



Massey University

Institute of Veterinary, Animal and Biomedical Sciences

Self Study Report

for the

Council of Education

American Veterinary Medical Association

March 2007



Institute of Veterinary, Animal and Biomedical Sciences
Massey University
Private Bag 11-222
Palmerston North
New Zealand

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
SECTION 1 - OBJECTIVES	2
1.2 Major Goals and Objectives of the Institute of Veterinary, Animal and Biomedical Sciences.....	2
1.2.2 How Objectives of the BVSc Programme are Being Met.....	3
1.2.3 Objectives of the Postgraduate Veterinary Science Teaching Programmes	3
1.2.4 Objectives of the Continuing Education and Extension Programmes	4
1.2.5 Objectives of the Research Programme	4
1.2.6 Objectives of Clinical Service.....	5
1.2.7 Objectives in Relation to Staff	5
1.2.8 Financial Objectives.....	6
1.2.9 Objectives in Relation to Facilities and Equipment	6
1.3 Methods to Measure Outcomes and Performance of the Institute	7
1.3.1 Teaching and Learning	7
1.3.2 Research and Postgraduate study	7
1.3.3 Clinical Service	7
1.4.1 Strengths of the Institute	7
1.4.2 Weaknesses of the Institute	8
1.5 Recommendations	8
Appendix 1 - High Level Learning Outcomes of the BVSc Programme.....	9
SECTION 2 - ORGANISATION.....	11
2.1 Flow Charts	11
2.2 University Organisation in Relation to the Veterinary Programme	11
2.2.1 Historical Note on the BVSc Programme	11
2.2.2 College of Sciences Organisation	11
2.2.3 Inter-relationship between the Institute and the veterinary profession	12
2.2.4 Inter-relationship between the Institute and groups responsible for extension and the management of the University farms.....	12
2.3 Organisation of the Institute of Veterinary, Animal and Biomedical Sciences	13
2.3.1 General	13
2.3.2 Human Resource Management	13
2.3.3 Undergraduate Teaching Management	13
2.3.4 Research and Postgraduate Programme Management	14
2.3.5 Management of Clinical Services	14
2.4 Budgetary control.....	15
2.5 BVSc Programme Control	15
2.6 Principal Administrative Officers and Committees Related to the Veterinary Programme	16
2.7 Accreditation of the University and Veterinary Programme	19
2.8 Recommendations	19
Appendix 2.1. Multi Campus Management Structure	21
Appendix 2.2. Management Pathways.....	22
Appendix 2.3. IVABS Matric Management System.....	22

SECTION 3 - FINANCES 24

3.1	Introduction	24
3.2	Revenue	24
3.2.1	Undergraduate Teaching Revenue	24
3.2.2	Research, PBRF and Postgraduate Student Revenue.....	25
3.2.3	Clinical revenue.....	26
3.2.4	Miscellaneous revenue	26
3.3	Expenditure	26
3.4	Summary of IVABS Revenue, Expenditure and Contribution	27
3.5	Capital Expenditure.....	28
3.6	Income and Expenditure of the Veterinary Teaching Hospital.....	28
3.7	Strengths and Weaknesses in Revenues Over the Last 5 Years.....	29
3.8	Trends in IVABS Finances During the Last 5 years and Anticipated Future Trends.....	30
3.9	Recommendations	30

SECTION 4 – PHYSICAL FACILITIES AND EQUIPMENT..... 31

4.1	Narrative Description of Major Facilities	31
4.2	Adequacy of the Facilities.....	34
4.2.1	Classrooms, labs, and computer-aided learning facilities	34
4.2.2	Large Animal Teaching Hospital	36
4.2.3	Small Animal Teaching Hospital	40
4.2.4	Diagnostic Laboratories	43
4.2.5	Animal Facilities for Teaching and Research	44
4.2.6	Research facilities and equipment.....	45
4.2.7	Administration and Staff Offices	46
4.2.8	Service areas for students.....	46
4.2.9	Building Infrastructure, Janitorial services and Waste Disposal.....	47
4.3	Health and Safety	47
4.4	Current Plans for Improvement of Buildings.....	48
4.5	Equipment – general comments	49
4.6	Recommendations	49
Appendