 4) the facilities are functional and flexible; 5) the design allows for future expansion; and 6) the building is attractive. The main building was completed in 1982 and dedicated in 1983. Several modifications and additions to the buildings have been completed. A new 100,000 sq ft research building was completed in 2005.

Buildings located on the CVM campus include the main building, the research building, auxiliary office space ("Annex"), Teaching Animal Unit (TAU) buildings, and the Equine Isolation Unit. One modular structure remains on the CVM campus.

The main building houses the vast majority of the units involved in the educational, clinical service, and research activities of the College. Such units include the administrative offices of the deans, department heads, and their staff; the business office of the College; the veterinary medical library; lecture rooms, conference rooms, and teaching laboratories; faculty, house officer, and graduate student offices; research laboratories; the electron microscopy suite; the Biomedical Communications audiovisual production facility; the hospital and research computer facilities; the cafeteria; and the entire Veterinary Teaching Hospital. The remaining buildings have been specifically designed and located adjacent to the main building to support the missions of the College.

The CVM is currently leasing 4,800 sq ft for research laboratory purposes in Pylon Industrial Park (i.e., Pylon Research Laboratories) at an annual cost of $103,000.

21.3.2. Provide an area map that indicates the principal facilities of the college and describe distance and travel time to off-campus facilities.

See Appendices 3-1 and 3-2.

NC State University is divided into five Campuses: Centennial Biomedical, North, South, Central and Centennial (see Appendix 3-1). The College of Veterinary Medicine (CVM) campus is located on the Centennial Biomedical Campus, approximately two miles west of the Central Campus of the University. The CVM campus is 181.5 acres, which includes a five-acre lake used for aquatic research, and 20 acres of woods; approximately 100 acres have been reserved for pasturing of animals, and approximately 75 acres have been used or reserved for building sites.

The Wake County Animal Care, Control and Adoption Center is located in the eastern part of Raleigh, NC, approximately 12 miles from the CVM; driving time is 20 minutes.

The Equine Health Center is located in Southern Pines, NC, approximately 60 miles from the main CVM facilities in Raleigh; driving time is 60 minutes.

The Center for Marine Science and Technology (CMAST) is located in Morehead City, NC, about 220 miles or 3.5 hours driving time.

The most commonly used NCSU University Field Laboratories (UFLs; operated by NCSU College of Agriculture and Life Sciences) are located along Lake Wheeler Road, about eight miles from the CVM; driving time is 15 minutes. Other UFLs, or farms owned by other state agencies, are located throughout the state.

21.3.3. Describe the adequacy (pertains to all facilities used by the college whether on-campus or off-campus) of:

21.3.3.a. safety measures in all areas of the college including posted protocols in high-risk areas,

The CVM College safety program is a component of the University wide safety program and is overseen by the College Safety Committee. The program incorporates security, safety plans, safety equipment, radiation safety, rules and procedures, accident/incident reporting, medical surveillance, waste disposal and fire inspection (to list a few examples).

Environmental Health and Safety Center: NCSU has established administrative procedures for the reduction and prevention of on-the-job accidents and illnesses and for the protection of the environment. The Environmental Health and Safety Center (EHSC) administers and implements the occupational health and safety policies and procedures promulgated by EH&S and by University health and safety committees. The EHSC is staffed by professionals in radiation safety, industrial hygiene, occupational safety and environmental management. EHSC activities include providing assistance to members of the University community in evaluating and minimizing risks, the proper disposal of toxic materials, and the maintenance and analysis of records and documentation for regulatory agencies. The EHSC maintains a comprehensive web site with links to the various components of the university's program.

Occupational Health Program: The EHSC is responsible for administration of the NCSU Occupational Health and Safety Program for Personnel with Animal Contact. All employees with animal contact must enroll in the program by completing and submitting a questionnaire. The questionnaire is sent to Student Health Services (SHS), which is responsible for tracking participation and evaluating risks. Paperwork is returned to the employee's supervisor indicating if any additional vaccinations or workplace accommodations are recommended. Employees (personnel who receive a paycheck from NCSU) are covered by this program; this includes nearly all CVM house officers and graduate students. The program for veterinary students deviates from the above as follows. Students are not required to submit a questionnaire to SHS, but do receive, before starting school, information that alerts them to potential hazards in the veterinary curriculum, and advises contacting their own physician, or a SHS physician, with any concerns. In accordance with NCSU policy, course syllabi must contain health and safety-related information.

Safety Training: In-depth training about the specific hazards of the individual's workplace is provided by the supervisor; supervisor's responsibilities are defined on the EHSC web site. The University provides training on protection from radiation hazards, biohazards, and chemical hazards. Completion of a campus-wide radiation safety course is required before investigators are allowed to order radioactive substances; on-line training is also available.

Safety Committee: The Safety Committee is composed of representative employees (faculty and staff) of the different areas of research, teaching, and service of the College. This committee meets once a month to address safety-related issues, resolve and address safety problems, facilitate the communication of safety topics to employees and students, and act as a sounding board for any safety issues of concern. The director of University Life Safety Services or his designee, or both, attends the College Safety Committee meetings, bringing up-to-date information of safety-related issues and information. The Safety Committee members report to their College departments and different services. They bring to the Safety Committee any relevant safety issues that need to be addressed. One member from this committee serves on the University Safety Council.

Security: A key part of the safety measures established at the CVM relates to security for faculty, staff, and students. The foundation for this security involves two main components, the card access system for the CVM main buildings and the fenced perimeter for the Large Animal Hospital. The card access system requires an individual to swipe an identification badge past a scanner to gain entrance to a building or a particular area of a building. The access as identified on the badge is both zone and individual specific. Thus, individuals are limited to where they can gain access on the CVM campus. An established card access committee defines the criteria for the level of access. The Dean and/or his designee approve all requests for badges. Temporary cards may be issued to visitors based on established policy and procedure.

All Main Building and Research Building main entrances and some additional outside doors have card access scanners. There are various internal doors within the CVM as established by the card access committee to limit access to defined groups. Some of the main entrances on the card access system are programmed to be open during normal business hours but these entrances have a receptionist function available to monitor access.

An established perimeter fence limits access to the Large Animal Hospital. Two vehicle gates operate on a pressure plate system and upon vehicle approach open to the Large Animal Hospital during regular business hours. There is a receptionist to greet clients. After regular business hours, the pressure plates are programmed to

not open for vehicles waiting to enter the perimeter. One gate must be opened manually from within the Large Animal Hospital. The other gate can be opened by punching a code into a keypad. The keypad code is provided to a client by the after hours emergency clinician so they may enter the gated perimeter. The pedestrian gates are key access.

In addition to the fenced perimeters, there are specific entry points (doors and breezeway entrances) into the large animal hospital. There are times throughout the year when some of the larger entrances in the Large Animal Hospital must be left open to ensure circulation of air required for quality patient care. Other than these entrances/times, the Large Animal Hospital is locked after hours.

After-hours and on-call faculty and staff are provided with "Emergency Passes" authorizing them to park in the client areas so that the distance they need to walk to the VTH from their car is minimized. In addition, if a faculty or staff member needs to walk to their car in the parking lot after dark, they can call Campus Police, who will provide an escort.

Safety Plans: All College laboratories have approved Safety Plans, which are reviewed by the Environmental Health and Safety Center on an annual basis. The principal investigator or supervisor of each research laboratory is responsible for safety in his/her laboratory or department. This individual must ensure that each person working in his/her area has received the proper training to work in that environment. All the possible hazards that a person may encounter in the laboratory are described in the Safety Plan. The Safety Plan also indicates the safety equipment located within the laboratory, fire prevention guidelines, evacuation plan, chemical spill plans, housekeeping rules, guidelines for handling chemicals and/or hazardous materials, hazardous waste disposal, waste collection policy and storage of chemicals.

Safety Equipment: The main CVM building is equipped with emergency showers and eyewash stations.

Radiation Safety: The CVM works closely with the Environmental Health and Safety center to insure that the College is in compliance with all university and state regulations regarding radiation safety. This includes the establishment of standard operating procedures such as badge monitoring in the Veterinary Teaching Hospital. EHSC conducts quarterly inspections to ensure that departments are following the outlined procedures. If deficiencies are identified corrective action is undertaken.

Rules and Policies: The major departments have established rules and procedures to ensure that a safe environment exists for staff and students. For example, The Veterinary Teaching Hospital has both clinical and administrative rules and procedures to ensure consistency in how the hospital provides a safe working environment. As a specific example, rules relating to infectious disease are established in the Veterinary Teaching Hospital by an Infectious Disease Committee, which reports to the Hospital Board.

Accident/Incidents Reporting: The University has established procedures for reporting accidents and incidents. This enables the identification of trends so corrective action may be taken but also to ensure that proper investigation and follow up occurs should the situation require a workman's compensation process.

Nosocomial Medical Surveillance: The Veterinary Teaching Hospital establishes infectious disease protocols, and conducts medical surveillance to track microbes and to monitor the hospital's cleaning and disinfection techniques as well as identify antibiotic resistant bacteria.

Waste Management: The CVM has established procedures for dealing with waste. Hazardous waste is classified based on defined criteria and disposed of accordingly. Infectious waste is stored in red bags, red carts, or red sharps containers and is disposed of by licensed carriers.

Fire Safety: The CVM works closely with EHSC Fire Protection to insure all requirements are met and all fire safety equipment is functional. This includes monthly inspection of fire extinguishers and regular fire drills.

Research Involving Hazardous Substance Use in Animals: All hazardous agent use in animals is reviewed by the Institutional Animal Care and Use Committee. Protocols that include substance administration are referred to the EHSC for input, and the Director of EHSC is an ex officio member of the IACUC. For new projects involving hazardous agents, a detailed SOP is prepared in consultation with the PI, and EHSC as needed, and approved by the Director of Laboratory Animal Resources.

Biosafety Level 3 (BSL3) Laboratory: A 2,178 sq ft BSL3 Biocontainment Facility is located on the fourth floor of the CVM Research Building. This facility is applicable to analyses and research in which work is done with approved select agents and other pathogens, which may cause serious or potentially lethal disease as a result of exposure by the inhalation route. The design and administration of the certified BSL3 Biocontainment Facility follows strict federal regulations with local oversight provided by the NCSU Institutional Biosafety Committee, a faculty director, and an experienced staff manager. Access to the Facility is restricted and all controlled substance areas are monitored by video cameras.

21.3.3.b. Describe the adequacy of classroom, laboratories and other instructional environments and related equipment,

Laboratories - Teaching:

- Laboratory B104 is used for teaching courses requiring microscopes (pathology, clinical pathology, microbiology, histology, parasitology). Additional microscopes were added when class size was increased from 72 to 76. Virtual microscopy and computing capabilities have also been added to this room.

- The anatomy dissection laboratory has a maximum capacity of 80 students, using current teaching methods. It includes a cadaver storage cooler and freezer, specimen preparation and storage rooms, and a live animal palpation room. Special air handling systems are provided. The floor and walls are designed for ease of cleaning. The location of the live animal palpation laboratory requires large animals (horses, cattle) be brought through the research surgery hallway. Because the flooring is not ideal, carpets are rolled over these floors for animals to walk safely into the laboratory.

- A modular laboratory (D235) provides facilities for teaching physiology, pharmacology, small animal surgery, large animal surgery and several selective courses. The laboratory is partitioned into 14 bays. Each bay is equipped with a ceiling mounted surgery light, medical gas and vacuum lines, physiography distribution station, storage cabinets, a work surface and a surgery table. Sound and closed circuit television systems are available. Surgical scrub sinks are in the center of the laboratory. The laboratory is located near an exit for bringing and removing animals from the laboratory, and is near the Laboratory Animal Resources Unit. In 1992, one-half of the laboratory was remodeled and an adjacent hallway was converted to animal housing quarters. This facility now conforms to MHA standards and allows neutering of animals from the local humane society with subsequent adoption ("Perfect Pet Program"). The ceiling has been replaced since the last accreditation visit to allow cleaning. One bay used for storage in this lab was recently converted to accommodate the new dentistry service.

- A small laboratory (C259) with capacity for 12 people is located adjacent to the Hospital clinical pathology laboratory and is used for instruction of students on the clinical pathology rotation.

- A small 600 sq ft laboratory/amphitheater is adjacent to the necropsy laboratory for gross pathology rounds with seniors, house officers and clinicians.

- A computer laboratory (C260) with 24 workstations is located in the Veterinary Teaching Hospital and is used in multiple core courses and selectives. Computers are on a three-year replacement cycle. There is currently no site with computer facilities that will seat half the veterinary class. The College has upgraded the wireless network to allow connectivity in teaching and common areas (all classrooms, the teaching hospital, commons areas, the cafeteria and the library).

Library: See Section 21.5.

Audiovisual Production: Biomedical Communications is housed in a suite of rooms that are designated for computer graphic design, photography, including film and paper processing, medical illustration, and television production. Two offices are used for administrative and client service activities. The facilities contain state of the art audiovisual equipment and, when supported by the technical and artistic skills of the staff, are capable of producing high quality educational audiovisual material.

Multimedia: Space is designated within the Veterinary Medical library for viewing multimedia programs in the slide-tape, videotape, CD-ROM, and interactive laser disc formats.

Classrooms and Seminar Rooms:

- There are two theater type classrooms, North and South, with a capacity of 96 and 117 persons, respectively. Each room is equipped with fixed writing surfaces and moveable seating. Electrical outlets are provided at each desk. Lighting is controlled from a master panel by the instructor and includes a variety of lighting options. The rooms are acoustically balanced and the public address system is seldom needed, even though one is provided with wired and wireless microphones. The North and South Theaters have networked Macintosh and PC computers linked to the projection systems. Large free-sliding chalkboards fill the front wall of each room. A ceiling mounted projection television can be used for in-room productions with videotapes or cameras; the system is operable from a centrally controlled studio signal. Each room is equipped for individuals with disabilities. The College does not have a room that is large enough for a gathering of the entire student population.

- There are two additional classrooms in the main building: one is a large flat-floored room (D239) with a capacity of 80 individuals. This room can be divided into two equally sized classrooms using a central partition. The second flat floor classroom (D236) has a capacity of 40 persons. Both rooms have the same audiovisual features as the theater-type classrooms. The flat-floor seating arrangement does have the disadvantage of sometimes hampering classroom discussion and student interchange.

- An additional small classroom is located on the first floor of the Research building. It has a capacity of 45 individuals.

- There are 11 conference/seminar rooms throughout the main building (A231, B222, B224, C221, D214, F253,) and research building (R294, R394, R494, R256, R356 and R458). These provide a capacity range of 10-30 persons for small group teaching or individual discussions. In addition, the library has five rooms with 4-person capacity (A 104, 105, 106, 107 and 108) and one with 15 seats (A103).

- Several of the rooms have been configured for interaction with students at distant locations. D239, D236 and A103 have cameras and screens for meeting participants to see and be seen by class or conference participants at other locations.

Computers: Six rooms within the main building have been designated for computing resources, including one office for computer personnel (C101); one environmentally controlled room (C290) that houses ten production level servers, a second smaller server room (D333) housing two servers supporting the Center for Chemical Toxicology Research and Pharmacokinetics (CCTRP) and the FARAD databank, a classroom for computer-based instruction/student lab (C260), a work study/computer lab within the library (A109) and a graduate student work study/computer lab (B104F). Computer laboratories with 24-hour key-card access include the student computer lab (C260) and the graduate student computer lab (B104). One room in the research building (R222) has been designated as a Disaster Recovery server room housing two production level servers, a two terabyte raid array and a four terabyte Network Attached Storage (NAS). Additionally, there are sixteen strategically located telecommunication closets for network connectivity throughout the main building and research building connecting to the University's network infrastructure via redundant fiber. Five outlying buildings are also connected via fiber to the network infrastructure including the Teaching Animal Unit (TAU) providing IP/Web Cam coverage within the animal stalls. Two additional outlying buildings are connected via wireless bridges. The main building has 100% 802.11G & 802.11A wireless coverage deployed via seventy-four access points. The research building has 75% wireless coverage. The Teaching Hospital is equipped with 290 desktop computers and 40 printers. Each desktop is configured to access the Hospital Information System (UVIS), the Clinical & Diagnostic Laboratory System (UVIS/LABS) and the Radiology Information System (RIS) that front ends the DICOM Based Image Management System (AMICAS).

21.3.3.c. Describe the adequacy of teaching hospital(s), pharmacy, diagnostic imaging, diagnostic support services, isolation facilities, intensive/critical care, necropsy, and related equipment.

The Veterinary Teaching Hospital (VTH): The VTH, at approximately 75,000 sq ft, is currently adequate in meeting the College's defined missions of clinical service, teaching, and clinical research. However, the caseload has grown dramatically over the past 20 years and the hospital is at its operational capacity, especially for

companion animals and horses. To address these important space issues, the CVM is in the final planning stages for a new companion animal veterinary medical center (see Section 21.3.5).

To address operational capacity issues for equine patients, the VTH has expanded its isolation facilities from three units to seven units, has converted a limited number of food animal stalls to equine stalls (as the demand for inpatient food animal services has declined), and is in the process of converting a small animal radiation room to an equine clinical area. In addition, some equine services (podiatry, theriogenology, and to a lesser extent, equine ophthalmology) have shifted a portion of their clinical activities to the Equine Health Center at Southern Pines since a large number of their equine patients are located in the Sandhills region of North Carolina.

Pharmacy: The pharmacy is adequate in size (1,147 sq ft) and well located in the center of the VTH, proximate to both the companion animal and large animal hospitals. Three full-time registered pharmacists, two part-time pharmacists, two full-time registered pharmacy technicians, and several part-time clerks are employed. The pharmacy is fully licensed by the North Carolina Board of Pharmacy and the NC Department of Human Resources Regulatory Drug Control and the Federal Drug Enforcement Authority. There is after-hours access, limited by proximity card assigned to the house officer on emergency duty, which is monitored by our security service. The pharmacy utilizes a unit dose approach to providing service insuring that medications are administered in a professional and efficient manner. In addition, there is a 2,000 line item formulary with services including 24-hour controlled substance dispensing module, sterile intravenous admixture service, oncology admixture service, nutrition support service, clinical drug research services, computerized patient medication profiles for inpatients and outpatients and a 140-volume drug information library. This pharmacy also actively precepts pharmacy students from the three North Carolina pharmacy schools during the 4th year of pharmacy education.

Diagnostic Imaging: The imaging center occupies approximately 4,700 sq ft The following rooms are contained therein: front desk area (reception), transcription office, radiology supervisor's office, conference/rounds room, a film/image viewing room, darkroom, ultrasound room, three radiography suites, one radiography/fluoroscopy suite, digital catheterization laboratory, nuclear imaging, computed tomography, and radiation therapy. There is one radiology supervisor, four radiologists with clinical responsibilities, four residents, seven technologists, three animal technicians, and one medical transcriptionist.

The radiology service is currently one hundred percent digital enabling real time images to be viewed at any computer located in the CVM but film is still available should the need arise. The radiology service has a well developed radiology information system (RIS) which provides for easy ordering of procedures, monitoring of procedure status, and archiving of images. The RIS works with the Picture Archival Communications System (PACS) so that clinicians can store and retrieve images in an efficient manner.

The University leases out 4800 sq ft of space adjacent to our Imaging Center to the IAMS Company, who operate a state-of-art, MRI center (1.5 tesla magnet) dedicated to veterinary patients. The center opened in August 2004 and is providing imaging services to the Veterinary Teaching Hospital for small animal and equine patients and researchers and regional veterinarians. Student involvement with the IAMS Center is substantial and includes opportunity for attendance and observations for VTH hospital patients needing MR imaging, and a one-half day rotation in the center during the 2-week radiology block. The students review an MRI safety video, which details the important safety issues associated with this technology. MR images, reports and a search function are available throughout the hospital in web format for review from any computer. Similarly, house officers have access to the suite and readily interact with imaging personnel. Radiology residents review cases daily with the duty radiologist and the IAMS suite is pivotal in their experience of MR imaging. Without this resource, radiology residents would need to do an externship to get the necessary exposure to MR. Every two weeks MRI rounds are held in the IAMS conference room. This is usually attended by radiologists, neurologists and radiology and neurology residents and the IAMS imaging personnel.

Clinical Pathology Laboratory: The clinical pathology laboratory occupies 1,176 sq ft, and employs seven full-time medical technologists and six part-time emergency/after-hours laboratory technicians. Clinical Pathology is primarily a teaching/service laboratory providing clinical laboratory testing (urinalysis, cytology, routine chemistries, hematology, blood bank, parasitology, and coagulation) for client cases in the VTH, and research cases in the CVM. The laboratory serves as a central receiving area for all "send-out" tests, i.e., tests that must be delivered to reference labs outside the VTH. Routinely, samples for 160 different tests are sent to at least 45 reference laboratories.

Clinical Microbiology Laboratory: The clinical microbiology laboratory consists of one main laboratory area (approximately 400 sq ft) and one shared preparation/autoclave room. Its primary goal is to aid in the diagnosis of diseases caused by bacteria and fungi in patients of the VTH. It also accepts samples from Laboratory Animal Resources, individual researchers, and outside veterinary practitioners. The laboratory is staffed by two full-time medical technologists who oversee its daily operations, and whom are directed by a DVM, PhD microbiologist. All members of the staff routinely consult with clinical faculty and students regarding microbiological problems.

The clinical microbiology laboratory additionally coordinates the routine nosocomial sampling program of the Hospital and maintains information about antimicrobial-resistant bacteria cultured from Hospital patients. The benefit of this program has been the availability of information regarding resistant organisms for immediate nosocomial control.

Clinical Pharmacology Laboratory: The clinical pharmacology laboratory is a 319 sq ft laboratory unit staffed part-time by a medical technologist responsible for the daily operations of the laboratory, under the direction of a board-certified clinical pharmacologist. The laboratory utilizes fluorescence polarization immunoassay and UV spectroscopy to measure drugs and hormones in blood or plasma of animal patients. Additionally, the laboratory provides pharmacokinetic analysis and interpretation, and individual patient consultation in a wide variety of animal species, both within the VTH and to regional veterinarians.

Histopathology Laboratory: The histopathology laboratory occupies a 1,250 sq ft unit laboratory and is staffed by 4.5 FTE histologists and one clerk. Services include routine paraffin and soft tissue plastic processing, embedding and sectioning of decalcified and nondecalcified biomaterial/bone specimens, specialized frozen sections, immunohistochemistry, enzyme histochemistry and nonradioactive in-situ hybridization

Intensive Care Unit: The new Small Animal Intensive Care Unit (ICU) opened in 2006. The 800 sq ft area is directed by a staff supervisor in conjunction with two faculty members from the Department of Clinical Sciences, and is staffed by six full time registered veterinary technicians and five full time veterinary assistants. The veterinary technicians provide 24-hour care, 365 days a year. This service not only provides a major learning experience for interns but provides a unique opportunity to study methods of diagnosis and care of painful or critically ill animals. The unit contains four oxygen/environmental control cages, ten electrocardiogram/direct blood pressure monitors, three ventilators, a defibrillator/pacing unit, an indirect blood pressure monitor, numerous fluid administration pumps, a peritoneal dialysis unit, and other equipment. The equine hospital does not have an area solely dedicated to critically ill horses, rather they are managed in specially upfitted stalls in a single aisle of the large animal hospital.

Necropsy Laboratory: The necropsy laboratory occupies 1,725 sq ft and contains one hydraulic and three stationary stainless steel tables. In addition there is a 90 sq ft photography room; two 90 sq ft offices with microscope, desks and computer; two connected walk-in coolers (1,020 sq ft) for holding animal carcasses and disposable refuse, a 600 sq ft amphitheater, and 520 sq ft of adjacent locker rooms with showers and lavatories for men and women.

Equipment for these and all services within the VTH are prioritized and purchased annually through a through a well developed process administered by the Hospital Board. In addition, the Hospital utilizes a funded depreciation approach to set monies aside for the replacement of older equipment.

21.3.3.d. Describe the facilities for maintenance of teaching and research animals,

The NCSU CVM is accredited by the Association for the Assessment and Accreditation of Laboratory Animal Care International (AAALAC). The CVM Laboratory Animal Resources (LAR) unit is an administratively centralized service unit with husbandry, veterinary care, and oversight responsibilities for research and teaching animals at the CVM. LAR directly manages animal holding facilities in one wing (F-section) of the main CVM building, plus 12 adjacent buildings (five “Finger Barns,” the Hog Barn, Turkey Barn, Fish Facility I, Dog Facilities I, II, and III, and the Research Building Vivarium), and approximately 20 acres of pasture.

The Central Procedures Laboratory (CPL) is located in the D-section of the CVM building. The CPL is a fully equipped experimental surgery unit with operating rooms for small and large animal surgery and associated support areas. It has specialized experimental rooms for short-term use, controlled environment rooms, and radiographic services for research projects.

The Teaching Animal Unit (TAU), located adjacent to LAR outbuildings and comprising much of the CVM campus, has been designed and is operated to provide veterinary students with live large animal laboratory learning experiences. The TAU program includes horses, cattle (both beef and dairy), swine, poultry, sheep, goats, and a pair of llamas, maintained in herds and flocks similar to agricultural production units.

The Equine Health Center (EHC), located in Southern Pines, NC, has a number of functions within the CVM, including CEM import quarantine, equine reproduction, ophthalmology, podiatry and rehabilitation, diagnostic testing services, and a remote site for equine research animal donations ("Homeless Horse" program).

Fish Facility II houses a variety of fish and invertebrate species, the majority of which are ornamental (pets and display species). Areas of research focus include: pharmacokinetics, analgesia and anesthesia, surgery, infectious diseases, clinical trials involving new drugs and compounds, and nutritional studies.

The Oyster Barn was so-named because it started as an invertebrate facility, primarily for fresh water mollusks; there are now IACUC-approved protocols for housing small numbers of fish.

The Wild Bird Center is a small facility on the CVM campus used twice a year for 1-2 week "raptor labs."

CVM faculty participate in collaborative research projects which involve animals maintained at the NCSU University Field Laboratories (UFL) in Raleigh and throughout the state. In each of these cases, animals are owned by the UFL/College of Agriculture and Life Sciences. CVM faculty provide clinical care for most of these units, and students may visit them as part of senior rotations.

The CVM VTH is occasionally utilized for clinical or emergency procedures in research animals, and there are approved protocols for teaching use of large animals in the large animal clinic, and research projects that utilize the imaging facilities. A number of clinical trials utilizing patient animals are conducted in the VTH, and there is currently one dog maintained in the VTH for teaching purposes.

Most of the surgical training for veterinary students is through the "Perfect Pet" program, in which shelter/rescue group dogs and cats are neutered in the CVM Clinical Skills Laboratory (D235), under supervision of CVM faculty. The Clinical Skills Lab is used for student surgery classes, as well as a number of other teaching activities involving animals.

Animal holding areas have been generally adequate in quantity and quality to meet needs for research and teaching animal use, with some qualification as noted below. The new Research Building Vivarium, which opened in early 2006, is an outstanding facility that provides state-of-the-art housing for a variety of species, although focused on rodents.

Heating, ventilation, and air conditioning (HVAC) systems of the entire CVM are undergoing major refurbishing that will continue for the next several years. The LAR Main Building facility is currently under renovation, and plans are in progress for similar HVAC work in the LAR Finger Barns. These upgrades will substantially improve temperature and humidity control in animal holding rooms, and add emergency back-up power for the HVAC systems.

There has been a continual struggle to keep up with recurring problems of peeling/chipping paint in some animal rooms. Much of this problem is attributed to poor moisture control within buildings, and will be addressed as part of the HVAC renovation projects.

LAR "outbuildings" (i.e., the small animal housing facilities other than the Main Building, Finger Barns and Research Building Vivarium) are generally adequate to accomplish their intended purpose, but do have aging systems that will deteriorate over time. We have approval for an extensive renovation of the Hog Barn, which will be completed this Fall, and are in the planning stages for HVAC upgrades to Dog Facilities I and II. Future CVM planning efforts will address long-term animal housing needs currently accommodated in these buildings.

The quantity of pasture space will decline with continued development of the Centennial Biomedical Campus and addition of the new small animal medical center; lost pasture space will impact research animal housing and the TAU, as well as the VTH. The CVM will maintain an active planning committee to recommend ways to optimize use of existing pasture space and plan for these trends. Much of the decline in pasture space may be offset by acquisition of land adjacent to the existing CVM footprint.

21.3.3.e. Describe the adequacy of research facilities and equipment,

Research laboratory space is distributed along department lines. A portion of the research laboratory space was reserved and equipped to create a Central Research Facility that would promote efficient and economical use of specialized equipment and space. The research laboratory space is excellent and well equipped; however, growth in the research programs and newly implemented safety regulations that prevent use of hallways for equipment, e.g., ultrafreezers, have exacerbated our shortage of space. The ultra low freezers that were kept in the hallways of the CVM were moved to the rear of one of our Laboratory Animal Resources (LAR) animal holding facilities, but there are plans in progress to return this space shortly to animal housing. The College leases 4,800 sq ft in the Pylon Industrial Park and will continue to utilize this location for research and office space..

A new four-level research building (100,000 sq ft) was dedicated in 2005. The first level is dedicated to an animal care area and mechanical space. The second level is dedicated to respiratory, allergy and cell biology research. The third level is dedicated to genomics and cancer biology research. The fourth level is dedicated to infectious disease and immunology research. This level also houses two Biosafety Level 3 (BSL3) laboratories (see above).

A complete listing of CVM equipment will be available for review on-site.

21.3.3.f. Describe the adequacy of administrative and faculty offices

Administrative Offices: The administrative suites contain the offices of the Dean, the three Associate Deans, the three Department Heads, and their support staff. Adjacent to these areas is the College Business Office. These offices are well situated and equipped with state of the art communication systems (telephone, facsimile, and networked computer systems).

Faculty Offices: In the main building there are 84 rooms designated for faculty offices that average 120 sq ft each. The new research building has 36 faculty offices. All offices have windows and modular furniture. All offices are carpeted. Research associates, graduate students, and some of the house officers are officed in groups of eight. A portion of the student laboratory (B 104 South end) was converted in 1999 to provide office space for residents and graduate students. The need for office space was underestimated when the main building was constructed. Therefore, additional office space for faculty, house officers and graduate students led to construction of the Annex and leasing of the Pylon Drive Research Laboratories. Despite these improvements, available office space remains insufficient to accommodate visiting scientists, emeriti professors, adjunct professors, house officers, graduate students, and certain support personnel performing key operational duties. No offices are available for new tenure-track faculty, except on a shared basis. Temperature control is a problem in many areas of the College, including offices.

21.3.3.g. Describe the adequacy of service areas for students (for example, lounges, cafeteria, etc.)

Locker space needs were underestimated when the main building was constructed. Therefore, additional lockers have been purchased and installed in the various hallways of the main building. Students do not have convenient facilities for changing clothes, cleaning work boots, and storage of personal items. Since the last accreditation visit, a student locker area has been added in the first barn for student use before Teaching Animal Unit classes. The two commons areas (Blue and Green Commons) were recently upgraded with new carpet, new furniture (including comfortable chairs with pull-out tables for notes or computers) and improved wireless access. Tables and chairs were also added to the patios. One room in the main building has been designated for the SCAVMA office and an additional room in the library has been designated for SAVMA Symposium planning. Numerous large lockers have also been purchased for use by student clubs.

21.3.3.h. Describe the adequacy of building infrastructure (for example, air handling, vented hoods, etc.).

The CVM campus includes a number of buildings of various ages and construction types. The adequacy of each building for its current use varies considerably from state-of-the art to barely adequate. There are a number of efforts underway to address buildings with serious defects.

CVM Main Building: The main building is approximately 300,000 sq ft and was completed in 1982. The air handling and electrical systems are outdated and much of the building infrastructure is beyond its useful life. Consequently, a $15 million dollar HVAC and electrical renovation is currently underway to upgrade these systems with a targeted completion Summer of 2007. The renovations will include increased normal and emergency power capacity, increased ventilation and exhaust rates, digital environmental controls, duct cleaning and automatic fire sprinkler system. The renovation includes upgrading Laboratory Animal Resources and other animal holding areas to meet AAALAC standards. The main building has adequate exhaust for critical areas such as chemical fumehoods, autoclaves, pharmacy, necropsy, anatomy, etc.

CVM Research Building: This 100,000 sq ft facility is brand new and is state-of-the-art for all systems.

CVM Finger Barns: The Finger Barns house part of Laboratory Animal Resources and include holding areas for research animals such as horses, cattle, dogs, cats, birds, pigs, rodents, and fish. These facilities are out of date for their current use and their infrastructure is aged.

CVM Energy Plant and Utility Tunnel: The main building and the new Research Building are served by a central energy plant which generates high-pressure steam and chilled water. These utilities are supplied through a large underground, fully walkable tunnel. The tunnel and associated utilities were completed in 2004 and are sized to accommodate the full campus build-out as shown on the current master plan. The energy plant has redundant boilers and chillers to provide continuous and reliable operation.

Equine Health Center at Southern Pines: This facility is 4,883 sq ft and was completed in the early 1970s. It includes offices, a research lab, an equine treatment room, an equine surgery, four buildings for research animal housing and adjoining pastures. Recent improvements have been made to increase the number of pastures and efforts are underway to secure funding for building infrastructure improvements.

Pylon Industrial Park: The CVM leases 4,800 sq ft of space at Pylon Industrial Park for research laboratories. These labs are located less than 1 mile from the main CVM campus. Building infrastructure is sufficient and is maintained by the lessor.

Other Facilities: Other facilities on the CVM campus include the Administrative Annex, Teaching Animal Unit buildings, outlying Laboratory Animal Resources buildings, and a modular building for supplemental office space.

21.3.4. For safety and educational purposes, protocols must be posted in the isolation facilities and the facilities must be used for instruction in isolation procedures (biocontainment).

There are protocols regarding biocontainment and management of infectious disease outlined in the Infectious Disease Manual, which is available online for students, faculty and staff to access at any time. In addition, an Infectious Disease Committee reviews these protocols and makes recommendations to the Hospital Board. Prior to working in the VTH, all individuals must complete and pass an Infectious Disease Test, which covers the material in the infectious disease manual. There are specific isolation facilities for small and large animal patients.

Small Animal: The small animal isolation unit is located between the ICU and small animal emergency service and its use has increased with the implementation of the small animal emergency service. The layout of the unit is less than ideal, as it does not lend itself to easy monitoring or segregation of patients. This is one of the units that will be expanded in the planned new small animal hospital so that each patient will have its own isolated cage, allowing four patients to be housed at once. Protocols for use of this room are prominently displayed on the entry door.

Large Animal: The isolation unit (IU) is separate from the hospital, and consists of seven stalls each having its own anteroom for supplies, equipment, and changing. Three of the stalls were built in 2003, and are utilized prior to the four stalls (two pairs of two stalls) that were part of the original infrastructure. There are specific criteria for immediate admission of an animal to the IU, for transferring hospitalized animals to the IU, and for use of the IU. One of the older IU stalls has a head gate and bars for handling a bovine. Protocols for use of these units are prominently posted on each entry door.

21.3.5. Describe current plans for improvement.

The Randall B. Terry Jr. Companion Animal Veterinary Medical Center: The most substantial near-term facility change for the CVM will be completion of the Randall B. Terry Jr. Companion Animal Medical Center (Terry Center). The Terry Center will be 105,000 sq ft (approximately twice the size of the current small animal teaching hospital) and will enhance our faculty and staff's ability to teach professional students and house officers, provide clinical service and conduct clinical research. Highlights of the plans include a separate and specifically designed pavilion for each specialty service (each with instructional space for students and house officers in the form of large conference rooms), an expanded and more usable isolation unit, additional cage capacity, and more storage space. In addition, state of the art technology will be incorporated into the Terry Center to insure that the patients receive the highest quality and most advanced veterinary medical care. Forty faculty offices and cubicle space for 35 house officers are planned. The programming and design development phase for the Terry Center has recently been completed, and the documentation phase (generation of construction documents) begins January 2007. Pending final funding approval, groundbreaking is anticipated for early 2008 and the Center is scheduled to open late 2009. In addition to construction of the Terry Center, the project includes designing a new Campus "Hearth" with a new College entrance, ample open space with large outdoor gathering areas and outdoor "classroom" spaces, a campus walking path, Coffee Shop, re-routing of William Moore Drive, and the construction of a 550-car parking garage. The budget for this comprehensive project is projected at $72 million.

Existing Companion Animal Hospital Renovation: Relocation of most small animal specialty services to the Terry Center will vacate approximately 50,000 sq ft of existing hospital space. The programming phase for the current small animal hospital is planned for early 2007. The CVM anticipates it will use this space to develop a companion animal "Outpatient Center" including exotics/special species, behavior, dentistry, small animal reproduction, nutrition and an expanded wellness clinic. Renovations will also likely include additional instructional space including a 110-seat classroom, conference rooms for small group learning, and cubicle space for large animal house officers. The CVM Clinical Pathology Laboratories will also be expanded to handle the anticipated volume increase.

Large Animal Hospital: The Campus master plan includes construction of a new 52,000 sq ft Equine Medical Center on the north end of the campus, followed by renovation of the existing large animal hospital to a food animal disease investigation center. Private fund raising for both of these projects is planned, but a timeline for procurement of these funds is uncertain. As a result, the College is exploring options to expand our large animal hospital over the next five years as an interim step. Planning efforts for this expansion are set to begin in Summer 2007.

Main CVM Building: The main building is currently undergoing a $15 million HVAC and electrical renovation which is scheduled to be complete in Summer 2007 (see section 21.3.3.h). The main building also recently activated a wireless network allowing wireless access to the campus Ethernet system and the web.

CVM Finger Barns: A $4 million project to renovate the HVAC and electrical systems in the Finger Barns is currently in design and is targeted to begin construction in 2007. The project will include new air handling systems to comply with AAALAC environmental standards. Also included is a new emergency generator to provide 100% electrical back-up and improvement to interior finishes for easier cleaning.

Campus Infrastructure: An $8 million campus infrastructure project is currently in design to support the new companion animal hospital and provide for additional campus growth opportunities. This project includes additional boilers and chiller in the energy plant, a new sanitary sewer main to the City of Raleigh system, additional campus electrical capacity from Progress Energy, and new underground utilities.

Additional Campus Growth: Planning is underway for a new 75,000 sq ft "partnering" building. The partner building will provide additional opportunities for collaborative relationships with private enterprise under the Centennial Campus model. Preliminary discussions are taking place with state officials of the possibility of locating a new 200,000 sq ft State Health Laboratory Building, which if realized would provide exciting collaborative opportunities for our faculty, house officers, and students.

21.4. Clinical Resources

21.4.1. Complete Tables A, B, and C for the past five years and analyze trends for each species (category).

See Appendix 4-1 for Tables A, B, and C. Canine, feline, and equine case accessions in the Teaching Hospital have steadily increased (13.6%, 13.9% and 22.2% increase, respectively) from 2001 to 2006. Number of hospitalized days has increased proportionately for these species. In-house food animal case accessions have decreased modestly over the same time period (-26.6%) owing largely to the decreasing demand for individual food animal medical services, and increasing urbanization of the Triangle region surrounding NC State. Small ruminant case hospital accessions have increased 13.6%-57.5% (depending on species) over the past five years, reflecting a continued but modest demand for individual animal medical services in these species. The low number of pet bird accessions since 2004 are the result of closure of our in-house pet avian/reptile/exotics service in 2004. Students are instructed in these species off-site (see section 21.4.3). Ambulatory/field service bovine accessions decreased in 2002-2003, and over the five year reporting period as a result of closure of one of the area's State Dairies. The dramatic increase in porcine and "Other" (poultry) field service cases accessions/animals examined in 2005-2006 reflect more accurate record keeping on the part of our swine and poultry faculty in documenting their field trips. In other words, we feel the case accession data for 2005-2006 accurately reflects the number of "at-risk" animals involved in poultry and swine operations field service visits. These data reflect "at-risk" animals (i.e., number of animals in the specific production facility (e.g., poultry house) at the time of the visit, rather than the number of individual animals examined. We cannot retrospectively confirm the number of animals "at risk" for prior years.

21.4.2. Describe and analyze the adequacy of normal and clinically diseased animals (hospitalized, out-patient, field service/ambulatory and herd health) used for the DVM teaching program.

Within the VTH, students are exposed to a large and growing number of diseased dogs, cats and horses through our specialty (referral-oriented) services including companion animal internal medicine, soft tissue and orthopedic surgery, dentistry, dermatology, ophthalmology, cardiology, neurology and equine internal medicine, soft tissue and orthopedic surgery. As the companion animal hospital operates on a referral basis, these cases are considerably more complex than those encountered in routine general practice. The College has broadened the student exposure to normal and "primary care" companion animal cases through our shelter medicine/community practice programs, companion animal wellness clinics (see section 21.4.3), and structured externship programs. While the equine hospital also operates on a referral basis, the complexity and drift away from "primary care" type cases has not been as profound as with companion animals. Equine ambulatory/field service calls to a state prison and structured externship experiences are used to provide additional primary care instruction. The closure of the in-house pet avian/reptile service in 2004 has been mitigated by developing off-site instructional opportunities (see section 21.4.3). While in-house food animal accessions have remained relatively modest, considerable instructional opportunities exist on off-campus sites through our field service/ambulatory programs and externship opportunities.

21.4.3. Describe unique clinical educational resources or programs that enhance the educational mission.

Community-Campus Partnership (CCP) Program: Created in 2000, the CCP Program serves the needs of our veterinary students and the Wake County Animal Care, Control and Adoption Center, which shelters more than 10,000 animals annually. The bipartite mission of CCP program is to equip the next generation of veterinarians with community-oriented competencies necessary to practice in a changing veterinary environment and to make a difference in the lives of their clients and the diverse communities they serve. To achieve this goal, this clinical training program aims to increase primary care opportunities for students to practice routine surgical procedures and to diagnose and treat common diseases of dogs and cats in the Wake County Animal Care, Control and Adoption Center. Two full time faculty supervise fourth-year veterinary students (70 students each semester) on two-week clinical rotations at the Center as part of VMC 970 – Community Classroom Experience in Companion Animal Practice. Additional clinical opportunities associated with the CCP Program include serving shelters in rural North Carolina counties with the Mobile Surgery Hospital and providing preventative care for service dogs in the NC Department of Corrections.

Zoological Medicine Program – Clinical Aspects: Zoological medicine disciplines at NC State include exotic animal private practice, aquatic animal medicine, wildlife medicine, and zoo practice. These combine many elements of veterinary medicine, including preventative medicine, population medicine, clinical medicine and surgery, pathology, ecosystem health, regulatory compliance, facilities and personnel management, and research. Six CVM faculty, three zoological medicine residents, and more then 10 active adjunct faculty provide a variety

of elective clinical experiences for interested students. Clinical training in zoological park and wildlife medicine is offered via four-week rotations (VMC 989) at the North Carolina Zoo. Experience in exotic animal clinical medicine is offered in a senior year clinical course (VMC 988) that combines work with CVM faculty and rotations in private exotic animal practices. Colonies of companion birds and reptiles are maintained in Laboratory Animal Resources facilities to assist student training. Students can complete rotations focused on wildlife rehabilitation at the NC Zoo (VMC 998) and Piedmont Wildlife Center (VMC 996); the CVM Turtle Team provides ongoing experiences in rehabilitation of turtles (credit available in VMC 928). Rotations in aquatic animal medicine (VMC 987) and sea turtle health management (VMC 950) are also available. In addition to CVM based courses, extramural experiences at other zoological facilities, wildlife field studies and private practices are encouraged (VMC 921 & 963). Experiences in international zoological medicine are available through the Veterinary International Field studies course (VMC 999).

Clinical Zoological Medicine is currently supported in the VTH through the field services unit and underclass and senior students are often included in these endeavors. A clinical contract with the NC Museum of Natural Sciences allows for 24 annual field service visits (and periodic VTH admissions). The field service unit also supports clinical efforts at the three NC Aquariums, Karen Beasley Sea Turtle Hospital, Center for Marine Sciences and Technology, NC Wildlife Resources Commission, Bass Pro Shops Inc., Rocky Mount Children's Museum, and other large-scale clients across the state. Although a comprehensive exotic animal practice does not currently exist in the VTH, a full service practice is planned following completion of our new specialty veterinary hospital.

Veterinary Behavior Program: Veterinary behavior is a growing specialty at the CVM. Prior to 2005, NCSU was one of the few veterinary colleges in the United States that required of all veterinary students a course in animal behavior (VMC 927), "Introduction to Companion Animal Behavior," taught by a board-certified veterinary behaviorist. In 2005, a veterinary behavior specialist joined the CVM faculty as part of the Animal Welfare, Ethics and Public Policy Program. In addition, a new selective course, "Animal Behavior and Welfare," was added to the curriculum. Currently, a three-year program to develop clinical behavior services is underway. In 2006, the CVM approved a residency-training program in veterinary behavior that will lead to board certification by the American College of Veterinary Behaviorists. Later this year, a behavior consultation service for VTH inpatients (companion animals and horses) will be implemented as part of the residency-training program. Limited behavior services for companion animal outpatients will begin in 2007.

Companion Animal Wellness Clinic: Initiated in 2004, this clinic is held biweekly on Saturdays in the Teaching Hospital. The service (vaccination and other routine health care) is offered to students, staff, and faculty at the College, and is staffed by a veterinary technician, third year professional students, and a senior house officer (generally internal medicine). Appointments are offered every 30 minutes, with ample time for students to perform and practice history taking, physical examinations, and planning of vaccination protocols. Though these are well animals, they frequently present with other "primary care" problems, and provide an excellent instructional experience to the student under a low-pressure system. The VTH plans to expand this service.

Field Service/Ambulatory and Herd Health: Like many Colleges of Veterinary Medicine in urban areas, the caseload in the Veterinary Teaching Hospital for food animals is modest, and has decreased over the past five years. The primary focus of food animal instruction in the 4th year of the DVM teaching program is for students participating in elective rotations through the Field Services section of the VTH under the direction of faculty in the PHP Department. A variety of clients are engaged, including university College of Agriculture/University Field Labs, state Department of Agriculture and Consumer Services, commercial swine and poultry operations, and privately owned and operated farms. DVM students have exposure to large and small ruminants through a 4th year rotation which combines in-hospital services for clients and referring veterinarians with field services calls, many of which are programmed herd work. Bovine, caprine or ovine farms calls have varied between 226 and 368 over the past five years, with 8,000-15,000 animals examined.

With few exceptions, the swine and poultry operations are corporately owned, most with their own in-house professional veterinary consultants. Through cooperation and collaboration with these veterinarians, numerous opportunities are available for our students under the supervision of our faculty. Increasingly, these calls are requested by company veterinary staff members who rely on the expertise of the College's faculty. Improved recording efforts on the number of animals examined documents that our faculty and students made over 260 ambulatory calls in these areas involving over 280,000 "at-risk" animals.

Teaching Animal Unit (TAU): The TAU is a teaching facility located on the CVM campus, which houses a wide variety of food and farm animals. It is operated as an onsite production farm. Veterinary students gain valuable experience in the day-to-day management and preventative health care of beef and dairy cattle, swine, horses, turkeys, broiler chickens, goats and sheep. The TAU animals provide the foundation for teaching six required semester courses (Health Maintenance and Animal Production I, II, and III) taught to students in each semester of their first three years of the professional curriculum. Through live-animal laboratories, the TAU provides an opportunity for students to develop confidence in handling and managing various farm animal species and to develop an understanding and clinical competency in production management, preventative health care, diagnostic techniques, food safety, housing, biosecurity and animal welfare. One hundred and fifty-five live-animal laboratories are taught annually at TAU. Each class of approximately 76 students participates in laboratories in each of the animal species every semester. A faculty director oversees the management and health care of the entire unit with the support of a unit manager and four technicians. The TAU animals are also used to support the teaching in selective courses, graduate courses (4) and in fourth year food animal and equine clinical rotations. Four clinical residents in poultry and ruminant medicine have weekly interaction with TAU animals. The entire operation of the TAU is based on providing the opportunity for students to learn and understand the farm animal management and preventive health care, while acquiring must learn skills in each of the TAU species prior to progressing to their clinical year.

The TAU is located adjacent to the main CVM building on 80 acres subdivided into 26 lots and smaller pastures. TAU maintains two confinement operations for swine and poultry. The swine farrow to finish operation has three confinement buildings that utilize 4,566 sq ft of space. The poultry confinement building utilizes 5,600 sq ft. A sheep and goat barn utilizes 4,725 sq ft. There are two large barns, one for horses and one for dairy cattle. Both the dairy cow and horse barn have 5,292 sq ft. The horse barn contains 12 stalls. The dairy cattle are fed in ½ of the dairy barn. A beef shed where beef labs are performed utilizes 3,500 sq ft. The horses, beef cattle, dairy cattle, goats and sheep also use approximately 70 acres of pasture. There are 11,876 sq ft of supplemental open sided pasture shelters and feeding stations. TAU maintains an off site non-milking dairy herd that are pastured on 28 acres.

TAU maintains and operates a USDA Grade A Dairy, inspected by the NC Department of Agriculture. There are, on average, 18-20 milk cows, 3-5 dry cows, and 4-6 replacement heifers maintained yearly. The dairy cows produce 18-20 calves per year. There is a swine farrow to finish confinement operation that houses 34 sows, 10 replacement gilts and 3 boars. The swine unit maintains approximately 125 nursery and feeder pigs at any one time for student instruction. The 22-cow beef herd produces 15-18 calves annually. The cross-bred sheep flock of 22 ewes produces 35-40 lambs annually. Likewise, a breeding goat herd of 20 meat type goats is maintained producing 23-28 kids annually. Finally, of the 28 quarter horses, 4-5 are bred to produce foals. An offsite (one mile from CVM) non-milking dairy herd of 22-25 cows is maintained and used to supplement certain student laboratories.

Equine Health Center at Southern Pines (EHC-SP): This off-campus satellite clinical operation is located on 87 acres approximately one hour from the CVM. Active clinical services located at this facility include an equine theriogeniology program offering embryo transfer, artificial insemination, and other advanced breeding techniques (very active during the horse breeding season); a Contagious Equine Metritis (CEM) quarantine program, an outpatient equine podiatry clinic (1 day/week), and an outpatient companion animal and equine ophthalmology clinic (2 days/month). The Center also offers diagnostic laboratory services to regional veterinarians. Professional students and house officers are integrally involved in these services through senior year rotations or assigned duties. The center has a facilities manager, three full time and one part time staff members, and a faculty director who provides oversight. The CVM plans to increase the clinical service activities at the EHC-SP over the next five years, including additional pasture and paddock space, and construction of a 12-stall barn with clinical facilities.

21.4.4. 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.

Not applicable.

21.4.5. Describe the involvement and responsibilities of professional students in the healthcare management of patients (and clients) in clinical programs of the college.

The involvement and responsibility of students in the healthcare management of patients and clients in the clinical programs of the College vary somewhat among the specific services and type and complexity of the case. For companion animal, equine, and food animal non-emergency referral cases, students typically are responsible for history taking and physical examination, developing a differential diagnosis list, diagnostic and therapeutic plan, and discussing this list/plan with a house officer or faculty member. Students are present when informed consent and financial discussions are conducted by the attending clinician. For hospitalized cases, students assume primary responsibility for care and evaluation of hospitalized cases. They are responsible for some of the nursing care, and order and submit appropriate diagnostic tests. Under the supervision of staff and clinicians, students perform routine technical skills such as venipuncture, cystocentesis, catheter placement, fine needle aspirates and biopsy collection, bone marrow aspirates, etc. Students assist or observe in more complex, invasive, or advanced procedures such as many surgical procedures, endoscopy, cisterna magna taps, joint injections, sophisticated imaging studies, etc. The extent to which students actively perform other, more complex diagnostic, surgical, or therapeutic task varies according to the case complexity and perceived competency of the student, and is largely at the discretion of the attending clinician.

Students are responsible for daily (or more frequently if appropriate) physical examinations and monitoring of the patient, and daily progress notes and other medical record notations using the "SOAP" methodology. Students are actively involved in client communication, and for some services, communicate with the referring veterinarian. Students routinely compose a client/referring veterinarian discharge summary, and generally have the responsibility to discharge the patient and discuss instructions and the follow-up care and plans with the client. In service rounds, students are expected to actively participate in the decision-making process and formulation of diagnostic and treatment plans. All aspects of student involvement in case management processes are closely supervised by staff, house officers, and clinical faculty. A similar approach is taken with students involved in ambulatory/field service food animal services, although the extent to which students participate in "hands-on" activity is greater. Students participating in the Community Practice/Shelter Medicine and Companion Animal Wellness Clinics have considerable more opportunity and responsibility in "hands-on" activity and perform a greater number of technical, diagnostic, and surgical tasks. The responsibilities of students participating in services without primary patient care responsibilities (Clinical Pathology, Necropsy, Microbiology, Anesthesia, Radiology) vary according to the service, but all have direct faculty oversight. For example, students perform complete necropsies under the supervision of a pathology faculty member or resident. In anesthesia, students are responsible for formulating an appropriate anesthetic and monitoring regime, placing cephalic catheter and endotracheal tube, and monitoring of the patient until extubation. Radiology students are responsible for learning the technical aspects of imaging techniques, and interpreting normal and abnormal imaging studies under the supervision of faculty and residents.

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

Subject matter experts including clinical faculty (the large majority of which are board-certified in their discipline) house officers (particularly second and third year), and professional nursing staff members, are integrated into the clinical instruction by direct supervision and oversight of the students engaged in the process described in 21.4.5. Most services conduct daily rounds and case discussions that include faculty, house officers and students. Some services conduct both morning (topic-oriented) and evening (case-oriented) rounds discussions. Two experienced emergency veterinarians with extensive experience in private emergency clinics staff our companion animal after-hours emergency service. Content specialists from private practice are routinely used in selective course offerings, pet avian rotations and selectives, zoologic medicine rotations, and approved externships.

A wide variety of resources (case material) is available for clinical instruction from animals and clients of the teaching hospital, ambulatory services, animals in the Teaching Animal Unit, Wake County Shelter and Equine Health Center at Southern Pines, and cases seen on externship. Case material is frequently and actively incorporated into didactic lecture and laboratory presentations in the pre-clinical years.

21.4.7. Describe the adequacy of the medical records system used for the hospital(s).

21.4.7.a. 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.

The VTH utilizes a unit record concept (one number per patient) and the POMR (Problem Oriented Medical Record) format for documenting clinical information concerning inpatients, outpatients, and field service activity. The unit record approach centralizes the complete 'hard copy' historical and clinical summary information and promotes both efficiency in access and information utilization. Field Service/Herd Health

records follow the same concept; the only exception being that the entire herd has one (1) unique medical record number. All information pertaining to an 'aggregate herd/flock/school' designation is filed within the herd record. Individual trip call record sheets identify problems with a specific animal.

The Teaching Hospital Information System (THIS) billing application for medical record information i.e., billing/client/patient demographics was utilized from 1985-2003 utilizing Cognos' PowerHouse. UVIS (Universal Veterinary Information Systems) was implemented in July 2003 and consists of an Oracle database and Oracle forms front-end. Patient/client demographic information is contained within UVIS-Universal Veterinary Information System. All ancillary lab report data and is captured within the 'core' elements of UVIS. We have been involved with UVIS, the Ross group and the other schools using UVIS since the middle of 2001. We are currently discussing moving up to a web capable version of UVIS, tentatively scheduled for release late in 2007. The clinical faculty and our Information Technology department will evaluate a new electronic medical record module of UVIS in 2007, and we anticipate the need for a new electronic medical record system of some type by late 2009, the projected date of completion of the Terry Center.

The data stored in the UVIS and old hospital system is available to the CVM community via browser-based applications. These applications are used on a regular basis by students and faculty for studies. When the search is too complicated for the search tool, the Hospital Information System liaison or a member of Computing Resources assists. The medical record group also does occasional record searches, about 50 per year. There are also daily requests for data on a walk-in basis in the medical records area. Additionally, medical record data is captured via SNOMED (Systematized Nomenclature of Medicine and Veterinary Terms) and the implementation and application of the Veterinary Medicine Database (VMDB) Program's external abstract and web-based search tool VVDEA (VMDB's Veterinary Data Entry Application). The VMDB is the veterinary schools' data consortium/clearinghouse, residing at University of Illinois. The end-user may also utilize this database to conduct a more refined internal or external data search. With the aforementioned combinations of data search capability, the end-user has a sophisticated array of tools to conduct concurrent and retrospective studies.

21.4.8. Describe how the college has responded to increasing/decreasing clinical resources.

The referral caseload (and therefore instruction material available for our students) has shown steady growth in our companion animal specialty services, and equine services. The College has responded to the need for companion animal "primary-care" cases through implementation of a wellness clinic, community practice/shelter medicine program, and increased number of externship opportunities in area private practices. The College has responded to the increased number of referral companion animal and equine cases by dramatically increasing hospital-based technical staff, increasing house officers (from 38 in year 2000 to 61 in 2007), and clinical faculty. This has largely been accomplished through hospital based revenue generation rather than state-appropriated resources. The most deficient resource in the VTH, particularly in the companion animal hospital, is space. The College has responded to this need through planning for a new hospital and renovation of the current one. We have responded to closure of the avian/reptile service through off-campus instruction opportunities described in 21.4.3. Decreasing or static in-house food animal case accessions, and closure of a local state-owned dairy herd used in our teaching programs have been mitigated by developing additional ambulatory/field service opportunities and developing relationships with state food animal practitioners and farms with case material. (see section 21.4.3). Section 21.3.5 describes other plans for campus improvement, largely based on an anticipated continued growth of the companion animal and equine caseload.

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

Virtually all cases in the teaching hospital and satellite clinical operations are used as teaching material for fourth year students. Efforts are made to maximize the teaching value of each case by requiring student involvement/participation (described in 21.4.5), routinely conducting case-based rounds discussions on these cases (allowing other students and house officers to benefit), and archiving case material in our medical records systems (PACS, UVIS) for rapid retrieval and broader dissemination. Clinical faculty and house officers encourage students to examine cases on other clinical services with interesting clinical abnormalities. Where appropriate, clients with animals that die or are euthanized in the VTH are counseled as to the benefit of a complete post-mortem examination, which gives other students opportunity to perform and interpret necropsies. Faculty use actual case-based material (and images) in Years I-III core curriculum and selectives, and several selectives are intentionally designed to introduce clinical material to students in the pre-clinical years. Pre-clinical year students also have the opportunity to take elective, selective, and summer programs that utilize hospitalized cases in the VTH.

21.5. Library and Information Resources

21.5.1. Describe and comment on the adequacy of information retrieval and learning resources.

The Veterinary Medical Library (http://www.lib.ncsu.edu/vetmed) is one of four branch libraries of the NCSU Libraries. Administered by the NCSU Libraries, the library primarily supports students, faculty and staff in the College of Veterinary Medicine. The library also serves agricultural and biomedical scientists in other NCSU Colleges and professionals across North Carolina and the nation through document delivery and interlibrary loans. The library collection consists of over 63,000 print and electronic volumes and 400 current journal subscriptions in the areas of veterinary medicine, medicine, public health, toxicology, pathology, microbiology, anatomy, physiology, animal sciences, zoology, practice management and animal welfare and ethics.

The NCSU Libraries holds over 3.5 million volumes, has 57,000 current serials subscriptions and over 5.4 million microforms, therefore ranking as the 27th largest research library in North America. Through our membership in the Triangle Research Library Network (TRLN) and NCLive, faculty and students have expanded access to almost 330,000 electronic resources. Through Tripsaver, students and faculty also receive expedited interlibrary loan services of medical research materials, with books generally available for pick-up in three days. Articles are sent directly to their email in about one to two days. As a member of the Association of Research Libraries, the NCSU Libraries is able to get materials via interlibrary loan from libraries around the world.

The entire College has wireless connectivity to support individual laptops or handheld devices. The library has two Windows XP computers with DVD/CD-R drives, and six Sunray workstations that offer internet access, MS Office applications with printing on a cost-recovery basis or downloading via USB ports. A computer lab, located in the library, consists of twelve Windows XP based computers with Microsoft Office and campus productivity software, eight of which have CD-RW drives. Students use these computers to access course materials using both MS Office and campus courseware applications and laboratory images, e-mail, and do research. The lab also contains a scanner and large capacity printer (printing costs are subsidized). An adjacent media lab provides eight user stations for viewing media, four for VHS and four for DVD. All have multiple headphone hookups and accommodate more than one user per station so groups up to six can view together at one time. The library loans wireless cards, laptops and tablet computers, and MP3/IPOD players to NCSU users, bringing not only the information but also information technology to the user.

Six group study rooms are available with pull down screens and dry erase boards. A large conference room includes a digital projector system, large video monitor and player, slide projector, x-ray viewer, and a teleconferencing system. The Special Collections room contains travel materials used by The International Veterinary Student Association and a dedicated computer for using language self-instruction programs on Rosetta Stone.

21.5.2. Describe the academic credential(s) for the librarian in charge of the library.

Laura Osegueda is the Head of the Veterinary Medical Library and has led the development and growth of the library for the last eleven years. Ms. Osegueda has a Masters in Library and Information Studies from an ALA-accredited university. She also has a Bachelor of Science degree in Biological Sciences. She is an active member of the Special Libraries Association (SLA) and Medical Library Association. In 2006, she served as Chair of the Biomedical and Life Sciences Division of SLA. Ms. Osegueda also serves on the Taskforce on Electronic Publishing of the Veterinary Medical Libraries Section of the Medical Libraries Association. Her research interests include digital libraries and computer-assisted instruction.

21.5.3. Briefly describe the availability of learning resources support for faculty and students, including personnel.

The university library system provides on-line access to numerous database searches for students and faculty use (see http://www.lib.ncsu.edu/searchcollection/databases/). The library is open 103 hours per week during the academic semesters. Hours are reduced during breaks, holidays and summer sessions. Wireless internet access is available throughout the library and study carrels provide electricity for laptops. One color photocopy machine and four black and white photocopy machines are available. The library provides citation management software, EndNote and RefWorks, for faculty and students and offers training in its use several times throughout the semester.

CVM library employees include the full-time Head of the Library, two full time Library Technical Assistants, one full time Library Clerk, and 2.5 FTE students. The librarian works with the library administration and staff to identify, develop and implement goals and objectives for the library. The librarian is responsible for all aspects of daily operations of the branch library, such as circulation, reference, interlibrary loan and document delivery, collection management and evaluation, and preservation. The NCSU Libraries 2006-2007 budget for the CVM was $69,790 for the purchase of books and media and approximately $319,000 for the purchase of journals both in print and online.

Seventeen individuals support media needs and computing resources within the College. Their organization is summarized in Appendix 5-1. Biomedical Communications (BMC) serves as the central media and visual communications resource for the College. The BMC staff creates high quality educational media using instructional and educational computer technologies, biomedical photography, medical illustration and graphic design. The director of BMC designs and maintains the College's classrooms and provides a variety of media equipment for use by students and faculty. The Director of Web-Based Instruction is familiar with the wide variety of University, desktop, and LAN-based resources available for the development of course content. He consults with faculty regarding instructional design and web-based learning strategies. He is in also in charge of the Mobile Computing program. The program has provided user training, technical support, repair services, and purchase advice to the nearly 500 PDA users over the past 4 years. Computing Resources maintains the College's computers, provides programming for major College initiatives, and maintains a 24-hour help-line for all College computer problems. Special projects performed by the IT department include enhancement of the electronic medical record system (UVIS) and the development of a Clinical Rotations Evaluation and Scheduling System (CRESS). The recently hired College Webmaster is in charge of developing and maintaining a uniform and creative Website for the College.

In addition to learning resources support, the university provides teaching resources support. The Faculty Center for Teaching and Learning (FCTL) (http://www.ncsu.edu/fctl) provides broad support for faculty instructional development. Current initiatives of the FCTL are Inquiry Guided Learning, Service Learning, The Scholarship of Teaching and Learning, and ePortfolios. With DELTA (Distance Education and Learning Technologies Applications), the FCTL provides numerous workshops for faculty to improve their instruction through the use of both technological and traditional methods. A listing of past and current workshops is available on-line at http://www.ncsu.edu/fctl/Events/Upcoming_Events/. In addition to workshops, the FCTL also offers instructional grants, informal consultations, and will gather student mid-semester feedback to share with instructors as well as videotape lectures for critique. DELTA provides IDEA (Innovations in Distance Education Applications) grants for faculty who wish to expand distance offerings. These need not be strictly distance education courses. One of our clinical pathology faculty received an IDEA grant to implement Virtual Microscopy as a method of improving student understanding of histopathology.

21.5.4. Describe current plans for improvement.

The lighting upgrade in the library recommended in the last accreditation report was completed and the reading room area is now well lit and heavily-used during all library hours. A $97,000 library renovation was completed in late 2006. The renovation included new carpeting, reupholstered furniture, new shelving end panels, and fabric panels in the copier alcove. A recent million-dollar endowment was received to provide ongoing support for the library's collections and facility. On November 16, 2006, the library was dedicated in honor of the donor and was re-named the William Rand Kenan Jr. Library for Veterinary Medicine.

Plans to re-design the library computing center and adjacent rooms for more flexible use as a learning commons are underway. Architectural plans for this renovation will be tied to plans for the new Randall B. Terry Jr. Companion Animal Veterinary Medical Center to ensure a coordinated design strategy. The College and NCSU Libraries are working together to look at various models of use and service that would widely serve teaching and learning. The library is working on a project to convert VHS materials to DVD in order to eliminate the need for VHS devices in the College and provide materials in a format that is widely viewable both at home and on standard computer configurations.

21.6. Students

21.6.1. Complete Tables A, B, C, and D, and analyze trends.

See Appendix 6-1 for Tables A, B, C, and D.

DVM student numbers have remained constant over the last five years. The College is planning an increase in class size to 80 for the class of 2011, but any further increase would require laboratory classroom renovations or additions. The number of interns and residents has gradually increased from 45 in 2001-2002 to 57 in 2005-2006. This gradual increase will likely continue as we have continued to add new specialties, and these specialties are expected to grow once the new hospital is built.

21.6.2. Provide a listing of student services. These services must include, but are not limited to, registration, testing, mentoring (advising), counseling, tutoring, peer assistance, and clubs and organizations.

The Student Services office is under the direction of the Associate Dean and Director of Academic Affairs. It is staffed by a Director, Assistant Director, the Clinical Counselor, the Director of Diversity, and two full time support staff.

Recruitment: Members of the Student Services office and the Director of Diversity participate in recruitment of applicants to the various CVM programs and provide guidance to applicants during the application process. They also mentor unsuccessful candidates to the program in ways to improve the applicants' success in future applications.

Registration: The Student Services office registers all DVM students for both core and elective classes. Veterinary students do not interact with the university registration system. Graduate students register for courses through the university registration process (on-line or telephonic registration).

Testing: Faculty supervise testing within courses. If the office of Disability Services for Students indicates that accommodations are required for particular students, the course leader is responsible for making those accommodations.

Disability Services: The Disability Services for Students office evaluates students to determine appropriate accommodations for any disabilities. For some accommodations, such as an isolated testing environment, the DSS office will proctor the examination at their facilities. More commonly, individualized testing is done in CVM conference rooms.

Mentoring: The CVM has mentored students for many years in a two-tier system. Students are informed of faculty members' areas of interest during first year orientation and select a faculty mentor. By their junior year, they are required to select a focus area, and at that time, a focus area mentor is assigned. Prior to the 2005-2006 academic year, the mentoring relationship was an informal one. Beginning in 2006, mentors were given more responsibility with respect to approval of any external clinical experiences (selectives in years 1-3 and externships in year 4). In 2008, a new Student Information System (Peoplesoft/Oracle) will be operational and the CVM mentors will have access to academic records of their mentored students (similar to undergraduate advisors) so they can more closely monitor the students' progress.

Counseling: The Counseling Center in the Student Health Center on the main NCSU campus provides counseling for students. In January 2006, the CVM hired an on-site Clinical Counselor. In addition to providing counseling for students, the counselor also provides initial counseling for hospital clients, faculty and staff, and makes referrals as appropriate. The counselor also works with clinical teams that may be having difficulties. A counselor intern began in August 2006 to provide additional services in the teaching hospital.

Tutoring: The office of Academic Affairs pays for tutoring services for students in academic difficulty. Students from the preceding class who were successful in the course in which the student is having difficulty are recruited for this purpose. Occasionally graduate students are hired as tutors.

Student Clubs and Organizations: The CVM currently has 24 student clubs, including student chapters of most national veterinary organizations. See Appendix 6-2 for a list of CVM clubs and organizations.

Drug and Alcohol Programs: The North Carolina Wellness Committee in conjunction with NCSU College of Veterinary Medicine oversees a substance abuse program for students that provides three seminars on substance abuse issues: one during first year orientation and two in their fourth year. The fourth year seminar introduces the Physicians Health Program to students which oversees substance abuse issues for veterinarians after graduation. Also, when student substance abuse issues arise, the Chairman of the Committee meets with the student, directs and oversees a substance abuse evaluation, and helps with out patient and/or inpatient treatment options. Student interaction with the coordinator of these programs is confidential. If treatment is necessary, a recovery program is initiated including follow up drug screen monitoring and weekly meetings with the student that helps insure that the student has available all necessary tools for a successful recovery.

Legal Services: All students attending NC State University pay a legal services fee that supports Student Legal Services. A wide range of services is provided. One of particular value to veterinary students is review of employment contracts. More information on Student Legal Services is available at http://www.ncsu.edu/stud_affairs/legal_services/.

Medical: Veterinary students have full access to the University's student health care system. Full information on services can be found at http://www.ncsu.edu/student_health/

Reduced Cost Veterinary Care: Students can use the Veterinary Teaching Hospital for their own pets. They receive a 20% discount on any services received.

Educationally Related Travel Support: The Academic Affairs office provides financial support for educationally related travel through three allocations. $10,000 is allocated to SCAVMA to distribute to students who are going on trips related to their DVM education. SCAVMA has a well-organized structured process for application for these funds. An additional $5,000 is provided to SCAVMA to support students attending the SAVMA Symposium. The CVM Spring Break is scheduled to coincide with the SAVMA Symposium to allow student attendance without missing classes. Finally, students can apply for funds to support international travel through the Veterinary International Programs Office. A faculty committee determines funds distribution.

Veterinary International Programs (VIP): The CVM's Veterinary International Programs has faculty assigned to oversee student activities in various parts of the world (Europe, Australasia, Africa, Central and South America). The faculty members work with the International Programs office on the NCSU campus to meet the various requirements for student international travel. In the last three years, programs have included:

Asia	July/August 2003	Thailand	4 students
	December 2005	Japan and Thailand	8 students
Africa	May 2004	South Africa	8 students
	May 2005	Cameroon	2 students
Europe	December 2000	Netherlands	9 students, 1 resident
	December 2002	Copenhagen, Denmark	7 students
	Summer 2003	Barcelona, Spain	1 student
	Summer 2005	Lohmar, Germany	1 student
	March 2006	Friedrich-Loeffler-Institute for Animal Health, Germany	2 students
Central and South America	June 2003	Bolivia	6 students
	June 2004	Nicaragua	6 students
	June 2005	Ecuador	4 students
	July 2006	Mexico	1 student

In addition to programs conducted by VIP, there are clinical rotations that involve international travel (Veterinary Clinics in Thailand – Chang Mai University) that occur under inter-institutional agreements with the host colleges. Students who wish to participate in international programs are required to take a selective to prepare them for such travel (Health and Safety in Third World Countries).

Emergency Loan Program: The Office of Academic Affairs manages an Emergency Loan program, funded by the auxiliary of the NCVMA. Students can apply for up to $500 for up to 90 days to cover short-term financial needs. There is a 1% administrative fee associated with these no-interest loans.

PDA and Computer support: The College has had a PDA program for many years. The Director of Web Based Education assists students with PDA related problems and provides guidance on configuration of personal computers so they function optimally in the CVM wireless network computing environment. He is also responsible for development of new programs for the PDA initiative, assisting faculty with course web sites, and developing tools to assist in outcomes assessment (on-line teacher evaluations).

Biomedical Communications: The office supports students in development of research posters and presentations, including the required senior clinical conference presentations.

21.6.3. Provide a summary of college activities in support of placement of graduates.

The College provides career placement services to students in several ways. The Student Services office provides individualized resume and cover letter review and preparation. The Colleges' "career planning" website provides answers to frequently asked questions for students beginning their search as well. Employers can send position announcements to the Student Services office for posting on the website. The College hosts an annual career fair in conjunction with the North Carolina Veterinary Conference. Student Legal Services will review initial employment contracts at the student's request.

21.6.4. Provide a description of the testing/grading system (scoring range, pass levels, pass/fail).

North Carolina State University uses a letter graded, plus minus system. Each gradation is associated with a 1/3 quality point increment. While an A+ has a quality point of 4 1/3, no student can have a GPA greater than 4.0. Faculty members are responsible for determining the grading scale for individual courses. Examples of eight, nine, and ten-point grading scales are included in the Student/Faculty Handbook. The Handbook also includes a more in-depth discussion of the current grading system and academic progress policies (http://www.cvm.ncsu.edu/academicaffairs/handbook/). Selectives (see section 21.9.1 for more information) are graded on a satisfactory/unsatisfactory basis. The fourth-year clinical rotations are also graded on a satisfactory/unsatisfactory basis.

21.6.5. Provide academic catalogue(s) (or an electronic address for this resource) and freshman/upper-class orientation materials.

The NC State Course Catalogue is available on-line at http://www2.acs.ncsu.edu/reg_records/crs_cat/directory.html. While it includes the CVM courses, it is not used by the veterinary students, as the student services office registers them for their appropriate courses.

The CVM Student/Faculty Handbook is available on-line at:
http://www.cvm.ncsu.edu/academicaffairs/handbook/

See Appendix 6-3 for orientation schedules for first and fourth year students.

21.6.6. Describe the system used on an ongoing basis to collect student suggestions, comments, and complaints related to the standards for accreditation.

The academic affairs office reminds students annually of the availability of a suggestion box in the student services office where they can anonymously place suggestions, comments, and complaints related to the standards for accreditation. None have been received for at least 10 years.

21.6.7. Describe current plans for improvement.

The University is presently changing its legacy student management system to a commercial system (PeopleSoft/Oracle Student Information System). With this implementation, several things will be changed in the management of student records. One change (invisible to students) will be batch processing of registration for classes with fixed enrollment by the CVM (rather than having to make such requests through the registrar's office). This will improve operational efficiency of the student services office.

The PeopleSoft implementation will allow College specific grading systems. The CVM faculty had voted against the plus/minus grading system prior to its implementation at NCSU. After is was implemented, it was voted to change the clinical rotations to pass/fail grading, in part because 13 gradations of student performance in a clinical environment were thought to be excessive and plus/minus letter grading or pass/fail were the only two options available within the NCSU system. With the implementation of the new system, we plan to increase the number of gradations within the senior rotation grading scheme to four (Honors, Pass, Marginal and Fail) from the current two-tiered system. This will more accurately portray student performance levels to other universities evaluating our students for postgraduate programs, as well as providing an incentive for hard work to those students who are grade motivated. Marginal grades will be treated as D's in our academic standards documents.

We are changing our informal mentoring system to a system closer to the undergraduate advising model, whereby the advisors keep closer track of their advisees progress and have responsibilities related to their advisees selection of selectives and senior rotations. This should improve the mentoring process.

The College is developing a 360-degree evaluation system for faculty, house officers and students within the VTH, referred to as CRESS (Clinical Rotation Evaluation and Scheduling System). Obtaining feedback (student grades, faculty teaching evaluations) in the VTH environment has been difficult due to the wide distribution of students, the fact that student, house officer and faculty rotations in the clinical environment are not synchronized, faculty travel to locations where they didn't have access to student evaluation forms and the difficulty of receiving, compiling and distributing the results of the numerous evaluation systems. The new system (modeled, in part, on the VOLES system at the CVM, University of California at Davis) puts these evaluation systems in one program that can be accessed via the internet from any location. It includes automated email reminders to each of the groups when they have not completed evaluations by a set date, notification of course leaders and department heads if faculty don't complete student evaluations on time, and incentive for students (early access to grades) if they complete faculty evaluations. Implementation is scheduled for May 2007 with the class of 2008.

We are changing the approval system for external student activities (selectives, senior externships) so that the focus area leaders approve these activities. In the past, these activities were only approved at the associate dean level. Focus area leaders are more likely to interact directly with the practitioners offering these types of experience, and can provide better guidance to students when planning their external experiences.

21.7. Admissions

21.7.1. State the minimum requirements for admission.

The criteria for admission to the College of Veterinary Medicine are determined and reviewed periodically by the Dean and the Faculty Committee on Admissions. Applicants are evaluated on their academic performance, their understanding of the veterinary medical profession, their achievements, and their professional potential. The University complies with all Federal and State statutes regarding nondiscrimination.

Undergraduate candidates should be pursuing a baccalaureate degree and meeting all of the requirements and course stipulations of that program. An undergraduate degree, however, is not required for admission. Applicants must only complete prerequisite courses to fulfill academic requirements. Candidates are *required* to have a minimum of 400 hours of clinical, agribusiness/farm, health science or research experience.

Candidates are considered academically qualified for admission if they meet the minimum standards, which are:

Standard	NC Residents	Non-Residents
Cumulative GPA	3.0	3.4
Required Course GPA	3.3	3.4
Last 45 Credit Hours GPA	3.3	3.4
Graduate Record Exam	General Test	General Test

The cumulative GPA includes all college courses. The GPA for the last 45 credit hours goes back a semester at a time. If a student completed 44 credit hours in his/her final three semesters, the College of Veterinary Medicine would go back four semesters to calculate the last 45 credit hours, meaning it may actually be for 46 hours or more. Grades achieved in courses that have been repeated are averaged.

Alternative Eligibility: It is recognized that some applicants may not meet the minimum academic standards. Consideration under "Alternative Eligibility" applies only to GPA requirements and not the other admissions requirements. A subcommittee consisting of four members of the Admissions Committee reviews alternative eligibility requests. Students in this category are usually slightly below minimum standards in one GPA category. If the subcommittee feels that the applicant would significantly improve the composition of the class (e.g., unique educational, employment, or life experiences), then the applicant's folder is forwarded for review.

Standardized Test Requirement: The GRE score is the total from verbal and quantitative portions of the general test. If an applicant takes the test more than once, the highest total score is used from a single testing date, not the highest of each section. The College does not require a minimum GRE score.

Courses required for admission:	Semester Hours
Animal Nutrition *(new requirement for 2008 admissions cycle)*	3
Biochemistry	3
Biology with lab	4
Business/Finance	6
Calculus or Logic	3
Chemistry, General with labs	8
Chemistry, Organic with labs	8
Composition & Writing, Public Speaking, Communications	6/7
Genetics	3/4
Humanities/Social Sciences	6
Microbiology with lab	4
Physics with labs (must be at least a two-course series)	8
Statistics	3

Required courses must be completed with a grade of "C-" or higher. All but two of the required courses must be completed by the end of the fall semester during which the student applies. The remaining courses must be

completed in the spring semester. Required courses cannot be completed in the summer immediately preceding matriculation. Applicants offered admission must submit transcripts by July 1 showing conferral of degree, completion of required courses, or both (if applicable).

The College uses the Veterinary Medical Common Application Service (VMCAS), with an October 1 deadline date for all application materials.

21.7.2. Describe the student selection process, including measures to enhance diversity.

Subjective Review: In addition to the VMCAS application form, the College utilizes an online supplemental application form to provide an opportunity for the applicant to express relevant background information and qualifications that are not included in the VMCAS application. Supplemental application questions are changed yearly by the Admissions Committee. Questions are designed to assess the applicant's critical thinking skills, ethical reasoning and knowledge of the profession.

The selection procedure is based on both academic and non-academic criteria. The admissions committee assesses the seven criteria listed under 21.7.3.

The Director of Diversity serves on the Admissions Committee to present applicants to the committee who could significantly enhance the diversity of the profession. The Director of Diversity is also responsible for recruitment of qualified applicants that offer diversity (e.g., cultural, ethnic, gender, socioeconomic, geographic etc.) that is underrepresented in the College and veterinary profession.

Review process: Each applicant's folder is assigned to three members of the Admissions Committee for review. For each folder, one of the three reviewers is assigned to be the primary reviewer. After evaluation of the factors listed under 21.7.3, each committee member scores the entire folder using a computerized visual analogue scale. This scoring system allows reviewers to holistically evaluate applicants to the program. Reviewers can consider all aspects of an applicant's background and take into consideration unique educational, employment and life experiences, as well as perseverance through personal hardships. Numeric scores are then generated and used to determine rankings for both the non-resident and resident applicant pools.

- Non-resident Applicants: Offers are made to non-resident applicants in late December or early January. Approximately 14 non-residents accepted into each class.

- North Carolina Resident Applicants: A full-day Admissions Committee retreat takes place in early March. There are approximately 62 residents accepted into each class. Resident applicants who ranked in the top 57 are offered admission to the College without further discussion. The goal of the retreat is to discuss the 15 applicants who ranked from 58-72 (5 applicants above and 10 below the 62 available positions cut-off). The entire committee is given ample time prior to the meeting to review the folders of these applicants. Each applicant is discussed, the discussion being led by the primary reviewer, and these 15 applicants are then rescored using the same visual analogue system, by the entire committee to determine the final rankings.

Special Admissions Programs: Two scholars programs allow tracked admissions into the College. The Food Animal Scholars program is run in conjunction with the Colleges of Agriculture and Life Sciences at North Carolina State University and North Carolina Agricultural and Technical State University and allows admission of up to six scholars per year (the average number is around two per year). The Laboratory Animal Scholars program is run in conjunction with North Carolina Agricultural and Technical State University (a historically black university) and provides spaces for up to two scholars per year. Any spaces filled by these scholars count toward the targeted total of 76-80 students per class.

21.7.3. List factors other than academic achievement used as admission criteria.

Veterinary Experience: Supervised experiences in three or more different areas of veterinary medicine are *highly recommended*. The work must be completed under the supervision of a veterinarian (or PhD scientist if scientific-based research). Applicants are evaluated on duration, level of duties, and diversity of the experiences.

Animal Experience: All other animal related experiences are evaluated. Like veterinary experience, animal experience is evaluated on duration with at least 100 hours or more contact time highly recommended; multiple activities of long duration are preferred. This category does not include pet ownership.

Educational Experience: Consideration is given to academic excellence, the course load per term, employment concurrent with school attendance, and participation in intercollegiate athletics. This also includes evaluation of accomplishments such as honors, awards and advanced degrees.

Evaluation Forms/Recommendations: Three recommendations are required using the VMCAS Applicant Evaluation forms and a supporting letter from the evaluator. Two must be from veterinarians or Ph.D. scientists with whom the applicant has worked. The admissions committee may contact references directly if further information or clarification is required. Applicants are asked to provide contact information for veterinarians with whom they have worked who did not provide a written VMCAS Applicant Evaluation form. These veterinarians may be contacted at the discretion of the admissions committee evaluators.

Personal Statement: Applicants are asked to write a personal statement that will allow the committee to understand:

- something about the applicant as a person,
- how the applicant's interest in veterinary medicine developed within the context of their veterinary and animal-related experiences, what prepared the applicant for a career in veterinary medicine, and their understanding of the profession, and
- the applicant's career goals and what they currently anticipate doing with a degree in veterinary medicine. Their career goals may change after their experiences within the program, but the committee would like to know what their current interests are and how they would anticipate using their training as a veterinarian.

The statement is also evaluated for maturity, written poise, originality and writing skills.

Diversity: Applicants are evaluated for the diversity they could bring to the class in terms of location and duration of North Carolina residency, unique educational, employment and life experiences, ethnicity, hardship considerations, and established/demonstrable interest in underrepresented veterinary occupations

Extracurricular and Community Activities: The level, depth of accomplishment, and leadership roles in clubs (college/university, hobby) or athletics (intramural, club), and community organizations are also considered.

21.7.4. Complete Table A.

See Appendix 7-1 for Table A.

21.7.5. Describe current plans for assessing the success of the selection process to meet the mission of the college.

With the current selection process, our attrition rate is low (less than 5%) and success rate on licensing examinations is high (see outcome assessment data). Many of our graduates are accepted into internship and residency programs (see curriculum assessment data).

The admissions committee intermittently reviews the success of the selection process. For example, in 2000 applicant interviews were discontinued as it was found that interview scores did not correlate with success in the DVM program and there was a gender bias detected in the process.

21.8 Faculty

21.8.1. Complete Tables A and B, and assess the strengths of the faculty and support staff in fulfilling the college mission.

See Appendix 8-1 for Tables A and B.

Faculty numbers have expanded in key areas of growth in veterinary medicine and biomedical science. The CVM has established the Animal Welfare, Ethics and Public Policy Program, which includes the shelter medicine and behavior medicine programs. Faculty numbers have increased in all existing companion animal or equine services. Clinical faculty members with many years of experience have been successfully retained in most services. New clinical services with corresponding faculty include dentistry, radiation oncology, behavior, companion animal emergency services, equine podiatry and equine theriogenology. Overall, the strength of these services is excellent, providing a high faculty/student teaching ratio. In other realms of teaching, the anesthesia service has re-instated a residency program. In the basic sciences, genomics has been a key area of growth in response to key changes in the nature of basic science. Additional strengths are in food animal production (including swine, poultry, dairy, and small ruminants), pathology, pharmacology & risk assessment, immunology, and infectious diseases. For example, we have more strength in swine and poultry health/production than the majority of other US veterinary educational institutions. Our pathology training program for veterinary students and residents is excellent in both clinical and anatomic pathology. Epidemiology instruction for veterinary students has markedly improved as measured by student reviews and peer reviews of faculty instruction. The Theriogenology team has strengthened its clinical teaching by concentrating on equine and canine reproduction, primarily through the development of the Equine Health Center at Southern Pines and by research on canine reproduction with student involvement. The number of faculty members in the Population Health and Pathobiology (PHP) department increased dramatically in 2002 because of a CVM reorganization that essentially doubled the size of this department. The anatomic/clinical pathology, parasitology, and immunology/bacteriology/virology programs shifted from the former department of Microbiology, Pathology and Parasitology to this department.

Collectively, our faculty expansion is intended to enable students to understand pathophysiology from the gene to the patient, and to give students basic training in sustainable research programs. Local on-farm teaching opportunities in ruminant health management have decreased because of urbanization; however, the faculty have maintained clinical instruction quality through private practitioner and state government partners.

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

See Appendix 8-1 for Tables C and D.

21.8.3. Assess the challenges for your college in maintaining faculty numbers and quality.

In certain disciplines it has been particularly challenging to attract and retain board-certified or otherwise qualified specialists, such as pathology, clinical microbiology, ophthalmology, oncology, neurology and dermatology. We have been very fortunate to maintain and, in some instances, grow disciplines despite the salary disparity between academic and private practice positions. We continue to attract highly qualified individuals that select NC State because of the quality of its teaching, clinical, outreach, and research programs. We are currently in a period of relative growth, and have added faculty in areas of value to our core missions, including extension and engagement, pathology, dentistry, behavior, and welfare. In basic research, attracting the best and brightest young faculty is difficult in times of tight national research budgets. Start-up packages have become difficult to put together to meet the needs of beginning faculty members. In addition, retention, promotion and tenure processes are driven to some degree by the ability of investigators to obtain extramural funding. We are exploring creative sources of bridge funding to prevent losing some of our brightest, most talented junior faculty.

21.8.4. Provide information on the loss (what discipline/specialty) and recruitment of faculty (Table A).

See Appendix 8-1 for Table A.

In clinical and diagnostic services, some vacancies have been filled by highly qualified individuals. There has been turnover in key hospital services including radiology and anesthesiology.

Some pathology faculty left for positions in private industry or governmental agencies in the Research Triangle. Two food animal/ruminant faculty departed for positions in private practice and industry.

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

Faculty are promoted and tenured on the basis of their performance evaluated against the expectations set forth in the "Statement of Mutual Expectations" (SME). The SME is negotiated each year between the faculty member and Department Head to spell out the faculty member's assigned responsibilities and percentages of effort assigned to each. All faculty (including non-tenure track) are required to prepare the SME as part of the annual activity report for the previous year and the plan for the next year, all of which are discussed at the annual review session with the Department Head.

Clinical track faculty are evaluated through a process similar to that for tenure track faculty. This is becoming an increasingly important issue because of the increased numbers of clinical track faculty.

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

In all departments, the weight assigned to each of these areas is directly relevant to the percent effort assigned to faculty in these areas. Percent effort is routinely examined and altered when job positions and expectations change.

For promotion/tenure deliberations and compensation recommendations, each faculty member's performance is evaluated in light of his/her assigned responsibilities and the weight assigned to each. At NC State University "Service" is defined as "Service to the university itself and to professional societies." Responsibilities for clinical and diagnostic services, such as pathology and patient care in the Veterinary Teaching Hospital are defined as either teaching or extension and engagement, depending on the faculty member's particular situation.

21.8.7. Briefly describe faculty professional development opportunities available in the college/university.

Faculty members are encouraged to take periodic sabbatical leaves. Departmental funds are available for professional meeting attendance, although they are largely dependent on hospital and grant funding and may vary from year to year. Junior faculty can attend a monthly writers group to help them organize their time, write high quality grants, and publish their results. Additional development opportunities open to all faculty include grant writing workshops, teaching workshops, internal research grants and teaching innovation grants.

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

The new Center for Comparative Medicine and Translational Research (CCMTR) is specifically designed to bring clinicians and basic scientists together in collaborative units. This way, clinicians can take part in large-scale basic science projects and basic scientist can understand the opportunities and relevance of their work to animal health. This program should improve CVM faculty retention by creating new and exciting opportunities for research collaborations. A combination of faculty retirements and the addition of new positions has led to the opportunity for a "Cluster Hire" of up to six faculty members with a focus on livestock infectious disease and biosecurity.

21.9. Curriculum

21.9.1. State the overall objectives of the curriculum and describe how those objectives are integrated into individual courses.

The administration, faculty, and staff of the College of Veterinary Medicine at North Carolina State University have formulated a challenging and meaningful academic curriculum of professional study designed to prepare new Doctors of Veterinary Medicine for varied and broad careers in veterinary medicine.

The professional program calls for two phases of education. A preclinical 3-year phase is followed by a 1-year clinical phase. The first through third years of the program consist of a gradual progression from understanding the basic sciences and workings of the body in health, to an understanding of the mechanisms of disease, to the clinical application of veterinary science.

Each of the first six semesters in the curriculum is divided into a 13-week core course period followed by 2 weeks of selective courses. The objective of the core portion of the curriculum is to provide a broad-based knowledge base to the students. The objective of the selective portion of the curriculum is to provide in-depth exposure to specific areas of interest. Individual selectives are 1- to 2-weeks in length, each week corresponding to one academic credit. Selectives are designed as small group, short but intensive course experiences that emphasize both practical aspects of veterinary medicine and in-depth training in specialty areas. The focus of individual selectives range from bench-top laboratory research experience, anatomy and physiology of exotic species, physical therapy and rehabilitation, dentistry, surgical laboratories, public health policy, and client communications and grief counseling.

The format of the fourth year of the professional program is a 2-week rotation approach to clinical education. The academic calendar is divided into 24 2-week segments. Students are required to successfully complete a minimum of 20 rotation blocks for graduation. Off-campus experiences are possible in private practice, industry, government agencies, and/or other postdoctoral opportunities. Four 2-week vacation blocks are possible during the fourth year of the program. The clinical program provides a heavy emphasis on actual “hands-on” clinical practice and is demanding both physically and mentally.

21.9.2. Describe major curricular changes that have occurred since the last accreditation.

Beginning with the class of 2006, students declare an intended “focus area” by September 15 of the third year consisting of one of the following: Epidemiology and Public Health, Equine Practice, Food Animal Practice, Laboratory Animal Practice, Mixed Animal Practice, Pathology, Small Animal Practice, or Zoological Medicine. These focus areas aid in concentrating clinical efforts in the student’s chosen career path. All students must successfully complete the following rotations: Radiology, Anesthesia, Necropsy, and Clinical Pathology as well as a rotation in medicine, surgery, emergency/critical care, and population medicine. Each focus area includes between 14-16 required rotations. The remaining 8-10 rotations are chosen under the supervision of the student’s focus area mentor and the focus area coordinator.

21.9.3. Describe the process used for curriculum assessment (including course/instructor evaluation) and the process used to assess curricular overlaps, redundancies, and omissions.

The Faculty Committee on Curriculum and Course Evaluation (FCCCE) routinely evaluates all courses on a 3-year cycle. In addition, courses are evaluated in any year in which the course leader changes or any action is taken that requires a course action form (i.e., change in course credit hours, change in course name or number, change in grading criteria). The FCCCE structure and responsibilities, as quoted from the CVM bylaws, follows:

The function of this committee will be confined to matters of the professional DVM curriculum and to the periodic review of those course offerings. The responsibilities of the committee are to recommend to the faculty curricular content and program development and to conduct ongoing reviews of all DVM courses. Faculty will decide courses of action in programmatic change based on committee review.

The student members of the FCCCE are responsible for distributing course evaluation forms to their classmates and encouraging a high response rate. A return rate of 50% is required for FCCCE evaluations. In the past year, we have transitioned from a written format in which individual faculty members of the committee summarize the evaluation results to an electronic format for ease of data compilation. Both the individual evaluations and the

summary of the course evaluations are returned to the course leaders. If a course evaluation reveals a particular concern, the chair of the FCCCE or the Associate Dean and Director of Academic Affairs will meet with the head of the department in which the course is taught. In addition, any course of concern to the FCCCE is reevaluated in the following year rather than waiting for the normal 3-year cycle. Evaluation returns less than 50% are reported in descriptive form to the course coordinators and their department head.

In addition to course evaluations, the students complete instructor evaluations. These are intended to separate evaluation of the course from evaluation of the instructor, although some cross-over occurs. All departments have established mechanisms for peer evaluation of instructors. Instructor and peer evaluations are returned directly to the faculty member's department chair and are not seen by the FCCCE.

Each year, the Dean of the College conducts exit interviews with the fourth-year students, gathering information on the overall education process, specific areas of perceived curricular strength and weakness, information on the education environment, and other relevant matters.

In addition to the above methods, the College periodically conducts surveys of its alumni to assess the perceived value of individual courses as well as the overall curriculum. Survey results are shared with the FCCCE and used in assessment of the curriculum. In 2005, the survey format was changed from periodic surveys of all alumni to surveys of alumni one and five years post graduation. Alumni are also asked to provide surveys to their employers (See Section 21.11.1.d).

The College recently implemented a clinical skills check-off book for veterinary students, which provides listings of which courses address specific skills. This mechanism ensures training in core skills is not omitted in the curriculum.

Each year, the Associate Dean and Director of Academic Affairs reviews the performance of NCSU students vs. national norms on the North American Veterinary Licensing Examination (NAVLE). Each subject area is reviewed to determine if NCSU students are below their peers in any particular area.

21.9.4. Describe the strengths and weaknesses of the curriculum as a whole

Strengths

- The development of focus areas. The focus area program involves basic and applied veterinary medical science courses which all students are required to take combined with opportunities for the individual student to focus on areas of particular interest. This program is a direct result of previous alumni surveys suggesting the need for an increased level of expertise in the new graduate's area of interest. This change allows students to graduate with increased knowledge and skill in their intended area of work.

- The use of outcome assessment in curricular revisions (see 21.9.3 above).

- The number of CVM students applying for and successfully obtaining post-graduate training in internship programs. The number of CVM students applying for internships was 17, 29, 33, and 42 in 2003, 2004, 2005, and 2006, respectively. Success rates in obtaining internships were 77.8% (national average, 63.6%), 66.7% (national average, 63.1%), and 73.2% (national average, 62.3%) in 2004, 2005, and 2006, respectively.

Weaknesses

- The ongoing challenge of teaching ever-increasing amounts of information without a corresponding increase in the duration of the program.

- Our processes for evaluating individual courses and instructors are very strong; however, evaluation of the curriculum as a whole is challenging. The return rate of alumni surveys and employers of our alumni is frustratingly low. In addition, the FCCCE does not have the power to implement significant changes to the curriculum. Instead, recommendations are sent to the faculty as a whole for voting, a process in which disagreement with single items can lead to disapproval of more global changes.

- Promoting progressive changes among faculty, including moving away from our currently heavily didactic curriculum to one that embraces teaching innovations and more active involvement of students in the learning experience, is an ongoing challenge.

- The increasing demands on faculty members' time, increased pressure to bring in research overhead dollars and hospital income, and increasing instruction of house officers, all compete with time demands of the curriculum.

21.9.5. Describe the preceptor and externship programs (including the evaluation process).

In the past, preceptor and externships were largely overseen by the office of the Associate Dean and Director of Academic Affairs according to the following sequence: 1) student identifies desired experience, 2) student (or faculty, in some cases) obtains signed acknowledgement that outside individual is willing to accept a student and provide an evaluation, 3) student gets signature from faculty mentor that experience is approved and is reminded of the requirements to gain credit, 4) student participates in experience, 5) student turns in required information (including case log or research summary) and an evaluation of the experience, 6) faculty solicits evaluation of student from external supervising veterinarian/scientist, 7) faculty thanks outside person, seeks feedback, asks if willing to continue having students. Any problems with experiences are handled on a case by case basis. In the current year, this program is being revised with the new title of "Extramural Experiences." The oversight for outside experiences is being shifted to the focus areas, with the idea that faculty in a given focus area are best able to help choose and evaluate experiences in their area of interest. Courses have been designed and course coordinators assigned. Students will be able to obtain selective, elective or 4th year rotation credit, depending on the course selected. The course coordinators have met to agree on standardized forms and to assure consistency between the focus areas. Summary statistics for the experiences will be provided to the office of the Associate Dean and Director of Academic Affairs in order to monitor the scope of the program and to acknowledge the contribution of the outside veterinarians/scientists.

21.9.6. Curriculum Digest

See Appendix 9-1.

21.9.7. Audit of Selected Curricular Content

See Appendix 9-2.

21.9.8. Describe current plans for revisions.

Changes that are underway with anticipated ongoing revisions include further development and expansion of the focus areas and the Extramural Studies program. We are also modifying the VMC 962 course "Ethics, Professional Development and Practice Management." This course will be taught as two 2-credit courses, one of which will be taught during spring of the third year and the other of which will be offered during the 2-week selective period. Students will be allowed to participate in the 2-week selective part of the course in their first, second or third years. We also plan to implement an online evaluation system for all courses, instructors, and students, pending experience in the 2007-2008 academic year with the Clinical Rotation Evaluation and Scheduling System. To enhance diversity awareness among our students and optimize their abilities to relate to people of varying ethnic, racial, and socioeconomic backgrounds, beginning with the class of 2011, students will be required to participate in one diversity awareness seminar per year during each of the first three years of the curriculum. Ongoing discussions are looking at further integration of material within and between courses.

The last major revisions in the curriculum resulted in the institution of selectives, development of focus areas and their associated requirements, and restructuring of a few core courses. Subsequent to a recent administrative retreat, discussion has begun on how to more efficiently and effectively teach in years 1-3 of the program. This initiative was announced to faculty at the November 15, 2006 faculty meeting and will be the major charge of the Faculty Committee on Curriculum and Course Evaluation for the upcoming year.

21.10. Research Programs

21.10.1. Describe up to five programs of research emphasis and excellence:

1. Center for Comparative Medicine and Translational Research (CCMTR)

The CVM-based CCMTR is under the direction of Dr. Gregg Dean and has over 80 tenure-track faculty in 14 academic departments, across four colleges, engaging in collaborative approaches for the study of comparative molecular medicine. Veterinary Medicine is heavily represented in the center, comprising more than 60% of the total membership. Each of the three departments in the CVM is evenly represented. The mission of the CCMTR is to enhance collaborative, translational, interdisciplinary approaches for the comparative study of animal/human diseases and to facilitate the movement of innovative discoveries from the bench to the clinics. An integral part of the center's mission is to provide clinical and translational research opportunities to veterinary students, graduate students, clinical residents and postdoctoral fellows. This is done by providing internships in the different laboratories, by financially supporting the summer research internship program at the CVM and by helping develop and participating in the newly developed Clinician Scientist Focus area in the CVM curriculum. Overall the educational opportunities provided by the center ensure that the CVM students have access to state of the art technologies in veterinary medicine and, in addition, that they can explore new opportunities in veterinary medicine that are being provided by clinical and translational research. Equally important, the CCMTR provides a unique environment which combines clinical and non-clinical training that nurtures and promotes the development of future academic veterinary faculty.

2. Center for Chemical Toxicology Research and Pharmacokinetics (CCTRP)

The CCTRP develops mechanistic based approaches to assess the risk to human and animal health from exposure to occupational chemicals, environmental contaminants, animal drugs and nanomaterials. The Center is under the direction of Dr. Jim Riviere and has eight faculty, two post-doctoral fellows, seven technical staff and eight graduate students supported by over six million dollars of extramural support (government and industry). Research is focused on probing the mechanism of dermal exposure to occupational and environmental chemicals, targeted to the effects of complex chemical mixtures. In addition, the Center's strength in mathematical model development and pharmacokinetics is also applied to the problem of preventing chemical and drug residues in the edible tissues derived from food producing animals. Part of the federally mandated Food Animal Residue Avoidance Databank (FARAD) is housed in the Center. A third strength of the Center is the pharmacokinetic program, which focuses on veterinary clinical pharmacology research and is an integral part of the College's clinical pharmacology resident training program. The CCTRP interacts with NCSU veterinary student education through a selective on Skin Toxicology, didactic lectures in pharmacokinetics and antiparasitics to second year veterinary students, individual veterinary student employment in Center labs, as well as contact with all fourth years students through a FARAD rotation in the senior large animal medicine rotation. CCTRP faculty members are also active in the CVM Comparative Biomedical Sciences, Biomedical Engineering, Food Safety and Biomathematics graduate programs at NCSU.

3. Program in Pulmonary Pathobiology Research

The NCSU CVM maintains a high quality research program in pulmonary pathobiology that involves internationally-recognized investigators who are elucidating basic pathogenetic mechanisms associated with a range of pulmonary diseases, many of which (e.g., fibrosis, bronchitis, allergic airway inflammation [asthma-like diseases]) are also prevalent in animal populations. The pulmonary research program involves four PhD scientists who have substantial extramurally-funded individual programs and, importantly, have substantial interactive research programs (and publications) with other members of the faculty. Dr. Kenneth B. Adler is an internationally-recognized expert in the area of airway inflammation. Dr. Linda Martin has a fast-growing program in airway plasticity and asthma. Dr. Philip Sannes has a nationally-known program in pulmonary fibrosis and lung development. Dr. Arnold R. Brody has an internationally-known research program in environmental lung disease and fibrosis. Each of the above-mentioned investigators has active collaborations with several DVM researchers. For example, Dr. Adler has published work with Dr. Eleanor Hawkins of the DOCS department related to characterization of naturally-occurring chronic bronchitis in dogs, and with Dr. Sam Jones on mechanisms of inflammatory cell migration to sites of injury. These collaborations serve several purposes other than melding human and veterinary respiratory and pulmonary research. They allow DVM researchers the opportunity to take advantage of the state-of-the-art technology and expertise available in the laboratories of these individuals so as to enhance their own research programs, and also offer the opportunity for

students and residents to be involved in hands-on research, serving to train the next generation of veterinary researchers. This group has active grant awards of over $8 million dollars, with the current year portion being $1.8 million.

4. Genomic Sciences

Since mid-2002, the CVM has made a major thrust in research activities involving Genomic Sciences. During this time, genomics technologies and resources have been made accessible to CVM faculty, with a consequential stream of new and exciting opportunities for our CVM and graduate students. Three programs are highlighted here.

- Dr. Jorge Piedrahita brought a strong program in swine genomics and transgenics to the CVM. This program concentrates on development of high throughput technologies for the analysis of gene expression profiles in swine for the understanding of normal and diseased states. In addition, the program develops genetically modified swine that can be utilized to understand disease processes in relation to both animal and human health. As part of the program, graduate and veterinary students are provided with opportunities to participate in ongoing research through laboratory internships.

- Dr. Matthew Breen's program in Canine Genomics has been working closely with faculty in a variety of areas (e.g., neurology, oncology, dermatology, pathology, biostatistics) to generate highly interactive groups of faculty and associated research/clinical staff to address matters of canine health with new approaches. Members of these groups have developed a Selective course in Canine Genomics and Cancer for our DVM.

- Dr. Jon Horowitz's program studies functional and biochemical analysis of transcription factors, their comparative genomic organization, transcription patterns and functions in development and tumorigenesis in humans, mice and zebra fish. These comparative functional and genomic studies have impacted DVM students directly via the lab's participation in a selective course on Transgenic Animals. Additionally, the Horowitz research laboratory is open to DVM students that wish to perform summer research projects or obtain DVM/PhD degrees. These and other CVM laboratories that are engaged in research using Genomics technologies provide numerous opportunities for DVM students to gain valuable experience through lab based Selectives, summer research projects and/or the Clinician Scientist Focus area. In addition, these labs are open to hosting DVM students on an ad-hoc basis to allow them to gain experience in Genomics research.

5. Infectious Disease and Immunology

The infectious disease and immunology programs at the CVM involve in excess of 30 faculty members with primary interests in virology, bacteriology, parasitology and immunology. Areas of strength include lentiviral pathology, infectious agents of livestock, and comparative immunogenomics as well as the nationally known vector-borne disease laboratory, directed by Dr. Ed Breitschwerdt. Faculty train graduate students participating in the Immunology Graduate Program and the Infectious Disease Concentration of the Comparative Biomedical Sciences Graduate Program. Many of these faculty members also participate in the Genomics Graduate Program and Biotechnology Training Program. Twenty-one of the faculty within the Emerging and Zoonotic Research Core in the Center for Comparative Medicine and Translational Research come from the CVM. The emphasis of this Core is to develop molecular diagnostic tools for bacterial and Rickettsial organisms, study the molecular basis of virulence among bacterial pathogens, improve biosecurity against infectious diseases in production animals, advance molecular epidemiology for the detection and spread of pathogens, study the basis and spread of antimicrobial resistance in bacteria, and develop novel vaccines. The CVM is currently seeking to expand the faculty dedicated to study infectious disease in livestock through a cluster-hire of six new tenure-track faculty members. Infectious disease faculty members are also leading the effort to locate the National Bio- and Agro-Defense Facility in North Carolina. This large core of faculty members is integral to providing state-of-the-art information and techniques to the professional student in the didactic curriculum and in research opportunities that are widely available through selectives and other laboratory research programs.

21.10.2. Describe up to two additional programs of potential (evolving) research development, explaining how they address emerging or new areas important to the profession.

Pain Research

The long-term mission of the Comparative Pain Research Laboratory (CPRL) is to improve our ability to manage pain in non-human species. We are doing this through investigation of valid ways to assess acute and chronic pain; through gaining a greater understanding of the neurobiological signature of pain in naturally occurring chronic diseases in animals; and through evaluation of novel analgesic treatments in surgical patients and naturally occurring painful diseases. To help achieve these aims, we collaborate with the Gastrointestinal Physiology Laboratory, Comparative Orthopedics Laboratory and Pharmacology Analytical Laboratory. So far, 11 veterinary students have worked in the CPRL and 19 research presentations have been made concerning the research conducted by this group of faculty and students.

Clinical Trials, currently under development

Clinical studies involving naturally occurring disease in animals are in important aspect of translational research. The Clinical Studies Core will consist of two interrelated areas – the Clinical Trials Center and the Clinical Genetics Resource Laboratory. The Clinical Trials Center will serve to facilitate clinical trials by providing organizational and technical support, as well as dedicated space to process samples in proximity to the VTH. It will provide 1) publicity for ongoing clinical studies and assistance with case recruitment, 2) technical assistance in obtaining and processing samples, with short-term (30-day) storage of samples, and 3) advice regarding clinical trial design and data analysis. The Clinical Genetics Resource Laboratory will provide oversight for a biospecimen repository of samples that will support ongoing and developing veterinary and translational research of CVM faculty. It will provide technical assistance in obtaining and banking samples in the most appropriate format based on established standard operating procedures , 2) management of the associated databases, and 3) expert advice, where needed, in the subsequent planning of genetic analyses of samples.

21.10.3. Provide evidence for the breadth and quality of the college research program, including:

21.10.3.a. The number of individual faculty members within each department involved in research, total research FTE and research productivity for the last 3 years.

See Appendix 10-1.

21.10.3.b. A description of other measures of faculty research activity (e.g. faculty participation and presentation of original research in scientific meetings, involvement of faculty in panels, advisory boards or commissions, and national and international research awards received).

See Appendix 10-2.

21.10.4. Describe the impact of the overall research program on the professional program and on professional students, including:

21.10.4.a. The percentage of professional students in the graduating class who have actively participated in research projects during their professional program.

The percentage of students participating in research in the class of 2006 was 21/75 (28%). Faculty research directly impacts DVM student education, as research findings are incorporated into course material.

21.10.4.b. A description of programs that facilitate veterinary student research and link professional and graduate education

There are three major programs that facilitate the research experiences for veterinary students. They are summarized below.

Veterinary Scholars Program

The goals of the Veterinary Scholars Program are to promote advanced study, research, and other scholarly activities of veterinary students, to encourage students to consider careers in academic or industrial veterinary medicine or comparative biomedical research; to enrich the foundation of veterinary practice with scientific principles, evidence based decision making, and problem solving skills; and provide opportunities for mentored

research experience. As part of the Program, the College offers a Summer Research Internship Program to first and second year DVM students. In the program, veterinary students have the opportunity to spend the summer doing mentored clinical or basic science research in any of a number of biomedical laboratories located within the College. This program is sponsored by the Merck-Merial Veterinary Scholars Program, the Fund for Discovery, the Center for Comparative Medicine and Translational Research, the NC Veterinary Medical Foundation, and the Office of the Associate Dean for Research.

The following numbers of veterinary students have actively participated in research projects as part of the Veterinary Scholars Program during their professional program:

# of Participants by Summer		# of Participants by Year of Graduation	
2002	23	2004	10
2003	23	2005	24
2004	17	2006	15
2005	21	2007	19
2006	19	2008	26

Clinician Scientist Focus Area (for a description of Focus Areas, see section 21.9.2)

This is a new Focus Area that started taking students in the Fall of 2005. The Clinician Scientist Focus Area (CSFA) provides veterinary students with research opportunities that combine clinical and basic science experiences, while still allowing students to choose an area of clinical focus. Students who wish to pursue careers involving basic science or clinical research, or those interested in pursuing academic careers as veterinary specialists will benefit from experiences in the CSFA. This focus area teaches fundamental skills of scientific critical thinking and communication (written and oral), gives exposure to bench and clinical research, and offers insight into non-traditional career choices involving research in veterinary medicine. Four students are currently enrolled in the CSFA.

Research Selectives

There are a number of research oriented selective offerings that allow students to explore the relationship between research and clinical medicine. These include:

- Intro to Research at the CVM
- Transgenics
- Biomedical Research Experience
- Embryo Biotechnology Research
- Tumor markers and experimental models in mammary gland cancer
- Immunodiagnostics

21.10.4.c. Plans for enhancing the impact of college research on the veterinary professional program.

As detailed above, we have recently developed the Clinician Scientist Focus Area and several new selectives. We plan on increasing the number and scope of the selectives. A DVM/PhD Program is in its initial planning stages. This is to be a seven to eight year integrated program for training veterinary clinician scientists. There are 17 participating graduate programs, from three NC State colleges (CVM, College of Agriculture and Life Sciences and College of Physical and Mathematical Sciences). The goal of the Combined DVM/PhD Program will be to address the critical need for veterinary researchers and academic clinicians.

Finally, we plan to update a number of basic science courses with additional information, especially concerning molecular medicine. For example, in physiology we are planning to have a section of the course which focuses on state-of-the-art technologies used to study physiology and pathophysiology. A number of basic and clinical science investigators will lecture about their current research studies as they relate to basic physiological mechanisms. This will give students the opportunity to hear about the research programs here at the CVM, as well as to broaden their knowledge base in the basic biomedical sciences.

21.11. Outcomes Assessments

21.11.1. Student outcomes.

Student educational outcomes must include, but are not limited to:

21.11.1.a. NAVLE (NBE and CCT) school score report data and passage rates over the past five years (Table A),

A. NAVLE Results

Class	Students Taking Exam	Students Passing Exam	Average Scores	Criterion Group Average	Percent Passing
2006	73	72	501	500	98.6%
2005	73	68	508	503	93.2%
2004	76	73	535	529	96.1%
2003	73	68	536	521	93.2%
2002	75	70	511	519	93.3%

21.11.1.b. student attrition rates with reasons (Table B),

B. Attrition

Class	Attrition	Reason for Relative Attrition		Absolute Attrition
		% Academic	% Personal	
2006	6*#	50.0%	50.0%	1
2005	7	57.1%	42.9%	2
2004	3*$	33.0%	67.0%	1
2003	1		100.0%	0
2002	4		100.0%	4

*Student conduct suspensions (one each in the classes of 2004 and 2006) are included in the academic category.

One personal Attrition is a student who took a planned one year period to work on his PhD and then joined the class of 2007

$ Includes a student who dropped out in first week of first year

21.11.1.c. employment rates of graduates (within one year of graduation),

See Appendices 11-1 and 11-2.

21.11.1.d. assessments of graduating seniors; and assessments of alumni at some post-graduation point (for example, three and/or five years post-graduation) assessing educational preparedness and employment satisfaction,

Senior student exit surveys (see Appendix 11-3) are conducted every year to assess the student's satisfaction with their education and to obtain data on their immediate plans after graduation. A survey of all graduates was undertaken in 1999 (see Appendix 11-1). As of 2005, we began annual sampling of graduates one year and 5 years post-graduation (see Appendix 11-2).

21.11.1.e. assessments of employers of graduates to determine satisfaction with the graduates

An annual employer survey was initiated in 2005. For the class of 2004, the response rate was low (10 responses). Each employer indicated that the diagnostic capabilities, medical knowledge and surgical skills of the alumnus were average or above. All employers indicted that they would hire another NCSU graduate. When

asked what areas of weakness the CVM might have addressed, no suggestion appeared more than once. Individual suggestions included providing more business management, communication skills, surgery skills, and practical clinical expertise.

21.11.1.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, and

See Appendix 11-4.

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21.11.1.g. additional assessment that might assist the college in benchmarking its educational program.

The overall curriculum content is monitored by the Assistant Dean of Academic Affairs and the Faculty Committee on Curriculum and Course Evaluation. Extramural learning opportunities are monitored through both the student's evaluation of the experience and the mentor's evaluation of the student and the experience. Faculty teaching ability is monitored by reviewing student instructor evaluations and peer evaluation of teaching. The quality of the faculty is demonstrated by the large number of invited continuing education programs performed and by external awards (see Appendices 11-5 and 11-6). The graduate and residency programs are monitored by the Comparative Biomedical Studies Graduate Studies Committee and the Committee on House Officer Programs, using tracking of the number of applicants for advanced training positions, programmatic reviews and exit interviews. Each individual residency program tracks the certification board pass rate for its residents and the employment opportunities.

The Hospital Board tracks the hospital caseload, hospital revenue, client satisfaction and referring veterinarian satisfaction. Maximizing the quality of the hospital experience exposes students to a busy, positive hospital environment. Each hospital rotation is evaluated using online course and instructor evaluations.

21.11.2. Institutional outcomes.

21.11.2.a. Describe how the college evaluates progress in meeting its mission (for example, benchmarking with other institutions, etc.).

The university planning process involves input from the faculty and the departments. Each department submits a three-year plan to the Dean and the Cabinet. The College then submits a three-year plan (called the Compact Plan) to the University. The latest plan was developed for the 2005-2007 period. This plan is reviewed annually, to assess progress and determine priorities (see Appendix 11-7). An example of how this plan is used is the recent initiative to bring NBAF to North Carolina (http://www.ncc-nbaf.org). In addition to the formal Compact Plan, the College held an administrative planning retreat in October 2006 to help determine the College goals for the next 10 years. Once faculty committees have designed implementation plans, concrete goals and timelines are determined.

The College provides data for the AAVMC Comparative Data Report. The College compares itself to other veterinary colleges in the Southeast (Auburn, University of Georgia, University of Tennessee, Virginia, Maryland, Louisiana State, Mississippi State), as well as to all veterinary colleges in North America (see Appendix 11-8). The College is in the enviable position of ranking # 5 in state appropriations and number of faculty, yet # 20 in DVM student numbers and # 28 in student tuition and fees. Of concern is the fact that starting salaries for faculty currently rank # 12. Although Raleigh also ranks # 12 for cost of living in locales with veterinary colleges, the value for salary in Raleigh is low (145/188 on the May 2005 Salary Value List, salary .com). The College recently ranked fourth in US News and World Report's ranking of veterinary colleges.

21.11.2.b. Describe the adequacy of resources and organizational structure to meet the educational purposes (dean should provide).

The College's financial resources are adequate. State appropriations have been relatively stable, with growth in resources coming from tuition revenue (particularly contract students), hospital revenue and sponsored program revenue. Future increases are unlikely to come from major increases in tuition, because of tight state controls, but might come from increasing numbers of students. Additional areas for income generation include state/private entrepreneurial partnerships and development opportunities.

The facilities are adequate to excellent. The new Research building is state of the art. The main College building has wireless computer access throughout the building, is undergoing renovation to upgrade HVAC systems and has undergone recent renovations in the cafeteria, library, student commons and the hospital. The major problem for the College is limited space to accommodate the programmatic growth that has occurred since the building was constructed. Planning for a new small animal hospital is well underway and plans are being developed for renovations to the large animal hospital, the current hospital space, and laboratory animal holding space. Numerous off-site facilities and partnerships provide exposure to a wide variety of animal species and practice types.

Faculty resources are excellent, both in terms of quality and quantity. The major concern is that strong private sector employment opportunities have created a challenging faculty retention and recruitment environment. Initiatives to meet this challenge include the Clinical Compensation Plan (which allows faculty to develop entrepreneurial efforts outside the teaching hospital), the introduction of flexible scheduling to allow faculty members more time to deal with family responsibilities, the creation of focused clinics that allow faculty to concentrate on cases related to their field of expertise and expansion of the faculty and resident pool to allow division of emergency duty among more individuals.

The College attracts highly qualified students (entry GPA average = 3.57) and admits 30-31% of in-state applicants and 4-5 % of out-of-state applicants. The absolute attrition rate is low (< 5%), and the NAVLE pass rate is high (5 year average = 95%). A high percentage of the graduates apply for internships (23-56%) and the acceptance rates are high (62-73%). The average salary of graduates has increased steadily ($47,875, with a $3,142 benefit package for the class of 2004). The 2005 employer survey indicated that employers are satisfied with the training received by graduates.

The organizational structure of the College has evolved to meet the challenge of programmatic expansion. When outside review found that the College's external affairs needed to be placed under the direction of a Cabinet level position, the position of Assistant Dean of College Relations was created. Within the office of Academic Affairs, an Assistant Dean position (with primary responsibility for curriculum matters), Director of Diversity, and a Clinical Counselor have been added. Two new staff positions were added to support the College's web-based activities. The Hospital Board has recently added a new Service Chief of Emergency and Critical Care to represent the expanding faculty in these areas. The Center for Comparative Medicine and Translational Research has recently hired a Director. The ongoing construction and management of the growth of the Centennial Bio-Medical Campus created a need for oversight. Dr. Olson will assume this role and a national search will be conducted to refill the position of Associate Dean of Research and Graduate Programs.

21.11.2.c. Describe outcomes assessed for college activities that are meaningful for the overall educational process (for example, scholarly activity of the faculty, faculty awards, faculty and staff perception of teaching resources, student satisfaction with the educational program, teaching improvement benchmarks, and others). If your program assesses other outcomes, briefly describe the results.

See Appendices 11-5 and 11-6

21.11.3. Clinical competencies outcomes

Veterinary graduates must have the basic scientific knowledge, skills and values to practice veterinary medicine, independently, at the time of graduation. At a minimum, graduates must be competent in providing entry-level health care for a variety of animal species.

The school/college must develop relevant measures and provide evidence that students/graduates have had adequate access to primary care cases and hands-on experiences with live animals during the clinical year and must address clinical competencies in the following areas:

1. comprehensive patient diagnosis (problem solving skills), appropriate use of clinical laboratory testing, and record management
2. comprehensive treatment planning including patient referral when indicated
3. anesthesia and pain management, patient welfare
4. basic surgery skills, experience, and case management

5. basic medicine skills, experience, and case management
6. emergency and intensive care case management
7. health promotion, disease prevention/biosecurity, zoonosis, and food safety
8. client communications and ethical conduct
9. strong appreciation for the role of research in furthering the practice of veterinary medicine

Provide a) the learning objectives for each of the nine listed competencies and b) a summary of the analysis of evidence-based data collected for each of the nine listed competencies used to assure that graduates are prepared for entry level practice (please note that a listing of core and elective blocks does not constitute evidence of learning).

Through faculty interviews, a list of learning objectives for the nine competencies was developed. The master list is detailed in Appendix 11-9 and is available to the students in a waterproof, pocket-sized book and on-line (http://www.cvm.ncsu.edu/studentservices/dvm_program/clinical_competencies/index.html). Beginning with the class of 2009, every student must be signed off on each core skill. The rationale for allowing students to get signed off on the skills throughout the four years, rather than having a capstone exam, was that spreading the documentation process over a longer period of time would reduce student stress regarding competency and allow them to see the progress in skill level over time. The advisor checks the book once each year to make sure that the student is making satisfactory progress. Because this is a new program and is spread out over the four years, we will not have complete documentation of observed competency for these skills until the class of 2009 graduates. We have, however, always had a skill sign off system for the skills taught in the Teaching Animal Unit. In the Introduction to Clinical Practice course (taught in third year), each student must demonstrate competence in basic surgery, anesthesia, physical exam, and diagnostic technique skills in a small group setting. In the Small Animal Community Classroom, competence must be demonstrated in basic small animal physical examination, small animal diagnostic techniques, routine medical knowledge, and surgery.

In addition to these direct measures, we also routinely survey both our graduates and our graduate's employers regarding clinical competency.

Describe how outcomes findings are used by the college to improve the educational program (give examples). Describe changes that were made in the curriculum based upon the competencies of your graduates.

The 1999 alumni survey and senior exit interviews guided improvements in the educational program through 2004. Since that time, the exit interviews, data gathered in the 2005 alumni survey, the 2005-2006 employer survey and the 2006 faculty survey have helped to guide changes and to assess if changes made between 1999 and 2005 have had an impact. In particular:

The need for more experience in surgery

- The entire large and small animal surgery faculty designed an integrated 4 year plan for teaching surgery skills and implemented the entire plan by 2000-2001.The 3rd year surgery course was moved to 2nd year in the 1998-1999 year, which allowed all classes from 2001 onwards an additional year of surgery experience. Surgery was added to the 3rd year Introduction to Clinical Practice course, and the 3rd year Large Animal Surgery course was converted to an Advanced Principles of Surgery course. Psychomotor skills training was incorporated into the Life Skills Program (prior to 1st year), emphasized in anatomy dissection, and reinforced at the end of second semester 1st year. Synthetic and cadaver models were developed and utilized for teaching specific surgery skills.
- Dr. Kelli Ferris was hired in 1999 to start a community practice and mobile spay/neuter clinic. Students are allowed to participate on a volunteer basis once they have completed the 2nd year course. A 4th year rotation that incorporated high volume spay/neuter was developed. Recently, this program has become centered at the Wake County Shelter and a second instructor, Dr. Brenda Stevens has been added.
- Dr. Kyle Mathews began an Advanced Surgery selective in 2004.
- In the 2005 alumni survey, the number of students who felt that they were poorly prepared for surgery fell from 13 mentions (Class of 2000: pre-change) to five mentions (Class of 2004: post-change) and the nature of the comments changed (Class of 2004: not well prepared for surgeries other than spay/neuter).

The need for more business/jurisprudence training

- A selective on Success in Business was developed in 1999. The faculty voted to make this selective a requirement for all students in 2004, which was implemented for the Class of 2008.
- Two undergraduate business courses (6 credits) were added as prerequisites in 2001.

The need for communication training

- Dr. Greg Lewbart developed a selective in Communication and client counseling.
- Dr. Laurel Williams and Dr. Mat Gerard attended the Bayer Communications Workshops to prepare for increased communication training of students. They began offering a selective in communication in Fall 2005, which replaced the Communication and Client Counseling selective.
- In the past, English literature courses were accepted for the six credit prerequisite requirement in English composition and/or public speaking. Currently, only courses that demonstrate proficiency in verbal and written communication are being accepted.

The need for more hands-on training

- Several selectives were developed that offered hands-on training including Equine Dentistry, Small Animal Dentistry, Clinical Techniques (Medical and Surgical Treatments), Sample Collection and Interpretation, Physical Therapy and Rehabilitation, and Large Animal Endoscopy.
- The 3rd year Introduction to Clinical Practice course includes intensive training (3 students/1 instructor) using fresh cadavers.
- The Clinical Competency book was implemented in 2005, beginning with the class of 2009. This four-year program documents that each student performs basic "must-learn" skills.

The need for more primary care

- Community classroom selectives and 4th year rotations were developed for both large and small animal. The 4th year small animal program originally utilized practice experiences, but is now taught entirely at the Wake County shelter, where a more uniform educational experience can be designed. This program has two full time instructors, Dr. Kelli Ferris and Dr. Brenda Stevens. The large animal program utilizes a tightly structured extramural study experience, run by Drs. Malcolm Roberts and Richard Mansmann.
- The Wellness Clinic, a Saturday primary care experience in the small animal teaching hospital, was opened in 2004. This clinic uses students from years 1-3 to provide routine health care to CVM personnel.
- One primary care rotation is a core rotation in the focus area system.

The need for emergency training

- The small animal emergency service was initiated in 2004. A day emergency service is currently being implemented.
- One emergency/critical care rotation is required of all students. There are options for both large and small animal experience.

The need to allow earlier specialization

- Selectives (implemented in Fall 1997) were the first attempt to allow training in specialized areas. The 2005 alumni survey indicated that most students found these courses to be a valuable experience.
- In the 2003 curricular vote, the faculty voted to develop focus areas. A focus area system was implemented in the 2004-2005 school year. The 4th year curriculum was specifically changed to allow specialization. Within the focus area system, there is also the opportunity to develop selectives and electives for focused training of students in years 1-3.
- A focus area based extramural studies program was implemented in 2006.

Other course issues raised in surveys

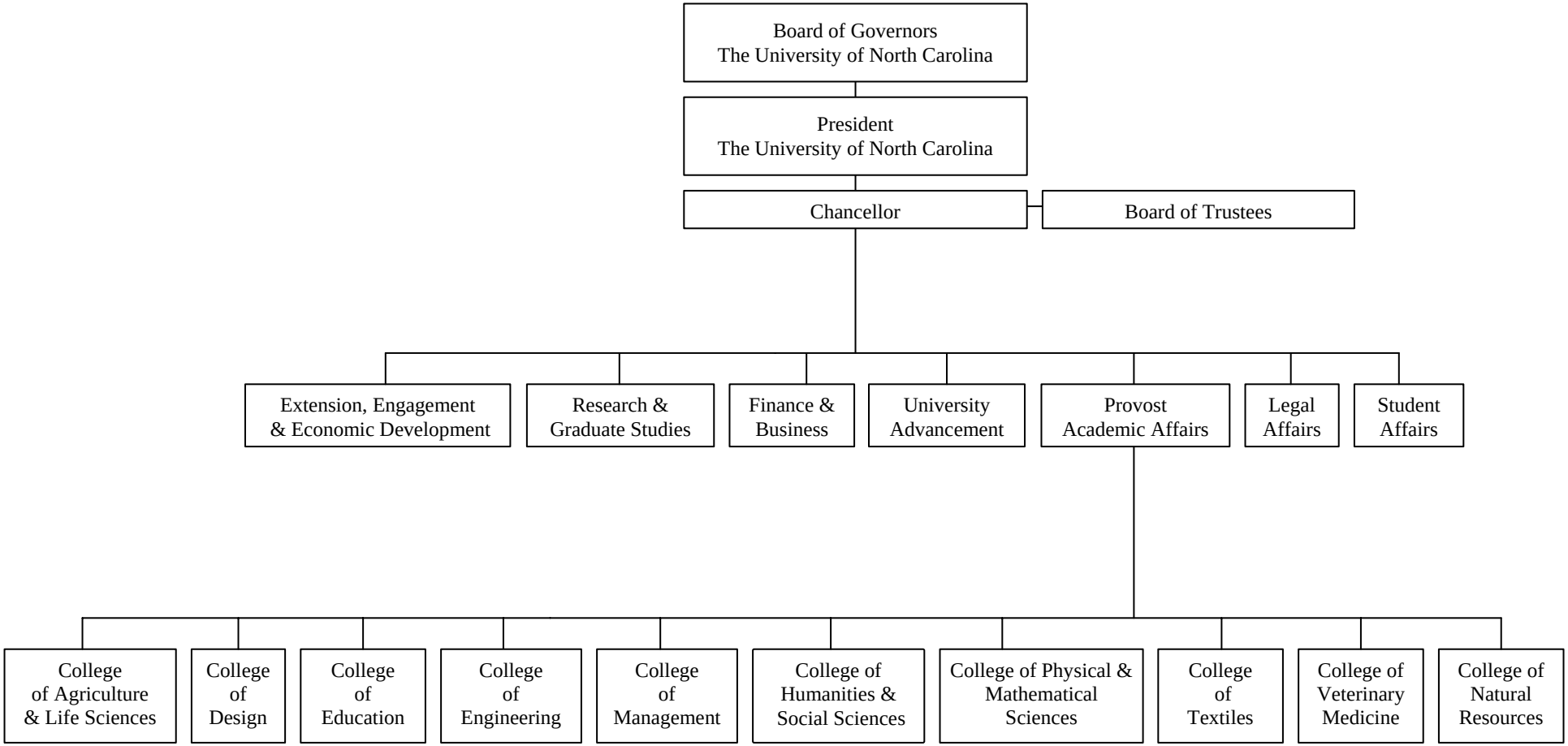
- A small animal dentistry selective was added in 2002. A companion animal dentist, Dr. William Krug, was hired in 2006. The equine dentistry selective is a required course for students in the equine focus area.
- Animal nutrition will become a prerequisite as of 2008 admissions cycle. A veterinary nutritionist was hired in 2006.
- A number of courses that students did not find particularly helpful have been reorganized (Toxicology, Epidemiology/Public Health).
- The number of technicians in the hospital has been doubled over the last several years to remove students from overnight emergency/critical care duty and to allow students more time to learn case management, rather than being used as technical help. It is the philosophy of the College that student labor should not be used to run the hospital, and that students should be focusing on veterinary knowledge and skills rather than technician skills.

Facilities and equipment issues raised in the surveys

- The College's first space priority was the research building. This was completed in 2004.
- The next space priority is the building of a new small animal hospital, which is scheduled to begin in 2008. Each service will have new clinical rounds room space in the new hospital. In the meantime, clinical rounds spaces are being created for each service, which helps to relieve the need for small teaching rooms for rounds.
- Once the hospital moves, portions of the current hospital will be used to create new instructional space. In the mean time, courses are being scheduled to minimize the use of D-239.
- Ten small teaching rooms have been equipped with upgraded AV equipment
- The Mobile Computing Initiative started in 2001 with distribution of hardware to the 4th year class only and wireless coverage in teaching, common and selected areas of the hospital. The program expanded to all DVM students in 2003 and to all House Officers in 2006. The wireless upgrade to cover the entire main building was completed in fall 2006. Currently, there are approximately 475 Palm handheld computers in the hands of students, faculty and staff throughout CVM. The curricular committee recently approved a laptop requirement for future classes. This requirement needs further development before its implementation.
- The biomedical communications and information technology personnel are being integrated into a single unit and two new people have been hired to improve the College's web presence, including the development of web-based instructional material.
- Temperature control in several of the classrooms remains a problem, despite the new heating/cooling renovation.

It is anticipated that once we begin to have classes graduating under the focus area/clinical competency systems (Class of 2009), we will be able to make direct changes in the clinical competency skills list. The needs of the students for developing clinical competency will be balanced by time and labor constraints. For example, when we first implemented the changes in surgical training, we set a goal of having each student perform 20 elective surgeries prior to graduation. We had exceptional students who graduated with as many as 60 surgeries, but found that a core requirement of 10 surgeries for each student was practical and could be completed by students in all focus areas. We anticipate that the use of the Clinical Competencies check list will allow us to remedy any problems in training in a timely and practical manner.

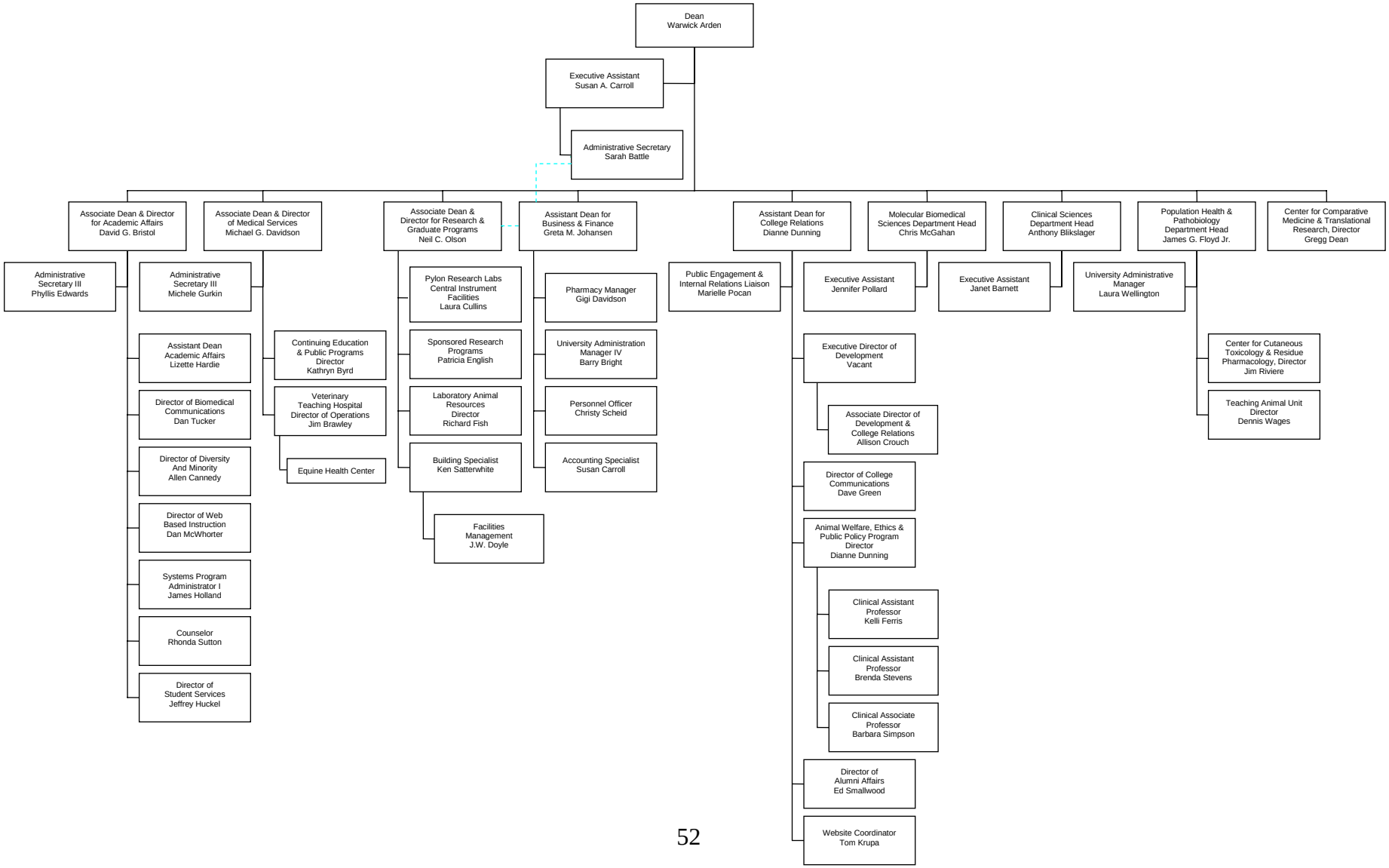
APPENDIX 1-1: ORGANIZATIONAL CHART OF NORTH CAROLINA STATE UNIVERSITY



An extended NCSU organizational chart is located at http://www2.acs.ncsu.edu/UPA/uniorgchart/chart.pdf

Chancellor	James L. Oblinger
Provost and Vice Chancellor for Academic	Larry A. Neilsen
Vice Chancellors	
James J. Zuiches	Extension, Engagement and Economic Development
Charles Leffler	Finance and Business
Mary Elizabeth Kurtz	Legal Affairs (also General Counsel)
John G. Gilligan	Research and Graduate Studies
Thomas H. Stafford, Jr.	Student Affairs
Terry G. Wood	University Advancement
Denis Jackson	Assistant Vice Chancellor
Vice Provosts	
Katie Perry	Senior Vice Provost, Office of the Provost
Tom Miller	Distance Education and Learning Technology Applications
José Picart	Diversity and African-American Affairs
Louis Hunt	Enrollment Management and Services
Joanne Woodard	Equal Opportunity and Equity
Sam Averitt	Information Technology Division
Bailian Li, Interim	International Affairs
Susan Nutter	NCSU Libraries
Deans	
Johnny C. Wynne	Agriculture and Life Sciences
Marvin J. Malecha	Design
Kathryn Moore	Education
Louis A. Martin-Vega	Engineering
Terri Lomax	Graduate School
Toby L. Parcel	Humanities and Social Sciences
Ira R. Weiss	Management
Robert D. Brown	Natural Resources
Daniel L. Solomon	Physical and Mathematical Sciences
Blanton Godfrey	Textiles
Thomas E. H. Conway, Jr.	Undergraduate Academic Programs
Warwick Arden	Veterinary Medicine
Faculty Senate	
Nina S. Allen	Chair
Robert Bruck	Secretary

APPENDIX 1-2: ORGANIZATIONAL CHART OF THE COLLEGE OF VETERINARY MEDICINE



Dean	Warwick Arden, BVSc, PhD, DACVS
Associate Deans	
David G. Bristol, DVM, DACVS, DABVP	Academic Affairs
Michael G. Davidson, DVM, DAVCO	Veterinary Medical Services and Continuing Education
Neil C. Olson, DVM, PhD, DACVS	Research and Graduate Programs, Biomedical Centennial Campus
Assistant Deans	
Dianne Dunning, DVM, MS, DACVS	College Relations
Elizabeth M. Hardie, DVM, PhD, DACVS	Academic Affairs
Greta M. Johansen, MBA	Business and Finance
Department Heads	
Anthony Blikslager, DVM, PhD, DACVS	Clinical Sciences
Chris McGahan, PhD	Molecular Biomedical Sciences
James G. Floyd, Jr., DVM, MS, DACT	Population Health and Pathobiology
Directors	
Gregg Dean, DVM, PhD, DACVP	Center for Comparative Medicine and Translational Research
Allison L. Crouch, Interim	Development and College Relations
Jim Riviere, DVM, PhD	Center for Chemical Toxicology Research and Pharmacokenetics
Faculty Senators	
Lloyd Fleisher, PhD	
Sam Jones, DVM, PhD, DACVIM	

APPENDIX 1-3: CVM COMMITTEES

Faculty Committee on Academic Performance and Student Conduct: This committee is composed of 10 members: one faculty member elected from each of the three departments and one elected from the faculty at large, one student elected from each class, one elected postdoctoral trainee, and the Associate Dean of Academic Affairs (ex-officio). The specific responsibilities of the committee include formulation, recommendation and implementation of policies and procedures regarding those aspects of student academic performance and student conduct pertinent to the professional and educational development of the student. The committee is responsible for adhering to the guidelines set forth by the academic standards and student conduct documents of the CVM, and to recommend courses of action related to student conduct and academic performance issues

Faculty Committee on Awards and Scholarship: This committee is composed of four members: three faculty representatives, one elected from each department for three-year staggered terms, and the Associate Dean and Director for Academic Affairs (ex-officio). The responsibilities of this committee are to establish award policies, to define recipient criteria and to expedite selection procedures for all CVM student and faculty awards. The committee elects one of its members to represent the CVM for University awards and scholarship purposes.

Faculty Committee on Admissions: This committee is composed of at least 18 members. Each department elects four members to the committee. The remainder of the committee includes: the President of the NCVMA or his/her designee; one representative from the NCSU College of Agriculture and Life Sciences (recommended by the Dean); one member-at-large from the University of North Carolina system appointed by the Dean; the Associate Dean and Director for Academic Affairs at the CVM; the Director of Student Services; and the Director of Diversity and Minority Affairs. This committee recommends policy and admission criteria for admitting candidates to the professional veterinary program. This committee also recommends pre-professional course requirements relevant to the program in general. Additionally, the committee is responsible for regular review of admission procedures. It is the function of this committee to make recommendations to the Dean for each student to be admitted to the professional program.

Faculty Committee on Curriculum and Course Evaluation: This committee is composed of 13 members. Two faculty members are elected from each department and one student is elected from each class. In addition, the Associate Dean and Director for Academic Affairs, the Assistant Dean of Academic Affairs and the CVM representative to the Administrative Board of the Graduate School serve as ex-officio members. Each department and class also appoints an alternate member, who may attend any and all meetings and serves as a voting member in the absence of an elected member from the respective department or class. The function of this committee is confined to matters of the professional DVM curriculum and to the periodic review of those course offerings. The responsibilities of the committee are to recommend to the faculty curricular content and program development and to conduct ongoing reviews of all DVM courses.

Faculty Committee on House Officer Programs: This committee is composed of 11 members. Elected members of the committee include seven members of the faculty who are involved in house officer training (three members from the Department of Clinical Sciences; two members from the Department of Population Health and Pathobiology; two members from the Department of Molecular Biomedical Sciences) plus two residents. The Associate Dean and Director for Veterinary Medical Services and the Director of Student Services serve as ex-officio, nonvoting members. The responsibility of this committee is to evaluate internships and residency programs, and is advisory to the Associate Dean and Director for Veterinary Medical Services.

Faculty Committee on Library and Education Resources: This committee is composed of 10 members: the Librarian, one faculty member elected from each department, one student elected from each class, one elected graduate student representative (ex-officio), and a representative appointed by the Dean. Members serve three-year terms. The responsibility of this committee is to recommend policy relating to all library and audiovisual decisions. This encompasses establishment of ordering priorities, hours of the library, recommending upgrades and maintenance of library furniture and equipment, continued review of current accessions, publication list updates and recommendation of general budget factors to the appropriate bodies. The function of the committee is to establish user-focused services and programs for all library users, including departments, faculty, students and visitors utilizing the CVM facilities and materials.

Faculty Committee on Research: This committee is composed of nine faculty members appointed by the Dean, three from each department. Members serve three-year staggered terms. The Director of Laboratory Animal Resources and the Associate Dean and Director for Research and Graduate Studies serve as permanent, ex-officio, non-voting members. The CVM representatives on the University Research Committee, if they are not already departmental faculty members on this committee, serve as ex-officio, non-voting members. The responsibility of the committee is to evaluate research proposals for scientific merit and feasibility in regard to facilities and expertise. The committee serves as a source of information on funding available for research, and provides recommendations on priorities and distribution of unrestricted research funds. It also provides advice on the use of facilities, purchases of equipment and recruitment of technical staff for general counsel in recommending long- and short-range direction for research efforts of the CVM. The committee oversees use and policies related to all central research facilities, including Laboratory Animal Resources (LAR) and the Central Procedures Laboratory. The committee advises the Director of LAR and the Associate Dean for Research on programmatic directions and fee schedules, and how best to meet the needs of faculty using these facilities.

Faculty Committee on Veterinary Faculty Practice Plan (VFPP): This committee is composed of 10 members: the Dean or his/her designee as chair, the three Department Heads, the Associate Dean and Director for Veterinary Medical Services, the Hospital Administrator, one faculty member elected from each department for a three-year nonrenewable term, and one faculty member elected at-large from all clinical faculty for a two-year nonrenewable term. The committee advises the Dean on matters relating to management and operation of the VFPP.

Hospital Board: The Hospital Board is composed of 15 members. Permanent, ex-officio members include the Associate Dean and Director for Veterinary Medical Services, the Hospital Administrator, the Assistant Dean for Business and Finance, and four staff members appointed by the Associate Dean and Director for Veterinary Medical Services. One additional staff member elected by the staff sits on the Hospital Board for a two-year term on a rotating basis. The other elected members on the Hospital Board are the seven Service Chiefs. Service Chiefs serve three-year terms at staggered intervals and may succeed themselves. The services represented are equine medicine and surgery, small animal surgery, small animal medicine specialty services, small animal emergency/critical care, radiology/anesthesiology, farm animal specialty and field services, and clinical laboratory services. It is the Board's responsibility to establish and review the practices and policies of the hospital. The Board examines and recommends standard fees for hospital and professional services, reviews professional standards and performance, and grants and approves faculty hospital privileges; the Board is in effect the governing body of the hospital.

Comparative Biomedical Sciences (CBS) Graduate Studies Committee: This committee is composed of 12 members: one member of the CVM graduate faculty elected from each of the five recognized CBS areas of concentration (Cell Biology, Infectious Disease, Pathology, Pharmacology and Population Medicine), two at-large members elected by the entire CBS graduate faculty, the CBS Director of Graduate Programs, two elected graduate students, the Director of Student Services, and the CVM representative to the Administrative Board of the Graduate School. The Director of Student Services and the Administrative Board of the Graduate School representative serve as ex-officio, non-voting members. It is the responsibility of this committee to develop and evaluate the CBS graduate program, develop CBS graduate courses, and review and vote upon all admissions to the CBS graduate program. The committee and the Directors of the Immunology and Physiology graduate programs (or their chosen representatives) review all applications for CVM stipends, prioritize them, and submit this prioritized list to the Associate Dean and Director of Research and Graduate Studies for final dispensation.

Faculty Committee on Reappointment, Promotion and Tenure: This committee is composed of eight members: two members elected from each department and two members elected at-large. Membership on the committee is restricted to faculty holding the rank of Professor. The responsibilities of this committee are to examine and vote on the dossiers of faculty being considered for reappointment, promotion without tenure, and promotion with granting of tenure.

APPENDIX 2-1: FINANCES - TABLES A & B

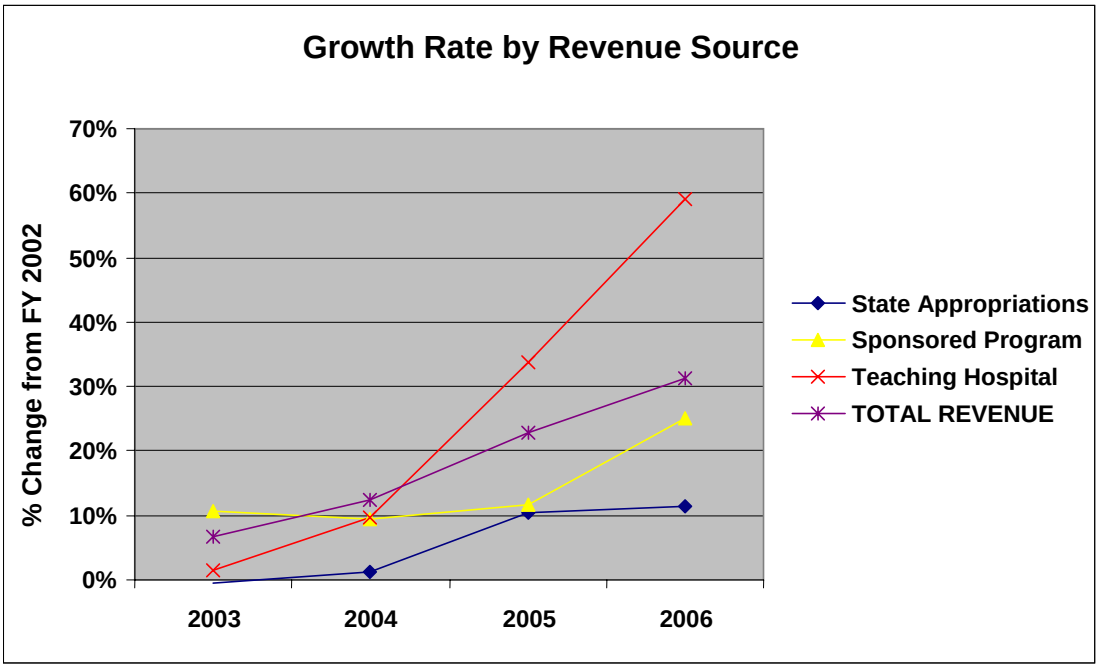
TABLE A - TOTAL EXPENDITURES FOR IMMEDIATE PAST 5 FISCAL YEARS - Direct and Indirect Expenses

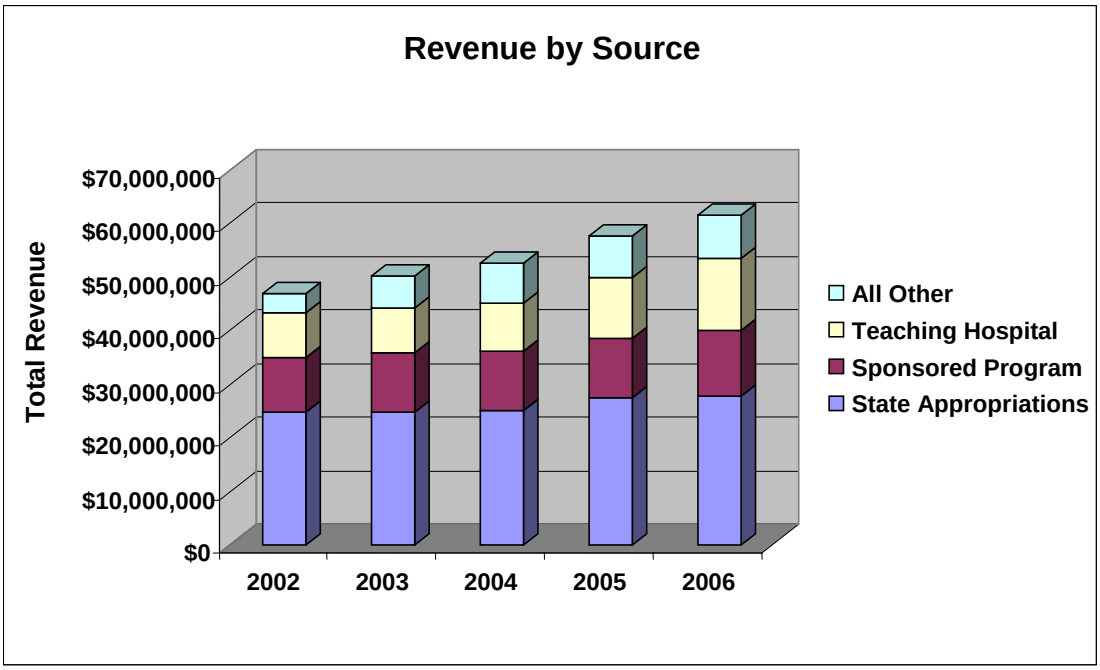
Fiscal Year	Instruction	Academic Support	Student Services	Services of Educational Activity				Un-sponsored Student Aid	Sponsored Student Aid	Sponsored Research	Other Sponsored Activity	Ext & Public Service	TOTAL DIRECT EXPENSES
				Teaching Hospital	Diagnostic Lab	Other							
						Amount	Type						
2006	$17,363,900	$8,359,947	$296,850	$13,754,541	-	$982,298	-	$456,232	$276,953	$12,391,995	$2,349,646	$463,718	$56,696,079
2005	$17,022,598	$8,432,060	$266,053	$12,917,823	-	$717,514	-	$435,077	$139,001	$10,655,075	$2,498,105	$286,065	$53,369,371
2004	$15,104,378	$7,977,246	$257,866	$10,490,171	-	$511,473	-	$508,448	$238,834	$11,053,629	$2,102,821	$261,976	$48,506,842
2003	$16,233,695	$5,799,403	$220,403	$9,270,986	-	$735,098	-	$437,381	$214,897	$11,202,927	$2,518,573	$163,698	$46,797,061
2002	$16,221,542	$5,688,337	$203,661	$9,108,746	-	$734,696	-	$425,281	$186,959	$10,139,250	$2,261,236	$29,588	$44,999,297
% Change	7.04%	46.97%	45.76%	51.00%	-	33.70%	-	7.28%	48.14%	22.22%	3.91%	1467.25%	25.99%

TABLE B - COLLEGE REVENUE (Sources of funds) - FROM ALL SOURCES FOR IMMEDIATE PAST 5 FISCAL YEARS

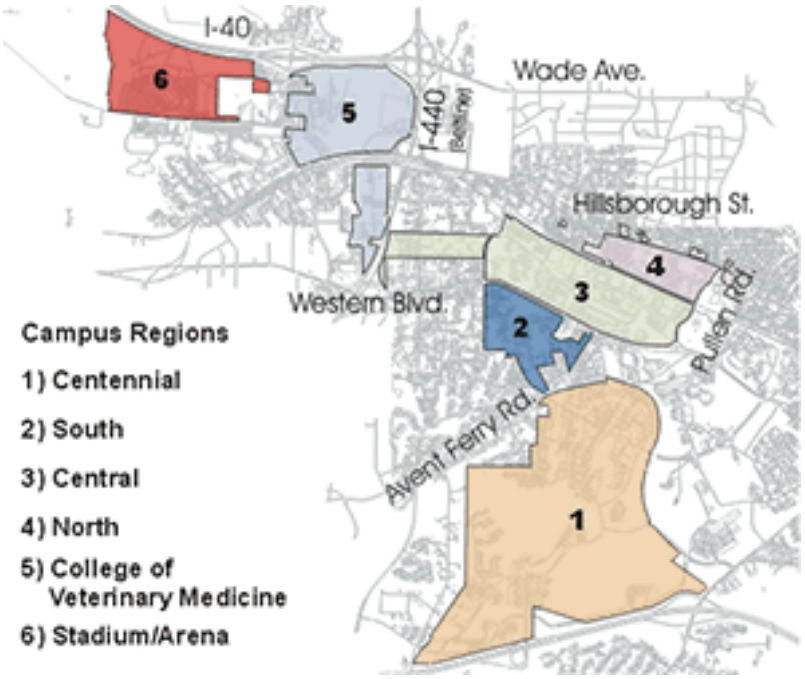
Fiscal Year	State Appropriations	Tuition & Fees	Is Tuition Estimated Amount?	Endowment Income (current year)	Gifts for Current Use	Sponsored Program Income /Cost Recovery	Other	SALES and SERVICES			Reserves and Transfers	TOTAL REVENUE
								Teaching Hospital	Diagnostic Lab	Other Sources from Sales & Services		
2006	$27,597,889	-	-	$536,857	$3,736,920	$12,441,541	$2,094,354	$13,339,818	-	$1,403,693	$3,104,621	$64,255,693
2005	$27,393,226	-	-	$475,047	$3,418,326	$11,099,559	$1,008,090	$11,212,242	-	$1,503,569	$4,014,327	$60,124,386
2004	$25,074,586	-	-	$399,611	$1,903,239	$10,880,981	$1,590,881	$9,191,514	-	$1,638,326	$4,073,434	$54,752,572
2003	$24,663,352	-	-	$263,246	$1,987,584	$11,002,246	$1,473,286	$8,513,439	-	$1,290,113	$3,177,897	$52,371,163
2002	$24,785,305	-	-	($589,571)	$1,449,580	$9,948,898	$1,083,577	$8,379,331	-	$1,430,757	$1,782,824	$48,270,701
% Change	11.35%	-	-	-191.06%	157.79%	25.05%	93.28%	59.20%	-	-1.89%	74.14%	33.12%

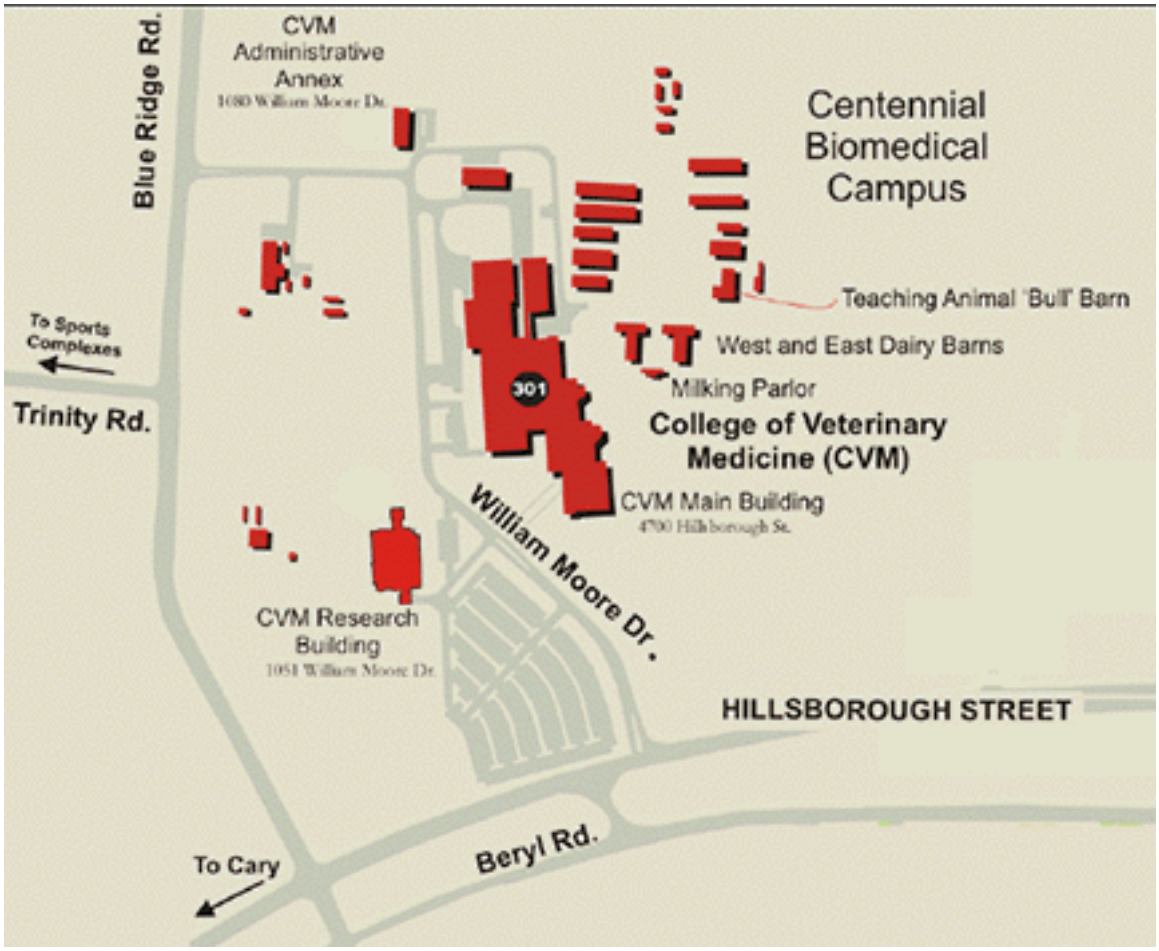
APPENDIX 2-2: TREND ANALYSIS OF COLLEGE REVENUES



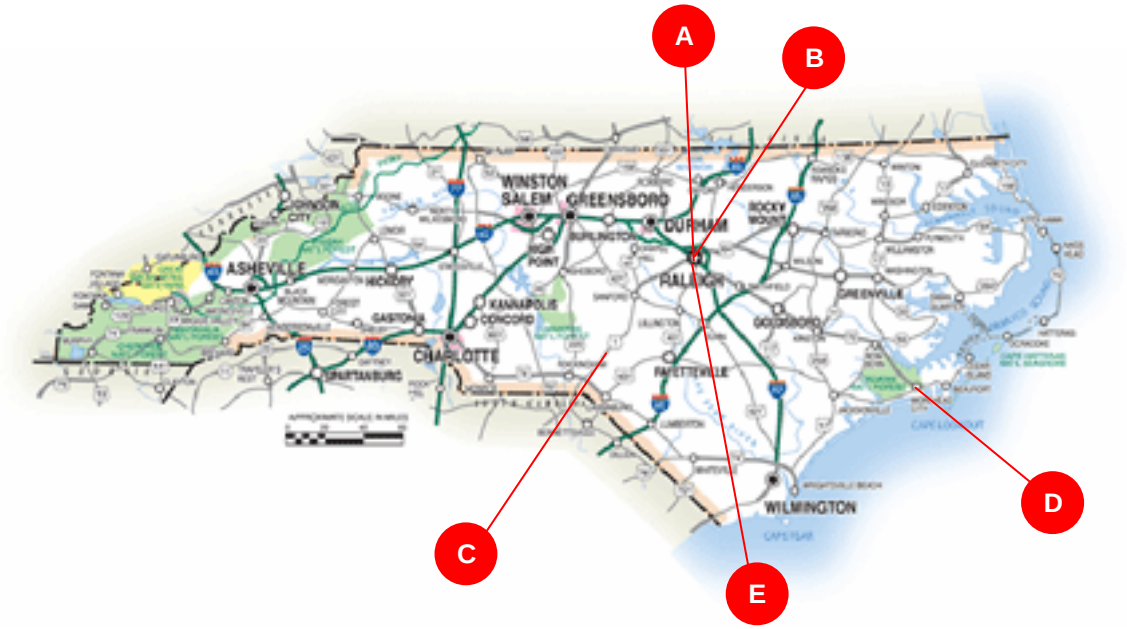


APPENDIX 3-1: LOCATION OF THE COLLEGE OF VETERINARY MEDICINE ON THE NCSU CAMPUS





APPENDIX 3-2: LOCATION OF ON- AND OFF- CAMPUS FACILITIES OF THE COLLEGE OF VETERINARY MEDICINE



A. CVM Main Campus
4700 Hillsborough Street
Raleigh, NC 27606

B. Wake County Animal Care, Control and Adoption Center
820 Beacon Lake Road
Raleigh, NC 27610

C. Equine Health Center at Southern Pines (EHC-SP)
6045 US Highway #1 North
Southern Pines, NC 28387

D. Center for Marine Sciences and Technology (CMAST)
303 College Circle
Morehead City, NC 28557

E. University Field Laboratories
Located throughout the state,
Most commonly used site is on
Lake Wheeler Road
Raleigh, NC

APPENDIX 4-1: CLINICAL RESOURCES - Tables A, B, & C

Table A - Teaching Hospital (Corresponds with AAVMC Survey 22)			
2005-2006			
Animal Species	**No. of Patient Visits**	**No. Hospitalized**	**No. of Hospital Days**
Bovine	88	32	127
Canine	13635	2969	11962
Caprine	52	27	117
Equine	2506	1211	8555
Feline	2772	712	2931
Ovine	11	8	28
Porcine	14	5	43
Caged Pet Birds	7	3	12
Caged Pet Mammals	57	17	118
Avian Wildlife	0	0	0
Other	138	74	354
Total	19280	5058	24247

No. of Patient Visits - total number of times the patient visits the hospital (if Buffy visits the hospital 3 times this year, this would count as 3 visits.)

No. Hospitalized - number of patients that were hospitalized.

No. of Hospital Days - cumulative days that the total number of patients were hospitalized.

Table A - Teaching Hospital			
2004-2005			
Animal Species	**No. of Patient Visits**	**No. Hospitalized**	**No. of Hospital Days**
Bovine	42	17	69
Canine	12662	2707	10971
Caprine	30	16	63
Equine	2367	1070	7138
Feline	2443	577	2479
Ovine	5	2	6
Porcine	12	7	98
Caged Pet Birds	22	2	5
Caged Pet Mammals	18	5	19
Avian Wildlife	0	0	0
Other	157	68	242
Total	17758	4471	21090

Table A - Teaching Hospital			
2003-2004			
Animal Species	**No. of Patient Visits**	**No. Hospitalized**	**No. of Hospital Days**
Bovine	104	35	154
Canine	11990	2387	10469
Caprine	31	17	101
Equine	2044	998	6914
Feline	2323	549	2460
Ovine	8	3	15
Porcine	4	3	12
Caged Pet Birds	208	38	127
Caged Pet Mammals	14	6	19
Avian Wildlife	0	0	0
Other	167	67	165
Total	16893	4103	20436

Table A - Teaching Hospital			
2002-2003			
Animal Species	**No. of Patient Visits**	**No. Hospitalized**	**No. of Hospital Days**
Bovine	146	70	194
Canine	12228	2337	5359
Caprine	48	19	62
Equine	1853	908	5121
Feline	2574	485	1021
Ovine	5	4	13
Porcine	21	4	13
Caged Pet Birds	406	59	148
Caged Pet Mammals	160	18	51
Avian Wildlife	0	0	0
Other	16	4	15
Total	17457	3908	11997

Table A - Teaching Hospital			
2001-2002			
Animal Species	**No. of Patient Visits**	**No. Hospitalized**	**No. of Hospital Days**
Bovine	120	42	123
Canine	12002	2311	5745
Caprine	33	8	18
Equine	2051	1026	6155
Feline	2434	386	1040
Ovine	8	1	2
Porcine	9	5	12
Caged Pet Birds	373	46	148
Caged Pet Mammals	141	27	87
Avian Wildlife	0	0	0
Other	31	13	52
Total	17202	3865	13382

Table B - Ambulatory/Field Service Program (Corresponds with AAVMC Survey 23)		
2005-2006		
Animal Species	**# of Farm (site) Calls**	**# of Animals Examined/Treated**
Bovine	289	10604
Caprine	65	814
Equine	86	435
Ovine	14	577
Porcine	19	102879*
Other	240	1822355*
Totals	713	1937664

Number of Farm (site) Calls - total number of calls/visits made to farm/operations.

Number of Animals Examined/Treated - number of individual animals examined/treated.

*Indicates number of "at risk" swine and poultry examined.

Table B - Ambulatory/Field Service Program		
2004-2005		
Animal Species	**# of Farm (site) Calls**	**# of Animals Examined/Treated**
Bovine	282	9795
Caprine	71	287
Equine	86	441
Ovine	18	6
Porcine	7	4000
Other	144	3514
Totals	608	18043

Table B - Ambulatory/Field Service Program		
2003-2004		
Animal Species	**# of Farm (site) Calls**	**# of Animals Examined/Treated**
Bovine	287	7792
Caprine	75	315
Equine	153	218
Ovine	11	35
Porcine	23	222
Other	127	103
Totals	676	8685

Table B - Ambulatory/Field Service Program		
2002-2003		
Animal Species	**# of Farm (site) Calls**	**# of Animals Examined/Treated**
Bovine	223	9748
Caprine	36	467
Equine	85	578
Ovine	22	508
Porcine	1	100
Other	87	93566
Totals	454	104967

Table B - Ambulatory/Field Service Program		
2001-2002		
Animal Species	**# of Farm (site) Calls**	**# of Animals Examined/Treated**
Bovine	199	11933
Caprine	35	742
Equine	75	388
Ovine	4	64
Porcine	3	6
Other	49	341
Totals	365	13474

Table C - Herd/Flock Health Program (Corresponds with AAVMC Survey 24)				
2001-2002				
	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)	
	Yes or No	# of sites	Yes or No	# of sites
Dairy	Y	2	Y	10
Beef Feedlots	N	0	Y	2
Cow-Calf	Y	2	Y	35
Small Ruminants	Y	3	Y	14
Swine	Y	2	Y	50
Poultry	Y	2	Y	30
Fish	N	N/A	Y	1
Equine	Y	1	N	N/A
Other	N	N/A	N	N/A

Table C - Herd/Flock Health Program				
2002-2003				
	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)	
	Yes or No	# of sites	Yes or No	# of sites
Dairy	Y	2	Y	10
Beef Feedlots	N	0	Y	2
Cow-Calf	Y	2	Y	25
Small Ruminants	Y	3	Y	12
Swine	Y	2	Y	50
Poultry	Y	2	Y	25
Fish	N	N/A	Y	1
Equine	Y	1	N	N/A
Other	N	N/A	N	N/A

Table C - Herd/Flock Health Program				
2003-2004				
	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)	
	Yes or No	# of sites	Yes or No	# of sites
Dairy	Y	2	Y	10
Beef Feedlots	N	0	Y	2
Cow-Calf	Y	2	Y	20
Small Ruminants	Y	3	Y	14
Swine	Y	2	Y	50
Poultry	Y	2	Y	30
Fish	N	N/A	Y	1
Equine	Y	1	N	N/A
Other	N	N/A	N	N/A

Table C - Herd/Flock Health Program				
2004-2005				
	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)	
	Yes or No	# of sites	Yes or No	# of sites
Dairy	Y	2	Y	10
Beef Feedlots	N	0	Y	2
Cow-Calf	Y	2	Y	20
Small Ruminants	Y	3	Y	10
Swine	Y	2	Y	50
Poultry	Y	2	Y	10
Fish	N	N/A	Y	1
Equine	Y	1	N	N/A
Other	N	N/A	N	N/A

Table C - Herd/Flock Health Program				
2005-2006				
	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)	
	Yes or No	# of sites	Yes or No	# of sites
Dairy	Y	2	Y	15
Beef Feedlots	N	0	Y	2
Cow-Calf	Y	2	Y	3
Small Ruminants	Y	3	Y	6
Swine	Y	2	Y	70
Poultry	Y	2	Y	111
Fish	N	N/A	Y	1
Equine	Y	1	N	N/A
Other	N	N/A	N	1

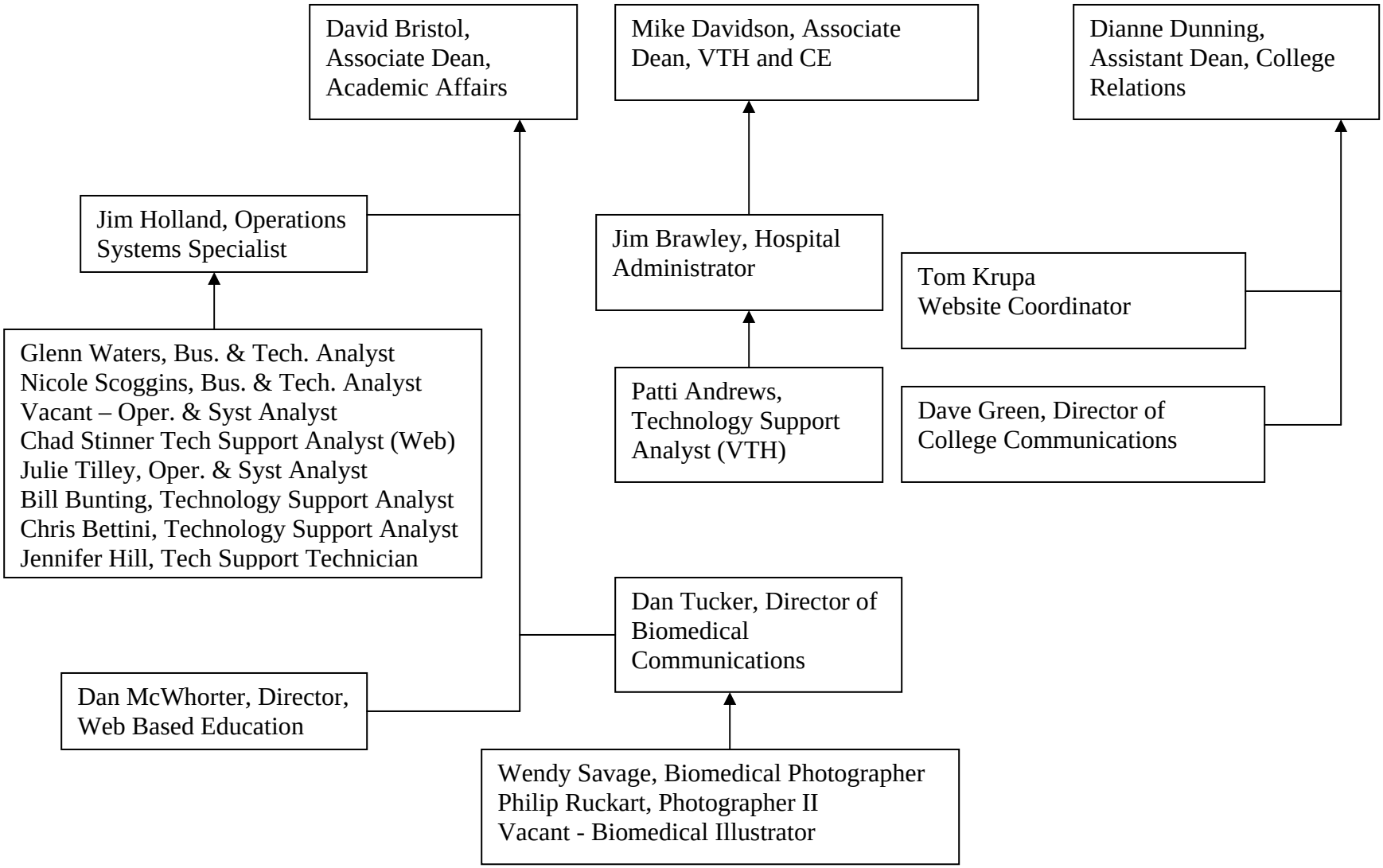
APPENDIX 4-2: CLINICAL RESOURCES - TREND ANALYSIS

Clinical Caseload Trends 2001-2006					
Species	**% change over last five years**	**% change 05-06 vs 04-05**	**% change 04-05 vs 03-04**	**% change 03-04 vs 02-03**	**% change 02-03 vs 01-02**
Bovine	-26.6%	-0.1%	-59.6%	-28.8%	+16.6%
Canine	+13.6%	+29.2%	+5.6%	-1.9%	+1.9%
Caprine	+57.6%	+73.3%	-3.2%	+9.4%	+45.5%
Equine	+22.2%	+17.1%	+18.7%	+17.5%	-9.7%
Feline	+13.9%	+13.5%	+5.2%	-9.8%	+5.8%
Ovine	+17.2%	+120.0%	+23.5%	+200.0%	-37.5%
Porcine	+55.5%	+16.6%	+200.0%	-81.0%	+133.3%
Pet birds	-98.4%	-68.2%	-89.4%	-48.8%	+8.8%
Pet mammals	-59.6%	+68.4%	+28.6%	-91.3%	+13.5%
Avian wildlife	N/A	N/A	N/A	N/A	N/A
Other	+345.2%	-12.1%	-6.0%	+943.7%	-48.4%
Total	+12.1%	+5.4%	+11.2%	-3.2%	+1.5%

Ambulatory and Field Services Caseload Trends 2001-2006					
Species	**% change over last five years**	**% change 05-06 vs 04-05**	**% change 04-05 vs 03-04**	**% change 03-04 vs 02-03**	**% change 02-03 vs 01-02**
Bovine	-11.3%	+8.3%	+17.2%	-14.3%	-18.3%
Caprine	+9.7%	+183.6%	-12.0%	-42.4%	-37.1%
Equine	+15.4%	-1.4%	+87.2%	-65.8%	+49.0%
Ovine	+477.0%	+9516.0%	-483.3%	-65.0%	+694.0%
Porcine*	N/A	N/A	N/A	N/A	N/A
Other*	N/A	N/A	N/A	N/A	N/A

*Due to a change in the documentation of swine and poultry field service visits, and number of "at risk" animals in 2005, direct comparisons between years are not possible. See Appendix 4-1 Table B for caseload numbers.

APPENDIX 5-1: BIOMEDICAL COMMUNICATIONS, WEBSITE AND INFORMATION TECHNOLOGY SUPPORT



APPENDIX 6-1: STUDENTS - TABLES A, B, C & D

Table A: Veterinary Medical Program

Veterinary Students	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Year 1	76	76	80	76	78
Year 2	76	77	78	75	77
Year 3	73	77	73	75	74
Year 4	75	73	76	73	75
Graduated	75	73	76	73	75

Table B: Interns, Residents, and Combined Residency-Graduate Programs

Academic Year	Interns	Residents	Residents-MS*	Residents-PhD*
2001-2002	8	12	20	5
2002-2003	8	21	11	5
2003-2004	8	30	5	6
2004-2005	8	32	5	7
2005-2006	9	37	4	7

*Combined residency-graduate students are also counted in Table C: Graduate Students.

Table C: Graduate Students

Academic Year	MS				PhD			
	Total	Minority	Minority %	Degrees Awarded	Total	Minority	Minority %	Degrees Awarded
2001-2002	36	11	31%	10	73	30	41%	15
2002-2003	24	5	21%	9	70	33	47%	14
2003-2004	14	3	21%	8	72	34	47%	11
2004-2005	15	4	27%	1	72	29	40%	5
2005-2006	16	6	38%	6	63	29	46%	15

Table D: Other Educational Programs

Number Enrolled, September of Academic Year	ECFVG Clinical Year	Foreign Seniors	Veterinary Technician Program	Undergraduate Programs	Other
2001-2002	0	14	0	0	0
2002-2003	0	12	0	0	0
2003-2004	0	11	0	0	0
2004-2005	0	18	0	0	0
2005-2006	0	15	0	0	0

APPENDIX 6-2: CVM STUDENT CLUBS AND ORGANIZATIONS

Veterinary Behavior Club
Christian Veterinary Fellowship
Invertebrate Animal Medicine Club
International Veterinary Students' Association (IVSA)
Pathheads (Pathology Club)
Radvets (Radiology Club)
Student Chapter of the American Association of Bovine Practitioners (SCAABP)
Student Chapter of the American Association of Swine Veterinarians (SCAASV)
Student Chapter of the American Association of Equine Practitioners (SCAAEP)
Student Chapter of the American Association of Feline Practitioners (SCAAFP)
Student Chapter of the American Association of Small Ruminant Practitioners (SCAASRP)
Student Chapter of the American Animal Hospital Association (SCAAHA)
Student Chapter of the American Association of Avian Pathologists (SCAAAP – Poultry Club)
Student Veterinary Emergency and Critical Care Society (SVECCS)
Veterinary Business Management Association (VMBA)
Holistic Veterinary Medicine Club
Theriogenology Club
Veterinary Educational Textbooks and Supplies (VETS)
Lab Animal
Pain Management
Wildlife, Avian, Aquatic and Zoo Medicine Club (WAAZM)
Student American Veterinary Medical Association (SAVMA)
Student Chapter of the American Veterinary Medical Association (SCAVMA)
Student Chapter of the International Veterinary Academy of Pain Management (SCIVAPM)

SCAVMA coordinates meetings of the various clubs so they do not overlap. Clubs meet 2-3 times per semester.

APPENDIX 6-3: ORIENTATION SCHEDULE FOR FIRST AND FOURTH YEAR STUDENTS

First Year Orientation Agenda, Class of 2010, August 7-12, 2006

Monday, August 7
Green Commons & South Theater

8:00	Continental Breakfast - sponsored by CVM & Purina
8:30	Welcome – Dr. Arden
8:45	Introductions – Dr. Bristol (faculty, staff and students) note: Dept. Heads call their faculty to the front of the room to introduce.
9:15	Break
9:30	Eleanor Stell (orientation agenda)
9:45	Dr. Bristol (safety memo, electing class officers, rabies form, cell phones, handbook)
10:15	Dr. Carl Williams (Environmental Health – Rabies)
10:45	Dr. Bengston (Student Health Services)
11:15	Dan McWhorter - PDA contract
11:30	SCAVMA – Jeff Broadaway, President; Bryna Riley – SAVMA Symposium
11:45	VETS - Nikki Hladio - Purina – AKC - Class officer presentations – Bo Bergman
12:15	Lunch PDA's – Dan McWhorter – Blue Commons All campus cards and security badges - BMC Composite pictures proceed to BMC Lockers - Phyllis
2:00-3:30	Dr. Mark Green – Veterinary Profession
3:30 – 5:30	Handling surgical instruments (South Theater) -- Dr. Lizette Hardie

Tuesday, August 8
South Theater

8:00 – 3:00	Personal Finance For Veterinary Students – Fritz Wood & Dr. Charles Wayner Lunch sponsored by Hills
3:15 – 4:00	Communication in Veterinary Medicine – Drs. Williams & Gerard
4:00 – 4:30	Sexual Harassment – Amy Circosta – Office of Equal Opportunity

Wednesday, August 9

8:00–12:30	Outdoor Learning Laboratory (Harrill Center - State Fair Grounds)
12:30 – 2:30	Lunch
2:30 – 3:00	Laura Osegueda – Library information (North Theater)
3:00 - 5:00.	White Coat fitting – FAS curriculum planning (North Theater & Lab)

*NOTE: For Food Animal Scholars Only. You will be fitted first. Immediately following your White Coat Fitting, you attendance is mandatory at your Curriculum Planning Session.

Thursday, August 10
South Theater

8:00 - 11:30	Understanding Self – MBTI; Eleanor Stell and Dr. Rhonda Sutton
11:30- 12:00	Emotional Intelligence – EQI; Eleanor Stell and Dr. Rhonda Sutton
12:00– 1:00	Lunch
1:00 – 2:00	Dr. Bernie Hansen – Advanced Medical Information Searches
2:00 – 2:45	Dr. Dennis Wages – Wellness Committee
2:45 – 3:00	Pam Gerace – Legal Affairs
3:00 – 3:15	Jon Barnwell – Public Safety

3:15 – 4:00	Dr. Hardie – Focus Areas
4:00 – 5:00	Dr. Sutton – Counseling, Student Services – Financial Aid, Mentors, Selectives

Friday, August 11

A.M - North Theater , P.M. - Career Presentations & Career Fair

8:00-9:00	Optional Sr. Clinical Conference
9:00-11:30	Computing@CVM & PDA's Dan McWhorter
11:30-11:45	Infectious Disease exam information
11:45 – 12:00	Dr. Arasu – International Travels
12:00-1:00	Lunch provided by NCVMA
1:00-1:30	Career Presentations
1:30-3:30	Career Fair begins
3:30	Tours given by DVM students

Orientation for New Seniors - May 2006
(Class of 2007)

Monday, May 8

8:00 – 8:15	Welcome – Dr. Bristol
8:15 – 9:15	Introduction to clinics by Dr. Davidson
9:15 – 9:30	Break and group A to computer lab, C-260 all other students to clinic for shadowing
9:30 – 12:00	Group A for UVIS training, C-260, computer lab all other students to clinic for shadowing
12:00 – 1:00	Lunch
1:00 – 3:30	Group B for UVIS training, C-260, computer lab all other students to clinic for shadowing

Tuesday, May 9

8:00 – 10:30	Group C for UVIS training, C-260, computer lab all other students to clinic for shadowing
12:00 – 1:00	Lunch
1:00 – 3:30	Group D for UVIS training, C-260, computer lab all other students to clinic for shadowing

Wednesday, May 10

8:00 – 10:30	Group E for UVIS training in C-260, computer lab all other students to clinic for shadowing
10:30 – 10:45	Break (all students from Group E and clinics to B-112)
10:45 – 11:15	Dr. DeFrancesco
11:15 – 11:30	Dr. Ian Robertson – Overview of RIS
11:30 – 11:45	Dr. Levine – Infectious Disease Commitee
11:45 – 12:15	PDA resources with Dan McWhorter
12:15 – 1:00	Lunch
1:00	Report to clinics for your first rotation selection

APPENDIX 7-1: ADMISSIONS - TABLE A

Year	Class	State Residents		Non-residents		Contract Students		Total	
		A/P	O/A	A/P	O/A	A/P	O/A	A/P	O/A
2001-2002	2006	169/62	64/62	251/14	28/14	N/A	N/A	420/76	90/76
2002-2003	2007	200/62	65/62	315/14	26/18	N/A	N/A	515/76	88/80
2003-2004	2008	173/62	69/62	341/14	19/14	N/A	N/A	514/76	81/76
2004-2005	2009	194/62	69/62	370/14	20/14	N/A	N/A	564/76	82/76
2005-2006	2010	220/62	65/62	380/14	25/14	N/A	N/A	600/76	87/76

A/P - Applications/Positions
O/A - Offers/Acceptances

APPENDIX 8-1: FACULTY - TABLES A, B, C & D

Table A - Loss and Recruitment of Faculty (2000-2005)

Dept.	Faculty Lost (#)	Discipline/Specialty	Recruited (#)	Year
DOCS		Community Practice	1	2000
DOCS		Dermatology	1	2000
DOCS		Laboratory Animal	1	2001
DOCS		Neurology	1	2001
DOCS		Equine	1	2001
DOCS		Equine Surgery	1	2002
DOCS		Oncology	1	2002
DOCS		Laboratory Animal	1	2002
DOCS		Neurology	1	2002
DOCS		Small Animal Internal Medicine	1	2002
DOCS		Small Animal Surgery	1	2002
DOCS		Ophthalmology	1	2003
DOCS		Equine Surgery	2	2004
DOCS	1	Oncology		2004
DOCS	2	Small Animal Internal Medicine	2	2004
DOCS		Animal Welfare	1	2005
DOCS		Behavior	1	2005
DOCS	1	Dermatology		2005
DOCS		Emergency/Critical Care	1	2005
DOCS		Oncology	2	2005
DOCS	1	Neurology		2005
DOCS		Infectious Disease	1	2005
MBS	1	Cell Biology	1	2002
MBS	1	Embryology		2002
MBS		Genomics	2	2002
MBS	1	Physiology		2002
MBS	2	Anesthesiology	1	2003
MBS	1	Radiology		2003
MBS		Anesthesiology	1	2004
MBS	1	Clinical Pathology		2004
MBS		Developmental Biology	1	2004
MBS	1	Immunology	1	2004
MBS		Infectious Disease/Immunology	1	2004
MBS		Radiology	1	2004
MBS	1	Anesthesiology	2	2005
MBS	1	Cell Biology		2005
MBS	1	Developmental Biology		2005
MBS		Infectious Disease	1	2005
PHP	1	Ruminant Health Management		2001
PHP	1	Epidemiology & Environmental Health		2002

PHP	1	Immunology		2002
PHP		Swine Health & Production	1	2002
PHP	1	Teaching Animal Unit/ Theriogenology		2002
PHP	1	Theriogenology		2002
PHP		Pharmacology & Risk Mgmt	1	2003
PHP	1	Ruminant Health Management	1	2003
PHP	1	Theriogenology	1	2003
PHP		Ruminant Health Management	1	2004
PHP		Theriogenology	1	2004
PHP	2	Poultry Health Management		2005
PHP	1	Ruminant Health Management		2005

Table B: Staff support for teaching and research

Area	FTE Clerical	FTE Technical	Other
Clinical Teaching	2	10 PHP see VTH data for MBS & DOCS	0
Non-Clinical Teaching	4	4	0
Research	11	61	0

Table C: Non-Veterinarians

Title	MS	PhD	Board Certified	Board Certified & MS	Board Certified & PhD
Administrator	2	1	0	0	0
Professor	0	11	0	0	0
Associate Professor	0	7	0	0	0
Assistant Professor	1	10	0	0	0

Table D: Veterinarians

Title	DVM (only)	MS	PhD	Board Certified	Board Certified & MS	Board Certified & PhD
Administrator	0	0	0	2	1	3
Professor	0	2	7	5	7	15
Associate Professor	0	2	6	4	7	14
Assistant Professor	6	1	0	9	6	12

APPENDIX 9-1: OVERVIEW OF THE CURRICULUM - See attached electronic document for an overview of the curriculum.

APPENDIX 9-2: AUDIT OF SELECTED CURRICULAR CONTENT

	Course # / Hours	**Course # / Hours**	**Course # / Hours**
CLINICAL REASONING AND PROBLEM SOLVING	VMP 912/12 hours	VMC 976/56 hours	VMC 971/40 hours
CRITICAL PATIENT CARE			
Intensive Care and Emergency Medicine	VMC 979/20 hours	VMC 960/96 hours	VMC 966/30 hours
Pain Management	VMB 930/6 hours	VMB 977 80 hours	VMC 979/5 hours
Principles and Hospital Practice for Isolation of Infectious Diseases	VMP 914 / 8 hours	VMP 924/3 hours	VMC 979/5 hours
INFORMATION MANAGEMENT AND THE MEDICAL RECORD			
Herd Health	VMP 916/23 hours	VMP 936/18 hours	VMP 970/40 hours
Individual Animals	VMC 979/40 hours	VMC 971/20-30 hours	VMP 970/20 hours
HUMAN ANIMAL BOND			
Behavior	VMC 927/26 hours	VMC 971/2 hours	VMC 979/6 hours
Animal Welfare	VMC 962/8 hours (ethics of welfare issues)	VMC 970/ 3 hours	VMP 970/40 hours
Euthanasia and Grief Counseling	VMC 962/1hour	VMC 980/ 8 hours	VMC 971/2 hours
EPIDEMIOLOGY AND ZOONOSES			
Regulatory Principles	VMP 945/ 7 hours	VMP 970/8 hours	VMP 958/2 hours
Epidemiology	VMP 945/16 hours	VMP 970/20 hours	VMC 970/5 hours
Animals and the Environment	VMP 945/3 hours	VMP 958/2 hours	VMP 970/10 hours
Zoonoses	VMP 945/7 hours	VMP 924/5 hours	VMP 970/2 hours
Food Safety	VMP 945/4 hours	VMP 958/6 hours	VMP 970/16 hours
Foreign Animal Disease	VMP 945/2 hours	VMP 958/15 hours	VMP 924/10 hours
MOLECULAR AND CELL BIOLOGY	VMB 922/4 hours	VMP 924/3 hours	
PROFESSIONAL DEVELOPMENT			
Career Knowledge/Options	VMC 910/12 hours	VMC 992V/ 8 hours	
Attributes and Worth of a Professional	VMC 992V/8 hours	VMC 962/3 hours	VMC 910/12 hours
Ethics	VMC 962/12 hours (includes welfare issues)	VMC 992V/16 hours	VMC 970/ 3 hours
Communication	VMC 962/8 hours	VMC 991I/30 hours	VMC 992V/4 hours
Business and Practice Management	VMC 962/2 hours	VMC 992V/40 hours	VMP 991A
CLINICAL TECHNIQUES AND SKILLS			
History and Physical Exam	VMP 956/42 hours	VMC 937/30 hours	VMC 971/30-40 hours
Hands-on Clinical Procedures (catheter placement, nasogastric intubation)	VMP 956/42 hours	VMC 960/48 hours	VMC 970/45 hours

APPENDIX 10-1: RESEARCH ACTIVITIES OF THE COLLEGE OF VETERINARY MEDICINE

Faculty Members Involved in Research - By Department
DOCS - Department of Clinical Sciences MBS - Molecular Biomedical Sciences PHP - Population Health and Pathobiology

	Department	Total # Faculty	# Involved in Research	# Teach in DVM curriculum	Total Dept Salary*	Total Salary Savings	% Salary recovered	Extramurally Sponsored Research Grants		# Peer-reviewed Research Publications
								Number	Value ($)	
2003	DOCS	52	37	49	4,291,500	174,986	4.08	64	2,266,231	88
	MBS	31	29	26	3,395,716	397,236	11.7	34	5,056,951	50
	PHP	47	39	47	4,090,221	316,952	7.76	35	2,795,568	105
	Totals	**130**	**105**	**122**	**11,777,437**	**889,174**		**133**	**10,118,750**	**243**
2004	DOCS	51	40	49	4,272,218	149,377	3.5	54	2,732,410	80
	MBS	37	31	29	3,391,652	523,615	15.44	42	7,458,846	60
	PHP	49	40	49	4,317,368	309,612	7.17	33	4,656,255	120
	Totals	**137**	**111**	**127**	**11,981,238**	**982,604**		**129**	**14,847,511**	**260**
2005	DOCS	55	40	53	4,579,170	150,982	3.3	51	3,496,367	110
	MBS	39	32	32	3,419,383	585,631	17.13	27	4,349,953	59
	PHP	48	40	48	4,435,524	389,726	8.79	33	2,141,186	133
	Totals	**142**	**112**	**133**	**12,434,077**	**1,126,339**		**111**	**9,987,506**	**302**

*Includes fringe benefits.

APPENDIX 10-2: OTHER MEASURES OF FACULTY RESEARCH ACTIVITY

Faculty Involvement - By Department
DOCS - Department of Clinical Sciences MBS - Molecular Biomedical Sciences PHP - Population Health and Pathobiology

	Department	Papers presented at meetings	Faculty on Research Panels			Faculty holding officer positions in scientific organizations			Faculty on Editorial Boards	Invited Research Presentations
			NC	National	International	NC	National	International		
2003	DOCS	79	0	5	3	1	2	1	7	259
	MBS	61	0	9	4	1	3	2	11	74
	PHP	91	3	15	1	7	3	2	10	91
	Totals	**231**	**3**	**29**	**8**	**9**	**8**	**5**	**28**	**424**
2004	DOCS	86	0	4	1	0	3	6	8	316
	MBS	66	0	9	3	1	2	3	9	69
	PHP	112	2	15	2	6	4	1	9	112
	Totals	**264**	**2**	**28**	**6**	**7**	**9**	**10**	**26**	**497**
2005	DOCS	100	0	1	1	0	6	6	11	320
	MBS	52	1	11	3	1	5	3	10	101
	PHP	103	2	15	1	6	3	2	12	103
	Totals	**255**	**3**	**27**	**5**	**7**	**14**	**11**	**33**	**524**

See Appendix 11-6 for faculty research awards.

APPENDIX 11-1: 1999 ALUMNI SURVEY RESULTS

Highlights of the 1999 Alumni Survey (514 responses) (52.8% response rate)

Practice Type: Employment of male and female graduates in their first year after graduation and current employment

	Men		Women	
Type of Employment	**First year**	**Current**	**First year**	**Current**
Post graduate veterinary education	12.50%	2.80%	14.20%	5.64%
Post graduate non-veterinary education	0.69%	0.00%	1.58%	0.00%
Small Animal Practice	38.19%	41.96%	54.57%	58.93%
Mixed Animal Practice	26.39%	12.59%	19.24%	6.27%
Large Animal Practice	6.25%	4.20%	0.95%	0.63%
Equine Practice	3.47%	4.20%	1.89%	1.88%
Emergency Medicine	2.78%	1.40%	1.58%	1.25%
Government or Military	3.47%	9.09%	1.26%	2.51%
Academic Veterinary Medicine	0.00%	6.29%	0.00%	2.82%
Industry	1.39%	5.59%	0.63%	0.94%
Other	2.78%	4.90%	1.58%	8.46%
Relief work	0.00%	2.10%	1.58%	3.76%
Employed outside veterinary medicine	2.08%	4.90%	0.63%	3.76%
Unemployed	0.00%	0.00%	0.32%	3.13%

Success at obtaining post-veterinary training: Internships were sought by 17.7% of graduates, and of these, 78% were successful. Residencies were sought by 15.3% of graduates, and of these 87.3% were successful. Graduate training (Masters or Doctor of Philosophy programs) was sought out by 15.4% of alumni, and of those 84.1% were successful.

Species treated by alumni in clinical practice

		0%	**1-15%**	**16-30%**	**31-45%**	**46-50%**	**51-65%**	**66-80%**	**81-100%**
Small Animal	Men	42.8%	1.4%	1.4%	1.4%	2.1%	3.4%	5.5%	42.1%
	Women	29.1%	0.3%	0.3%	0.0%	1.2%	2.8%	4.0%	62.2%
Horses	Men	77.2%	7.6%	2.8%	4.1%	1.4%	0.0%	2.1%	4.8%
	Women	87.0%	7.7%	2.2%	0.0%	0.3%	0.0%	0.3%	2.5%
Cattle	Men	80.7%	11.0%	3.4%	2.1%	1.4%	0.0%	0.0%	1.4%
	Women	90.7%	6.8%	0.9%	0.0%	0.0%	0.6%	0.6%	0.3%
Swine	Men	91.0%	8.3%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%
	Women	96.0%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Poultry	Men	96.6%	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Women	98.5%	1.2%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%
Exotics	Men	69.0%	29.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.7%
	Women	56.0%	40.6%	1.2%	0.6%	0.0%	0.3%	0.0%	1.2%

Comments on education

- Top five most useful prerequisite courses: General Biology, Microbiology, English composition, Biochemistry, Animal Nutrition. Business courses were most often listed as the prerequisite that should be added.
- Courses that got too little emphasis in veterinary education: Introduction to PE skills, Principles of Surgery, Professional Development, Clinical Nutrition, Introduction to Clinical Practice
- Courses that got too much emphasis in veterinary education: Toxicology/Poisonous Plants, Parasitology, Embryology, Swine/Poultry Medicine, Public Health/Hygiene
- Top things that should have been covered, but weren't: Business management, Finance, Communication, Practical everyday applications, Clinical skills
- Top five things that they would change about their education: allow tracking, more clinical time/hands-on experience, more surgery, more everyday applications, more externships

APPENDIX 11-2: 2005 ALUMNI SURVEY RESULTS

Highlights of the 2005 Alumni Survey (60 responses, 42.3% response rate)

Practice Type: Employment of male and female graduates in their first year after graduation and current employment

	Class of 2000		Class of 2004	
Type of Employment	**First year**	**Current**	**First year**	**Current**
Clinical Practice	84%	62.5%	57.1%	50.0%
Academic Veterinary Medicine	4.0%	8.3%	21.4%	23.3%
Emergency Medicine	4.0%	4.2%	13.3%	13.3%
Relief Work	8.0%	8.3%	0	0
Government or Military Vet Med	0	4.2%	3.6%	3.3%
Corporate, nonclinical	3.6%	0	3.6%	3.3%
Other Setting in Vet Medicine	0	12.5%*	0	6.7%*

*Includes teaching vet tech program, PhD program, shelter medicine, rehab clinic

Average percent of clinical work devoted to specific species.

	Class of 2000	Class of 2004
Small Animal	80.1	76.0
Horses	11.0	6.0
Cattle	1.0	0.1
Small Ruminants	0.1	0.1
Camelids	3.5	0
Swine	0	0
Poultry	0	4.8
Exotics	7.8	7.8

Post-DVM Training	Class of 2000		Class of 2004	
	Sought	Success	Sought	Success
Internship	18.5%	100%	28%	100%
Residency	15.4%	74.6%	24.1%	100%
Graduate Training	0	0	11%	67.2%

Comments on Education

Knowledge and skills that served respondent best in first year after graduation (% of respondents)

	Class of 2000	Class of 2004
Communication	68.2	33.3
General Medical/Surgical Knowledge	40.9	33.3
Surgery Skills	18.2	33.3
Special areas/Species	27.3	16.7
Diagnostic Skills	0	16.7
Interpret Lab Results	0	16.7
Patience/Discipline Personal Qualities	13.6	0

Most important knowledge and skills learned in veterinary education (% of respondents)

	Class of 2000	Class of 2004
PE Skills	50	33.3
Surgery Skills	41.7	36.7
Communication Skills	25.0	43.3
General Medical Knowledge	20.8	13.3
Radiology	20.8	6.7
Problem solving	16.7	13.3
Clinical pathology	8.3	16.7

Area in which most poorly prepared (# of mentions)

	Class of 2000	Class of 2004
Surgery Skills	13	5
Business - Personnel Skills	7	5
Emergency	4	0
Dentistry	3	0
Routine Care	2	3
Endocrinology	2	0

Courses most helpful in work during the past year (% who selected course as 1 of 3 most helpful)

	Class of 2000	Class of 2004
Companion Animal Medicine 1/2	39.3	70
Clinical Pathology	28.6	39.3
Systemic Pathology	39.3	23.3
Radiology	42.9	23.3
Principles of Surgery	25	20

Courses that should be eliminated (# of mentions)

	Class of 2000	Class of 2004
Need tracking	7	0
Combine basic science courses	1	5

Courses that need to be added (# of mentions)

	Class of 2000	Class of 2004
Business	4	2
Surgery	3	0
Emergency	2	0

Should every veterinary student be required to work with all common species treated in practice? (% of respondents)

	Class of 2000	Class of 2004
YES	37.5	34.5
NO	62.5	65.5

Value of selectives in respondent's veterinary education (% of respondents)

	Class of 2000	Class of 2004
Extremely Valuable	72.7	69.0
Valuable	22.7	24.1
Neither/Not very valuable	4.6	6.9

Rating of quality of selected aspects of CVM (Excellent/Good/Average/Fair/Poor) (% of respondents)

	Class of 2000		Class of 2004	
Aspect	**Poor/Fair**	**Good/ Excellent**	**Poor/Fair**	**Good/ Excellent**
Course Content	0	96.2	0	82.7
Quality of Instructors	0	100	3.5	82.8
Instructors' Attitudes towards Students	11.6	69.2	3.5	79.3
Classroom Facilities	0	65.4	0	58.6
Laboratory Facilities	0	65.4	10.7	60.7
Library	8.3	70.8	6.7	75.8
Teaching Animal Unit	3.9	97.3	3.5	96.5
Hospital Facilities	3.9	73.1	3.5	82.8
Computer Facilities	3.9	42.3	27.5	41.4
Career Planning	30.8	26.9	37.9	13.8

Topics that should have been covered in respondent's veterinary education (% of respondents)

	Class of 2000	Class of 2004
Business/practice management/finance	42.9	34.4
Legal issues/documentation/regulations	25	6.3
Communications/Interactions with others	14.3	25.0
Surgery (more advanced)	17.9	6.3
Emergency/Critical Care Procedures	10.7	12.5
Specialty areas/Species	3.6	15.6
Hands on skills	0	18.8

Things respondent would change about his/her veterinary education (# of mentions)

	Class of 2000	Class of 2004
Allow tracking	11	7
Business Course	3	3
More Primary Care	4	6
More Surgery	5	2
More Hands-On Experience	4	1
Earlier Intro to Clinics	2	9
More Emergency	2	2

APPENDIX 11-3: SENIOR STUDENT EXIT SURVEY RESULTS

	2000	2001	2002	2003	2004	2005	2006	AVG
Response rate	91.8	97	58.7	63	74	54	42.6	**68.73**
Overall Evaluation:								
%3 or > (mean rating)	95.4(4.3)	93.7(4.4)	100(4.0)	98(4.2)	89(3.7)	100(4.2)	93(3.9)	**95.5(4.1)**
Quality of:	%3 or >	%3 or >	%3 or >	%3 or >	%3 or >	%3 or >	%3 or >	%3 or >
Year 1	80(3.2)	69(3.1)	86(3.5)	85(3.4)	66(2.9)	68(2.9)	65(2.2)	**74.1(3)**
Year 2	92(3.6)	91(3.7)	95(3.7)	96(3.8)	79(3.3)	95(3.8)	78(2.8)	**89.4(3.5)**
Year 3	82(3.4)	85(3.4)	95(3.7)	96(3.7)	91(3.7)	98(3.9)	78(3.0)	**89.2(3.5)**
Year 4	86(3.5)	96(4.1)	95(3.9)	93(4.1)	89(3.9)	98(4.3)	87(3.9)	**92(3.9)**
Selectives	97(4.2)	99(4.4)	93(4.1)	87(3.8)	82(3.5)	85(3.8)	65(2.6)	**86.8(3.7)**
TAU	88(3.6)	96(4.1)	89(3.9)	93(3.6)	95(4.3)	95(4.1)	87(3.4)	**91.8(3.8)**
Instruction	93(3.6)	94(3.9)	98(3.9)	100(4.0)	94(3.7)	100(4.2)	87(3.4)	**95.1(3.8)**
Facilities	81(3.4)	92(3.4)	88(3.3)	81(3.3)	81(3.4)	90(3.7)	68(2.6)	**83(3.3)**
THIS or UVIS	12(1.5)	26(2.0)	14(1.7)	21(2.0)	21(1.8)	32(2.1)	31(1.0)	**22.4(1.7)**
First Year Orientation	ND	ND	ND	60(2.7)	46(2.6)	68(2.8)	15(0.6)	**27(1.2)**
Interactions with:								
Faculty	94(3.6)	93(3.8)	98(4.0)	96(4.0)	91(3.8)	98(3.9)	71(2.8)	**91(3.7)**
Staff	92(3.8)	94(3.7)	98(4.0)	98(3.9)	89(3.7)	87(3.5)	71(2.8)	**89.8(3.6)**
Residents	88(3.6)	92(3.6)	95(3.9)	100(4.1)	94(4.1)	90(3.8)	87(3.5)	**92.2(3.8)**
Interns	88(3.5)	91(3.7)	91(3.9)	98(4.1)	95(4.2)	87(3.7)	87(3.4)	**91(3.7)**
Classmates	98(3.8)	96(4.2)	100(4.4)	98(4.1)	93(4.0)	95(4.3)	90(3.6)	**95(4.0)**
Other Students	89(3.5)	88(3.7)	98(3.8)	93(3.9)	96(3.9)	95(4.0)	81(3.1)	**91(3.7)**

Scale 1-5 (5=excellent, 4=very good, 3=good, 2=fair, 1=poor)

Comments from Senior Student Exit Surveys:

2003 **Best Experiences:** 4th year clinics (22 mentions), surgery/hands on experiences (7), selectives (5), externships (3)
Worst Experiences: Poor teacher/staff/student relations (10 mentions), Public Health/Epidemiology (6), Large Animal Weekend Treatment Crew (5), Amount of memorization (3)

2004 **Best experiences:** 4th year clinics (21 mentions), Mobile Surgery Unit/Community Classroom (10), TAU (7), externships (4), good faculty interactions (3)
Worst Experiences: Poor teacher/staff-student relations (9 mentions), 2nd year (3), Large Animal Treatment Crew (2), Radiology rotation (2), Soft tissue surgery rotation (2), UVIS (2)

2005 **Best Experiences:** 4th year clinics (20 mentions), mobile unit (9), classmates and friends (3), selectives (2), TAU (2), cardiology rotation (2), neurology rotation (2), travel opportunities (2)
Worst Experiences: Overnight call/ICU (8 mentions), Teacher/staff conflict (7), 2nd year schedule/stress (5), pathology class (3), UVIS (2), paperwork (2)

2006 **Best Experiences**: 4th year clinics (19 mentions), TAU (5), selectives (5), mobile unit (3), externships (2)
Worst Experiences: Radiology rotation (6 mentions), 2nd year schedule/stress (4), teacher/staff conflict (3), nutrition class (3), public health (2), paperwork (2), clinical pathology rotation (2), overnight call (2), UVIS (2)

APPENDIX 11-4: 2006 FACULTY AND HOUSE OFFICER SURVEY RESULTS

Highlights of the 2006 Faculty and House Officer Survey (82 Respondents, 44% response rate, 74.1%Faculty, 24.6% House Officers, 48.8% have taught here > 10 years, 43.9% have taught here < 5 years)

Faculty that teach in a particular year of the curriculum were asked to rate the overall preparedness of students entering their class:

Year	Overall Preparedness			Specific areas in which students are not well prepared?		
	Not adequate	Adequate	Very well	Yes	No	Areas of concern
1	13%	74%	13%	40%	60%	study skills, language basis for medical terminology, basic biology, and animal science knowledge
2	7%	82%	11%	32%	68%	basic knowledge and animal science knowledge
3	11%	78%	11%	44%	56%	basic pathology and pathophysiology, medical vocabulary, and animal science knowledge
4	11%	78%	11%	59%	41%	problem identification, problem solving, knowledge and use of physiology and pathophysiology

When asked to rate overall facilities and equipment, 95% of the faculty rated them as adequate or excellent. Faculty were also asked to rate the quality of specific facilities equipment and that they use:

	Not adequate	Adequate	Excellent
Lecture spaces	12%	58%	30%
Seminar rooms	10%	77%	13%
Teaching laboratory spaces	14%	65%	21%
Clinical rounds rooms	27%	57%	16%
Equipment available for teaching	6%	66%	28%
Best aspects of facilities and equipment: Audiovisual upgrades in many teaching rooms, the two amphitheaters, the Teaching Animal Unit, the radiology facilities, and the layout of the live animal teaching laboratory.			
Areas of concern: Limited space for live animal laboratories, the D-239 lecture room, temperature control in the building and teaching spaces, projection quality in the theaters (especially radiographic image quality), the number of small seminar rooms available, the availability of microscopes, and the size of some clinical rounds rooms.			
Improvement priorities: Number one comment - more space. Other comments mentioned most often were increase the number of seminar rooms (teaching rooms for small groups), replace D-239 with a theater, standardize computer and audiovisual equipment between rooms, improve wireless access, improve temperature control and replace the ceiling missing due to work on HVAC system.			

When asked to rate the overall library and information resources, 97% of the faculty rated them as adequate or excellent. Faculty were also asked to rate the quality of specific components of library and information resources:

	Not adequate	Adequate	Excellent
Access to online journals and other information sources	13%	40%	47%
Access to print journals, books and other information sources	5%	55%	40%
Informational technology support for teaching efforts	1%	65%	34%
Best aspects of library and information resources: Tripsaver (an online resource to get journal articles from Triangle universities) and the online access to journals.			
Areas of concern: Decreased access to online journals due to recent budget cuts.			
Improvement priorities: Increased access to online journals, a more functional university literature search/retrieval website, and better computer space.			

Faculty were asked to rate the adequacy of the clinical resources that they used:

	Not adequate	Adequate	Excellent
VTH caseload for teaching veterinary students	19%	49%	32%
VTH caseload for teaching interns and residents	12%	34%	54%
Large Animal Hospital as a teaching resource	16%	68%	16%
Small Animal Hospital as a teaching resource	10%	50%	40%
Teaching Animal Unit as a teaching resource	0%	15%	85%
Wake County Shelter Program as a teaching resource	0%	67%	33%
Field services as teaching resources	10%	45%	45%
Best aspects of clinical resources: Quality of the faculty, the Teaching Animal Unit, the imaging capabilities, and the high teaching hospital caseload.			
Areas of concern: Small necropsy caseload, too few primary care cases and a low food animal caseload.			
Improvement priorities: Increased space, the organization of the small animal ward space, combining the state and CVM diagnostic laboratories, increased number of primary care cases, and increased hospital technical help to allow more teaching time with a busy caseload.			

When asked if he/she had any other areas of concern 50% answered yes.
The concerns most commonly expressed were the conflict between a high caseload and teaching in the hospital, the low number of primary care cases, grade inflation, the lack of diversity of students and student backgrounds, and the ability of the students to solve problems, rather than simply memorizing facts.

APPENDIX 11-5: OTHER ASSESSMENT OUTCOMES

	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Original works in peer-reviewed journals	210	166	189	177	225	237	262
Case reports in peer-reviewed journals	30	24	31	30	21	29	19
Review articles in peer-reviewed journals	20	31	27	19	22	22	30
Books	5	2	3	3	9	2	5
Book Chapters	78	63	41	35	97	68	38
Abstracts	284	233	228	297	230	210	298
Invited research presentations	288	591	590	646	424	435	421
Electronic media	31	52	30	41	28	31	28
CE presentations	59	112	99	80	68	55	44
Bulletins, booklets	19	14	24	23	14	15	12
Copyrights	5	3	4	8	1	1	1
Patents	10	10	17	9	2	2	1

APPENDIX 11-6: UNIVERSITY AND EXTRAMURAL FACULTY AWARDS (BY DEPARTMENT

DOCS - Department of Clinical Sciences MBS - Molecular Biomedical Sciences PHP - Population Health and Pathobiology

	Dept.	Faculty	Award
2001	DOCS	Ferris	NCSU Alumni Extension Award, accepted into the North Carolina State Academy of Outstanding Faculty Engaged in Extension
	DOCS	Ford	Distinguished Faculty of The Southern Medical Association
	MBS	Arasu	American Association for Advancement of Science Congressional Science Fellowship
	PHP	Barnes	Environmental Mutagen Society Special Recognition Award
	PHP	Guy	Distinguished Alumnus, University of Tennessee College of Veterinary Medicine
2002	DOCS	Davidson	Inducted into NCSU Academy of Outstanding Teachers
	DOCS	DeYoung	NC Veterinary Medical Association Distinguished Veterinarian Award
	DOCS	Ford	Honorary Diplomate Status in the American College of Veterinary Preventative Medicine
	DOCS	Hansen	American College of Veterinary Emergency and Critical Care Scientific Achievement Award for Pain Management of the Critically Ill
	DOCS	Lewbart	University Board of Governors' Award for Excellence in Teaching
	DOCS	Mansmann	Inducted into the International Equine Veterinarian's Hall of Fame
	DOCS	Stoskopf	Inducted into the George H. Glover Gallery of Contemporary Faculty at Colorado State University
	MBS	Brownie	Inducted into Sigma Iota Rho National Honor Society for International Studies
	PHP	Anderson	Outstanding Extension Service Award, NCSU Academy of Outstanding Faculty Engaged in Extension
	PHP	Floyd	Richard Deese Award for Advancing the Performance Principles of the Alabama Beef Cattle Improvement Association
	PHP	Guy	Pfizer Animal Health Award for Research
	PHP	Riviere	Burroughs Wellcome Fund Distingushed Professor
	PHP	Vahlenkamp	Sixth International Feline Retrovirus Research Symposium, best oral presentation
2003	DOCS	Ferris	State Animal Response Team Founder Award
	DOCS	Harms	2003 Outstanding Extension Service Award NCSU
	DOCS	Harms	American College of Zoological Medicine, President's Award for Service
	DOCS	Olivry	*Sigma Xi* Faculty Research Award, NC State University Chapter of *Sigma Xi*, The Scientific Research Society
	DOCS	Stoskopf	Emil Dolensek Award for lifetime achievement in Wildlife Conservation and Health from the Wildlife Conservation Society
	MBS	Smallwood	North Carolina Veterinary Medical Association Distinguished Veterinarian Award
	MBS	Smoak	F. Clark Fraser Investigator Award - Teratology Society
	PHP	Anderson	Outstanding Extension Service Award - The Academy of Outstanding Faculty Engaged in Extension

	PHP	Anderson	Alumni Outstanding Extension and Outreach Award
	PHP	Kennedy-Stopskopf	ACZM President's Service Award
	PHP	Vaillancourt	Lamplighter Award - The US Poultry and Egg Association
2004	DOCS	Birkenheuer	2004 Pollack Thesis and Dissertation Award
	DOCS	Breitschwerdt	2004 Distinguished Alumnus Award from the University of Georgia
	DOCS	Hawkins	Recognized as Distinguished Alumnus at Animal Medical Center, NYC
	DOCS	Monteiro	Certificate of Recognition for Outstanding Service and Dedication from Sigma Xi Scientific Research Society
	DOCS	Olivry	American College of Veterinary Dermatology Award for Excellence for Outstanding Contributions to Science and Teaching
	MBS	Adler	Holladay Medal, NCSU
	MBS	Adler	NIH 10 year MERIT Research Award
	PHP	Altier	Pfizer Animal Health Award for Research Excellence
	PHP	Riviere	Inducted into the Institute of Medicine of the National Academies
	PHP	Roberts	Outstanding Extension Service Award - NCSU Academy of Outstanding Faculty Engaged in Extension
2005	DOCS	Breitschwerdt	World Small Animal Veterinary Association Waltham International Award for Scientific Achievement
	DOCS	Breitschwerdt	American College of Veterinary Internal Medicine RW Kirk Award for Professional Excellence
	DOCS	Ford	Speaker of the Year, 2005 North American Veterinary Conference
	DOCS	Ford	2005 Distinguished Alumni Award, College of Veterinary Medicine, The Ohio State University
	DOCS	Keene	AMC Distinguished Alumni Award, 2005
	DOCS	Noga	Leading Scientists of the World, 2005
	MBS	Adler	UNC Board of Governor's O. Max Gardner Award
	MBS	Adler	NIH NHLBI MERIT Award (5 R37 HL-36982): 2004-2014
	PHP	Barnes	Phibro Animal Health Excellence in Poultry Award - American Association of Avian Pathologists
	PHP	Barnes	Outstanding Extension Service Award - NCSU Academy of Outstanding Faculty Engaged in Extension
	PHP	Barnes	Member - NCSU Academy of Outstanding Faculty Engaged in Extension
	PHP	Riviere	Elanco Distinguished Lecturer Award

APPENDIX 11-7: CVM COMPACT PLAN

College of Veterinary Medicine Compact Plan Initiatives, 2005-2007

Initiatives for 2006-2007

1. Functional Genomics – Center for Comparative Molecular Medicine

Center for Comparative Medicine and Translational Research: This initiative successfully established this new Center at the CVM, which emphasizes research into the molecular mechanisms of animal (and human) disease. The research foci of the Center are Molecular Medicine and Comparative Genomics, with subspecialties (i.e., research strengths) of research being identified. This Center encompasses faculty from the CVM, as well as other colleges at NCSU (i.e., CALS, PAMS, Engineering). It is envisioned that this Center will foster research collaborations between basic and clinical scientists, and will foster the development of research programs that will be competitive for Program Project grants from the NIH.

In order to insure the success of this initiative, it is recognized that the Center will require strong leadership. We appointed Dr. Jorge Piedrahita as Interim Director and are currently recruiting for an internationally recognized biomedical scientist to serve as permanent Director of the Center. This individual will need to have an established, active, and extramurally funded research program (preferably by multiple NIH grants). The new Director will need to be capable of facilitating interactions between diverse research groups, and will need to facilitate the submission of program and core grants to support the Center. This Center will also require additional faculty with research excellence in molecular biomedical science. For this, two junior faculty will be recruited to join the Center, with the faculty holding primary academic appointments in one of the three CVM departments. It is envisioned that the junior faculty would have research programs that would bridge current research strengths in the College, in order to foster interactions between research groups and the development of program project grant applications.

This new Center will foster the development of research programs that take advantage of the expertise of both basic and clinical scientists in the CVM. An additional desired outcome is the successful competition for NIH Program Project grants to support the new research programs generated by Center faculty.

The development of this Center, the continued growth of research in general, plus the development of the Centennial Biomedical Campus, all falls under the guidance of the Associate Dean for Research and Graduate Studies. With the importance of these areas, the CVM would like to separate responsibilities, creating a position specifically as the CVM Director of Biomedical Program Development. This would provide focused support for the development of the Biomedical Campus, including interactions with Centennial Campus officials, Financial Services, Planning and Analysis and other pertinent groups. This new position would be supported, in part, by the Director of Government and Corporate Relations, thus facilitating the development of academic, corporate and governmental partnerships to further enhance on-campus biomedical programs.

Resources: Recruiting the top candidates the Center Director and new faculty positions will require competitive startup packages (funded by CVM and Vice Chancellor for Research). The CVM is also asking for permanent salary funding to create a position as Director of Biomedical Program Development.

2. Biodefense of Animal & Human Health, Food Safety, and Profitable Production of Healthy Food Animals

Background: Biopreparedness is the suite of tools and practices limiting populations' exposure to harmful agents, and in an outbreak, detecting the agent(s) and treating the exposed. 75% of CDC's "agents of concern" are zoonotic (infecting humans and animals); SARS and the H5N1 Avian Influenza are but two examples. Agents in the USA, such as Johne's Disease, are recognized as potential zoonotic diseases needing increased efforts to eradicate them. Non-zoonotic agents, such as Foot and Mouth Disease, inflict severe socioeconomic harm on their own. In 2004, agriculture accounted for 17% of NC's GDP, 20% of its employment, and generated over $59 B; at least three times more than the next biggest industry, tourism. Animal agriculture comprises most of NC's agricultural income. Because of its importance to our economic and social stability, accidental or purposeful exposure to a catastrophic foreign animal disease could devastate our entire economy and threaten the human food supply.

The Issue: Veterinarians are key players in enhancing security of animal agriculture, however, fewer graduates choose private/public practice in food animal health/public health: the 2005 National Academies' study, "Animal Health at the Crossroads", concluded "...The workforce on the front lines of animal care is not adequately educated and trained to deal with animal disease issues, and there is a shortage of veterinarians...".

The Food Animal Security, Sustainability, & Biopreparedness Initiative: The CVM will develop a tripartite program of excellence in agricultural animal health, food safety & security, and biopreparedness: [1] training in medicine, diagnostics, emergency response, research and epidemiology; [2] exposure to/development of state-of-the-art diagnostic assays; and [3] enhanced surge capacity to rapidly respond to state/industry needs. Food supply veterinarians finishing the program will be prepared to meet the new needs and mandates of private and public practice.

The goal is to become a full NCSU Center within five years of inception. The CVM will leverage existing strengths in animal health, detection/diagnostics, and biosecurity: the Food Animal Residue Avoidance Databank, the Center for Comparative Medicine and Translational Research, and partnerships with the NC Departments of Agriculture, Health, and Crime Control. The CVM is a member in the Agricultural Disaster Research Institute and the Southeast Regional Center of Excellence in Emerging Infections and Biodefense, offering opportunities to collaborate on shared missions. In addition, our research building facilitates collaborations by providing access to two BSL-3 AG laboratories.

Outcomes: The greatest outcomes will be outbreaks that do NOT occur. Other outcomes include:

- Facilitating public/private partnerships in the areas of public health/food safety, and enhancing student education towards careers in private/public food supply veterinary service.
- Training the next generation of food animal veterinarians who can respond to evolving opportunities for securing animal industries, protecting food safety/security, and promoting biopreparedness.
- Providing CVM faculty/staff/students state-of-the-art pathogen detection, surveillance, and diagnostic assays for agricultural animal health and food safety.
- Developing surge capacity to respond quickly to industry and state needs in agricultural animal health, food safety/security, and biopreparedness.
- Establish a new Center of Food Animal Security, Sustainability, & Biopreparedness

Resources: The Department of Population Health and Pathobiology will soon have up to five open faculty positions. It is planned to do a focused recruitment and hire of all five in support of Livestock Infectious Diseases and Biosecurity as core hires for the proposed Center. The CVM is requesting salary support to bring all five positions up to highly competitive levels. The CVM is also requesting funding for a Program/Center Director. Funding will be used for an interim Director until a national search can be done for a permanent leader of this program. The CVM would also like to expand the duties of the Director of Corporate and Government Relations in support of the development of this Center, and is requesting salary support.

3. Companion Animal Health Program

While already recognized as one of the leading companion animal health programs nationally, the College is preparing to move the program to the forefront by development of new state-of-the-art facilities, recruitment of additional clinical faculty and introduction of additional areas of academic clinical expertise. Central to this endeavor will be the design and construction of the new Randall B. Terry Companion Animal Veterinary Medical Center. Named after long-term friend and benefactor of the College, the late Randall Terry, the center will provide 120,000 sq ft of technologically advanced clinical space designed for optimum delivery of specialty patient care, student instruction and clinical investigation. Complementing the specialty care services of the Terry Center will be the renovation and redevelopment of the current 60,000 sq ft small animal hospital into a new Companion Animal Outpatient and Wellness Center. The two adjacent centers will provide complementary public engagement and instruction platforms that expand current programs in orthopedics, general surgery, internal medicine, cardiology, ophthalmology, oncology, neurology, dermatology, anesthesia, radiology, pain management, clinical pathology and pharmacology, and introduce new areas of focus such as behavioral medicine, nutrition, rehabilitation, dentistry, companion animal reproduction and outpatient radiology and surgery.

Programmatic planning for the RBT Medical Center is complete, and we are in the midst of schematic design for the new building. It is anticipated that construction documents will be initiated by Fall 2006.

Resources: To accomplish these goals, a vigorous capital campaign is underway as part of the NC State's overall capital campaign. Funding for the construction and remodeling projects outlined above will come from a combination of sources, including state bond funds, gift funds and teaching hospital generated income. Recurring funds for additional clinical faculty, house-officers and staff to conduct these programs are projected to come from a combination of state-appropriate and tuition revenues and teaching hospital generated revenues.

4. Equine Health Program

The equine industry of North Carolina is a robust and rapidly growing industry focused on the performance horse (event, hunt, dressage, western), with a smaller but healthy breeding and race training industry. Over the past several years we have focused on gaining depth and quality among our faculty and are nearing critical mass in the focus areas of gastroenterology, orthopedics and sports medicine, ophthalmology, reproduction and epidemiology. Long term (5-10 years) success of this program will also be dependent upon construction of new faculties to house a premiere equine health program. In the short term, however, much must be accomplished to consolidate the reputation of the program, develop private and industry partnerships and form a foundation for private donor/sponsor activity. In the current year, Dr. Anthony Blikslager has been appointed as Assistant Department Head for Equine Medicine, working to establish academic-private sector relationships, bring an industry perspective to the development of our program and convey to the horse-owning public the significant progress and accomplishments of the program.

The CVM has restructured the oversight of the facility at Southern Pines, formally known as the Veterinary Equine Research Center and made it a remote site of the Veterinary Teaching Hospital under the Associate Dean and Director of Veterinary Medical Services. The facility is now the NC State Equine Health Center at Southern Pines, and is providing state of the art equine reproduction services, including embryo transfer, as well as providing equine podiatry and lameness service. The College and VTH are both investing in facility improvements with the goal of continuing to expand equine services and the CVM presence in the Southern Pines area.

The Director of the Equine Health Program has been funded on a part-time basis from the dean's office and is now fully funded between the Dean's Office and the VTH. The Dean's Office is also funding the administrative stipend for the Assistant Department Head, and is providing administrative support for the Program.

5. Animal Welfare, Ethics and Public Policy

With continued progress toward scientifically and technologically intensive modalities of animal care, and sustainable animal resource use, it is imperative that the College establish leadership in complementary programs focused on the humane and ethical care of animals within our society. Over the past five years, through the Campus-Community Partnership Program, the College has taken a regional leadership role in shelter animal medicine and the issues of marginalized companion animals within central North Carolina. It is now time to build on this start and develop a comprehensive animal welfare program that includes an extensive student/public education element, and a public policy research and development component. It is also necessary to move beyond issues relating exclusively to companion animal welfare, and lead the national discussion of agricultural, laboratory, zoological and wild animal welfare.

Outcomes: It is a clear objective that within a 3-5 year period this program achieve the status of a University recognized Center for Animal Welfare Studies, and be nationally and internationally recognized as a model for combining effective public engagement, professional and graduate education and public policy research. Some of the issues Animal Welfare, Ethics and Public Policy (AWEPP) seeks to address include diminishing pet abandonment; decreasing an individual's propensity for violence; decreasing animal abuse and fighting; providing comfort to individuals dealing with the death of a companion animal; enhancing quality of life for the elderly, disabled or mentally ill; fostering resilient individuals and families; enabling advances in animal-assisted therapy and rehabilitation; and understanding animal behaviors.

Resources: To accomplish this ambitious goal, we need key faculty and support staff, and a highly visible outreach program that will extend current community and academic partnerships and encourage private and foundation based donor activity. Essential to this strategy was the hire of the Director of AWEPP. We are

currently recruiting for additional field veterinary personnel and have permanent technical staff to support field operations. Administrative support is also being provided through the Dean's Office. The Director's salary is currently funded through short-term use of lapsed salary and this compact requests permanent funding for the Director and administrative staff who will build this important program to a sustainable level.

Initiative Updates

6. Preparing the Veterinary Professional Workforce for the 21st Century

The veterinary medical profession is facing significant challenges and opportunities. This College is addressing the issues facing the Veterinary Professional through a combination of curricular changes and enhancements:

Curriculum Revision: Preparing students for a more demanding future Knowledge in the veterinary medical field is increasing at a tremendous rate. It is no longer possible to educate veterinary students with all the skills and knowledge necessary to be proficient in treatment of all animal species. There are concerns among veterinary practitioners that new graduates lack the skills necessary to be economically productive when they graduate, contributing to low starting salaries. In order to better prepare our graduates for their future careers, the CVM regularly reviews curriculum and is actively addressing new teaching opportunities to meet the future needs of veterinary medicine.

Teaching Animal Unit (TAU): The Teaching Animal Unit (TAU) is unique to NCSU-CVM in that it provides live animal instruction regarding health maintenance and production of farm animals and horses. It provides an opportunity for students to develop confidence in handling and managing these animals and understanding production management, food safety, housing, biosecurity and animal welfare. For many students, it is the first opportunity to familiarize themselves with and understand animal agriculture. In addition, students are exposed to issues of production management, food safety, housing, animal welfare, biosecurity, and environmental regulations. The College continues to support the TAU with facility improvements, (animal housing, etc) and is currently finalizing the installation of fiber to the barns and TAU offices. The full Internet access will support a web-cam system for monitoring animal care, particularly during foaling/lambing/calving season.

CVM PDA Project: The College of Veterinary Medicine continues implementation of its handheld computing initiative. Color screen Personal Digital Assistants and 802.11b wireless connectivity modules are distributed to students in all classes. PDAs and communication modules are also distributed to instructional faculty. The College is currently implementing a wireless plan that will provide full wireless Internet access for the entire main building of the CVM.

Image Database: The College has several digital image management systems. Continued implementation of the systems will allow faculty to share data image resources, decrease the duplicative production of images for multiple faculty members, and improve student-learning outcomes by allowing students to easily retrieve images representing the many topics studied in the DVM program. With the expansion of access to this system, a new server has been ordered, as part of a replacement scheduled approximately every three years.

Veterinary Teaching Hospital –Emergency Services: An emergency service, staffed by veterinarians hired by the VTH, was initiated in February 2004. The Service is staffed by 2.5 fte clinical veterinarians, supported by several House Officers, and two shifts veterinary technicians. The Service operates from 5pm to 8am weekdays, and provides 24-hour coverage on weekends. Students also rotate through the service, gaining hands on experience in primary care cases, broadening their experience beyond the secondary and tertiary referral cases seen through the regular hospital caseload. The College provided salary support for the clinical veterinarians for two years, as there were not sufficient staffing resources to manage the additional caseload. Currently, the Service has expanded sufficiently to cover all additional expenses.

7. Biomedical Engineering

The CVM is the only health professions professional college at NC State. We have the faculty expertise (anesthesia, surgery, imaging, and in clinical pathology and pathology), experience (about 17,000 cases per year of spontaneous disease in animals) and facilities (for housing and care of laboratory animals) to make significant contributions to the Biomedical Engineering program. The desired outcomes are an expansion of multidisciplinary research programs within NC State and increased availability of engineering expertise for CVM

faculty. Resources are needed to create new positions with joint appointments between BME and CVM. In addition, BME research space is needed, possibly on the developing Centennial Biomedical Campus.

8. Diversity

Veterinary medicine as a profession has relatively few African Americans with most being graduates of Tuskegee University. The number of minorities in our national applicant pool and in our student populations is relatively low at about 2%. There is a need to increase the number of underrepresented people in our profession so that the profession can provide for the animal health care needs of an increasingly diverse population in the state, region, and meet our opportunities in the world. The CVM Director of Diversity has developed a comprehensive approach to increasing the diversity of the College, including:

- Laboratory Animal Scholars Program
- Tuskegee Visiting Veterinary Scholar Program
- Diversity Enhancement House Officers
- Mentoring Program
- Recruitment
- CVM Professional Diversity Development

We continue to present college-wide programs that are held to address issues of climate for diversity. The incoming class for Fall 2005 had the highest number of minority students in the history of the CVM.

9. Center for Marine Science & Technology (CMAST)

The Center for Marine Sciences and Technology (CMAST) was developed to establish the first coastal facilities for NCSU marine sciences research and teaching. The CVM is one of three colleges with major participation in the center. Faculty from the CVM have been key players in the planning and operation of CMAST and its facilities. Founding programs of the center included Environmental Health and Food Safety, and have integrated veterinary medicine with marine biology, fisheries science, food science and physical oceanography. The cooperative and collaborative resources in Morehead City and the talents of key faculty provide the CVM with the best opportunity for development of marine veterinary medicine of any veterinary college in the United States.

Support of individual faculty assigned to CMAST is provided by their departments and grants, and varies. Basic support (local phones, internet, building upkeep) is provided through the CMAST operations budget, which is shared by PAMS, CALS and CVM. Only one of the 3 new CVM positions projected to support CMAST is currently funded; it is anticipated that a Veterinary Marine Diagnostic Pathologist and an Environmental Toxicologist positions would greatly enhance the productivity at CMAST. There is currently a proposal for construction of a dorm facility at CMAST, and the CVM has pledged to support the shared cost of the facility.

APPENDIX 11-8: COMPARATIVE DATA REPORT

Comparative position (relative ranking) among 28 US colleges based on data from the Comparative Data Report (Association of American Veterinary Medical Colleges):

Category	Specific Item	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Financial	Total Revenue	8	9	8	9	10	9	8
	State Appropriations	5	4	5	5	5	5	5
Faculty	Total Faculty (FTE)	6	4	3	4	4	5	5
	Total Women Faculty (FTE)	4	4	5	5	7	6	10
	Total Minority Faculty (FTE)	9	4	11	4	2	4	7
	Mean Salary Professor	9	12	11	13	12	10	10
	Mean Salary Associate	9	8	7	8	10	11	13
	Mean Salary Assistant	3	8	5	5	8	8	12
Students	Instructional Expenditures	6	10	8	8	11	11	10
	# DVM Students	20	19	17	19	20	20	20
	# Minority Students	20	20	16	16	22	20	11
	Tuition & Fees - Residents	27	27	27	20	25	24	28
	Tuition & Fees - Nonresidents	10	12	14	6	8	12	20
	Mean Educational Debt	26	27	26	23	24	24	12
Hospital	Revenue	16	16	16	15	15	15	6**
	Teaching Hospital Expenditures	12	12	11	12	12	15	9
	# Interns	6	8	9	7	11	13	9
	# Residents	5	4	6	10	12	8	5
	# Small Animal Patient Visits	NC	10/16*	9/14*	8/15*	9	12	10
	# Equine Patient Visits	NC	12	15	16	26	17	11
	# Animals treated, Bovine Field	4	9	10	15	16	18	15
Research	Funded Extramural Research	NC	12	12	12	15	17	14
	Research Expenditures	6	5	7	7	6	7	15***

NC = not comparable

* Dog/Cat

** In hospital, now include practice plan in hospital revenue. Previously not included.

*** In research expenditures, previously included % of salary allotted to research FTE. Now salary is not included.

APPENDIX 11-9: CLINICAL COMPETENCIES

Husbandry/Restraint/Routine Client Education skills

- Demonstrate the ability to identify the major categories for common domestic species. Includes being able to identify yearling heifer, steer calf, brood cow, etc. Identify common coat colors in the horse, mare, gelding, stallion, foal, yearling.
- Demonstrate the ability to safely catch and restrain a horse, a cow, a pig and a sheep. Includes haltering, leading, twitching, restraining for venapucture, and picking up feet.
- Demonstrate a quick release knot and a quick-release halter tie or a quick release tail tie.
- Demonstrate the ability to safely catch and restrain a dog, a cat, a bird species, a reptile species, one small mammal other than a dog or cat.
- Demonstrate the ability to observe animal and state whether behaviors observed are normal/abnormal, one large animal species, one small animal species, one bird species, one reptile species, one small mammal other than dog or cat, one species of choice
- Demonstrate the ability to identify and evaluate basic large animal foods types: at least 3 types of hay, 2 types of grain, 2 major pig feeds
- Demonstrate ability to counsel potential owner on pet/animal selection criteria (eg:spp/breed vs. owner lifestyle)
- Demonstrate ability to educate owner on housing needs/socialization needs and methods /nutrition/ training (including house-breaking, if appropriate) and normal reproduction for one small animal and one large animal species
- Demonstrate ability to counsel owner on core vaccination requirements for one small animal and one large animal species
- Demonstrate ability to counsel owner on parasite control regimes for one small animal and one large animal species
- Demonstrate the ability to counsel potential owner on selection of, biological requirements of, and proper husbandry techniques for a zoological species commonly seen in practice.

Physical exam skills

- Perform basic physical exam dog, cat, horse, cow or small ruminant, pig, one reptile species, one bird species one small mammal other than dog or cat, one other species of your choice. Includes TPR, demonstrating the ability to localize and describe sounds in the thorax, localize and demonstrate organs within the abdomen, demonstrate abdominal palpation and auscultation. Must know normal TPR for a small mammal, dog, cat, horse, and cow. Must be able to name and identify major lymph nodes in appropriate species. Must be able to perform rectal exam and express anal sacs in dog.
- Body condition scoring in dog, cat, horse, cow
- Perform the following specialty exams :

  Orthopedic (lameness) exam on a small animal patient and a horse, including naming and identification of all major joints, recognizing normal angles and range of motion for major joints and the hoof, use of a goniometer, use of a hoof tester, use of a hoof pick, use of a hoof gauge, flexion tests, thigh circumference measurement in dog

  Neurologic exam small animal patient, horse, must demonstrate:
  Patellar reflex
  Withdrawal reflex
  Panniculus reflex
  Deep pain assessment
  Menace response
  Palpebral reflex
  Pupillary light reflex
  Conscious proprioception
  Hopping
  Bladder palpation/expression

  Ophthalmic exam, including use of direct and indirect ophthalmoscope, ocular pressure measurement, small animal patient, horse. Must demonstrate:
  Menace response

Pupillary light reflex
Dazzle reflex
Schirmer tear test
Fluoroscein staining

Dermatologic exam, as appropriate for patient. Must demonstrate:
General dermatologic exam
Recognize primary and secondary dermatological lesions
Otic examination
Skin scrapings - deep / superficial
Skin cytology - tape/swab/aspiration
Otic cytology
Site selection and indications for for wedge/punch skin biopsies
Appropriate methods of collection of samples for bacterial / fungal culture
Woods lamp examination
Trichogram

Cardiovascular exam, including identifying, describing, and assessing the clinical significance of transient heart sounds and murmurs, examining arterial and venous pulses, obtaining a resting standard 6-lead EKG, accurately measuring noninvasive arterial blood pressure in small and large animal patients

Oncologic exam, including tumor map, caliper measurement, fine needle aspirate, lymph node palpation and identification

Reproductive exam:
Obtain and interpret a vaginal smear in the bitch.
Conduct a pregnancy exam on a bovine, equine, and canine female.
Prepare and evaluate semen from either a stallion, bull, or a stud dog.
Conduct an examination of the external genitalia of the intact bovine, canine, and equine male and female.
Properly describe and correct malpresentations, positions, and postures in a case of bovine or equine dystocia. They should also be able to place obstetrical chains properly on either the fore or rear limbs of a bovine or equine fetus.

Sample taking

- Obtain a blood sample dog, cat, horse, cow, sheep, pig, one bird species, one reptile species, one small mammal other than dog or cat, one other species of your choice.
- Collect blood using needle and syringe
- Collect blood using vacutainer.
- Obtain a urine sample using catheterization
- Obtain a urine sample using cystocentesis
- Obtain a milk sample from a cow for mastitis evaluation
- Obtain a fecal sample
- Obtain a cloacal culture (bird)

Radiology, Necropsy, Clinical Pathology

- Perform radiographic exams for 5 patients (position, create, process, interpret radiographs)
- Perform complete necropsy on two animals of different species. Be able to select a pig from a group for post-mortem examination. In the pig, be able to identify major lymph nodes, tonsils, area of lung most affected by pneumonia, sites of ulcers.
- Process a blood sample (PCV, TS, glucose, BUN, make blood smear, separate serum, count cells and platelets)
- Process a urine sample (dipstick, specific gravity, cytology)
- Examine a fecal sample for parasites
- Perform an ELISA test

Basic medicine skills, experience, problem solving and case management

- Obtain a complete clinical history for 6 patients, including one special species patient. Obtain client histories with clinician supervision, demonstrating appropriate body language, eye contact, appropriate language, respect for client's emotions and view of the problem.
- Define "chief complaint" and problem list for 6 patients, including one special species patient.
- Make a differential diagnosis list for 6 patients, including one special species patient.
- Choose the appropriate diagnostic tests for 6 patients, including one special species patient.
- Create a problem-oriented medical record for 6 patients including one special species patient, demonstrating ability to organize and succinctly state facts and opinions with correct spelling and punctuation.
- Provide oral summary of 5 cases for peers, demonstrating organization and precise language
- Create laboratory flow sheet for 2 individual animals, demonstrate case management using flow sheet
- Follow 5 patients through treatment of a problem
- Discuss case progress with 5 clients, demonstrating ability to address client concerns, to discuss financial matters, empathy with client, appropriate boundaries with client
- Provide oral discharge instructions for 5 clients, demonstrating solicitation of client feedback to assure that the instructions are understood, solicitation of client's point of view and concerns regarding ability to provide treatment, appropriate demonstration of techniques
- Write 5 discharge instructions, demonstrating ability to organize and succinctly state facts and opinions with correct spelling and punctuation
- Perform follow-up phone calls on 5 patients to assure problem resolution or need for continuing diagnostics/therapy
- Participate in medical primary care clinic at least 5 days (wellness clinic, shelter, vaccination clinic, practice)
- Participate in the management of at least 5 medical referral patients (any species)
- Evaluate , workup and properly record a case involving a population of animals.
- Demonstrate oral administration of medications horse, ruminant, dog, cat, one bird species, one reptile species, one small mammal other than dog or cat, one other species of your choice. Includes demonstrating tablet administration, or the use of an oral dose syringe, as appropriate.
- Demonstrate SC administration of medication large animal, small animal, one bird species, one reptile species, one small mammal other than dog or cat, one other species of your choice
- Demonstrate IM administration of medication large animal, small animal, one bird species, one reptile species, one small mammal other than dog or cat, one other species of your choice. Includes being able to show landmarks for muscle groups, knowing muscles used in food animals, knowing pros and cons of each injection site. Specifically be able to discuss sites used for vaccines, large volumes (procaine penicillin in the horse), iron shots in pigs.
- Demonstrate bolus IV administration of medication large animal, small animal, other species of choice. Be able to discuss how to manage perivascular injection of a caustic material.
- Choose, calculate amounts and administer intravenous fluids to 8 animals, to include one bird species, one reptile species, one small mammal other than dog or cat.
- Choose and calculate correct drug dosages for 8 animals, including one patient receiving constant rate infusion drugs and one bird species, one reptile species, one small mammal other than dog or cat.
- Write 5 outpatient prescriptions in a format that would allow them to be filled at a compounding or human pharmacy
- Administer 5 controlled drugs, keeping correct records for each drug.
- Be able to load and operate a projectile drug delivery device (blow gun, air rifle, pole syringe)

Anesthesia and pain management, patient welfare

- Identify parts of an anesthesia machine
- Put together a circle system
- Put together a non-rebreathing system
- Place IV catheter in 3 small animals (dog, cat, small mammal)
- Place IV catheter in 3 large animals (horse, cow, goat, pig)
- Intubate 6 small animals, including at least 2 cats. Intubate or assist intubation of one bird species, one reptile species, and one small mammal other than dog or cat.
- Place blood pressure, ECG, and pulse oximetry monitors on 3 patients
- Perform anesthesia on 5 small animals (one to be a special species animal), including record keeping and demonstrating knowledge of monitoring equipment, anesethesia/analgesia

- Perform anesthesia on 2 large animals, including record keeping and demonstrating knowledge of monitoring equipment, anesethesia/analgesia
- Design pain management/anesthesia regime for 3 small animal surgical patients
- Design pain management/anesthesia regime for 2 special species animals
- Design pain management/anesthesia regime for 2 large animal surgical patient
- Design chronic pain management treatment (any species)
- Perform pain scoring on 5 patients (any species)
- Perform 3 local analgesic blocks on any species. Be able to demonstrate the landmarks for commonly used local blocks (dehorning, standing procedures in ruminants, declaw surgery in cats, etc)
- Perform 1 epidural on any species
- Participate in one euthanasia (any species) and explain indications and methods of euthanasia, including methods appropriate for zoological species commonly seen in practice
- Participate in enforcement of a humane handling issue or Explain humane standards for one population of animals
- Educate one lay person on an animal welfare issue

Dentistry
- Dental exam on small animal patient, including charting of lesions
- Dental exam on a large animal patient, demonstrating the ability to age a horse and a cow by its teeth. Know eruption times used for aging immature animals.
- Demonstrate canine or feline dental cleaning and extraction

Basic surgery skills, experience, and case management
- Demonstrate knot tying (square knot, friction knot, two hand tie, instrument tie)
- Demonstrate correct instrument handling (three point grip, pencil grip, suture cutting)
- Demonstrate basic suturing techniques (simple interrupted, simple continuous)
- Demonstrate pack preparation
- Demonstrate patient preparation
- Demonstrate sterile technique (scrubbing, gowning, gloving, draping, ability to keep a sterile field)
- Demonstrate wound closure, stent use, placement of mattress sutures
- Demonstrate drain placement
- Demonstrate bandaging techniques, small animal
- Demonstrate emergency bandaging techniques, large animal
- Demonstrate bandaging of an open wound
- Demonstrate suture or staple removal
- Act as primary surgeon for at least 10 surgical procedures, including feline castration, feline spay, canine castration, and canine spay
- Participate in the management of at least 5 surgical referral patients (any species)

Emergency and intensive care case management
- Demonstrate thoracocentesis in small animal patient
- Demonstrate abdominocentesis in small animal patient
- Demonstrate tracheostomy
- Demonstrate administration of nasal oxygen
- Demonstrate technique for gaining emergency venous access
- Demonstrate CPR for a small animal patient
- Demonstrate working knowledge of cardiac resuscitation drugs and goals for a small animal patient
- Outline steps for resusciation of either a large or small animal in hypovolemic or septic shock including: goals of therapy, fluid therapy (choice of fluid, rate and amount, IV catheter choice), drug therapy and monitoring response of therapy.

Health promotion, disease prevention, zoonosis and food safety
- Health promotion/disease prevention (see restraint/husbandry/routine education/TAU sections)
- Demonstrate ability to educate lay person(s) on 5 zoonotic diseases including at least one that involves zoological species

- Spend one day with food safety veterinarian and demonstrate ability to educate lay person on 5 diseases transmitted by food, the role of the veterinarian in preventing transmission, and the precautions the lay person should take.
- Evaluate a veterinary clinical facility for environmentally responsible clinical practices including disposal of discarded therapeutic agents, energy conservation, and emissions/discharge management.
- Evaluate an animal production facility (farm, zoo, lab animal) for environmentally responsible practices including waste disposal, human/production animal/wildlife interactions, energy conservation, and emissions/discharge management.
- Fill out and complete a Coggins test form
- Complete a health certificate

Client communications and ethical conduct

- Present one ethical dilemma facing an individual veterinarian or the profession, demonstrate ability to choose a position based on system of values
- Demonstrate the ability to educate lay person(s) on an ethical or welfare issue applicable to zoological species. (Maintaining wild animals in captivity in zoos, as companion animals, Game ranching, Human interactions with urban/suburban wildlife, Wildlife Rehabilitation, Extralabel use of drugs in Wildlife).
- Written Communication (see Medicine skills)
- Oral Communication (see Medicine Skills, Animal Welfare)
- Client sensitivity/Grief counseling - Participate in counseling of a client that has lost an animal *or* Explain stages of grief and techniques for helping client deal with loss
- Teamwork - Be a member of 5 teams and receive passing grades for team participation skills
- Conflict resolution - Present one legal/conflict issue, demonstrating knowledge of the legal issue, both points of view in conflict, suggest possible resolution

Strong appreciation for the role of research in furthering the practice of veterinary medicine

Each DVM student is required to have one research-related educational experience before graduation. Such experiences could include, but are not limited to:

- Being in the Clinician Scientist Focus Area, with completion of its research requirements.
- Performing a summer of approved research at NCSU or another institution.
- Research thesis option within Zoological Medicine Focus Area.
- Successful completion of a research-related selective (i.e. Intro to Research at the CVM, Molecular Medicine Initiative selectives, research selectives personally arranged or already existing such as Advanced Pathology)
- Attending a research-related conference and supplying a three-page report on the experience.
- Attending the annual CVM Research Forum and supplying a three-page report on the experience.
- Attending a research seminar at the CVM, elsewhere at NCSU or at another institution and writing a three-page report on the seminar and one related publication. (Attending clinical conference is not included.)
- Writing and submitting a research proposal to an extramural funding agency.
- Research experiences in Special Topics courses (i.e. Swine Medicine).

The following skills will be assessed in Health Maintenance and Animal Production I, II, III Teaching Animal Unit

Must Learn Skills

Equine

Approach, catch and halter a horse
Lead and turn a horse at the walk
Lead a horse at the trot
Pick up a forelimb and hind limb of a horse
Groom and horse
Use hoof testers
Tie a quick release knot
Use a weight tape
Perform physical exam on adult horse
Perform physical exam on neonatal foal
Perform ocular exam

Place nose twitch
Perform skin fold twitch
Perform ear twitch
Place chain shank over nose
Place chain shank over lip
Complete written physical exam form
Collect blood into a vacutainer
Collect blood using a needle and syringe
Administer an oral medication
Administer an intramuscular injection
Administer an intravenous injection
Administer a subcutaneous injection
Fill out and complete a Coggins test form
Complete a health certificate
Perform lameness exam (including all flexion tests)
Perform neurological exam (including cranial nerve and movement exam)
Pass nasogastric tube

Cattle

Herding Animals
Correctly halter a cow
Tie a quick release knot
Cast a cow with a rope
Perform a Physical exam
Identify methods of identification of animals
Body condition scoring and relation to life cycle
Feed identification
Collect blood sample from jugular
Collect blood sample from the tail vein
Perform and interpret a TB test
Injection site identification (Beef Quality Assurance)
Identify and perform an intramuscular injection
Identify and perform an intravenous injection
Identify and perform subcutaneous injection
Identify needle sizes for IM, SQ, and IV injections
Administer an oral bolus to at least 2 cows
Pass a stomach tube and administer oral fluids
Processing calves:
- Know how to perform all procedures
- Actively perform at least two procedures (tattooing, castration, dis-budding, implanting)

Pregnancy check > 5months
Collect a sterile milk sample
Perform a CMT test
Interpret a CMT test
Properly use a hoof knife
Restrain and lift a foot for trimming or lameness evaluation

Sheep/Goats

Know and use FAMACHA system for parasite control
Blood collection from jugular vein
Identify jugular landmarks, lung fields, rumen location
Determine age of goats or sheep
Perform vaccinations
Perform intramuscular injection (identify sites)
Perform subcutaneous injection (identify sites)
Perform a foot trim
Body condition score a goat or sheep
TB test a goat or sheep
Disbudding procedures and nerve blocks (goat only)

Perform an ultrasound pregnancy diagnosis
Interpret an ultrasound diagnosis
Perform a physical exam
Interpret ultrasound pregnancy diagnosis
Restrain a sheep or goat
Administer an oral medication to a sheep or goat

Swine

Safely restrain suckling, nursery, and finisher pigs
Safely move nursery or finisher pigs between pens or sort within pen
Identify which TAU pig housing facilities are for what age groups
Collect and interpret sow and piglet data to:

- Calculate pigs born alive, total pigs born, number of piglets born alive, percent of piglets liveborn.
- Calculate the total number of pigs weaned, % preweaning mortality for a farrowing group, count # pigs currently in the nursery, and calculate current % nursery mortality.

Identify the major feed ingredients in pig rations
Recognize normal feeding behavior
Perform pregnancy diagnosis in female pigs using different methods
Identify signs of estrus in the female pig
Complete physical examinations on individuals and groups of pigs
Calculate rates of morbidity and mortality
Restrain and collect blood from nursery and/or finishing age pigs
List the key criteria for selection of optimal pigs for diagnostic testing
Identify these key diagnostically significant anatomic structures:

- Tonsils, turbinates, region of stomach prone to ulcers, ileum, spiral colon, lung lobes, lymph nodes

Poultry

Catch and safely restrain a turkey for physical examination
Catch and safely restrain a chicken for physical examination
Perform a basic physical examination on turkey
Perform a basic physical examination on a chicken
Evaluate general health status of a turkey flock
Evaluate general health status of a chicken flock
Perform a cloacal swab on a turkey
Perform a cloacal swab on a chicken
Perform a tracheal swab on a turkey
Perform a choanal swab on a turkey
Collect a blood sample via wing vein on a turkey
Collect a blood sample via wing vein on a chicken
Perform a subcutaneous injection on a turkey
Perform an intramuscular injection on a turkey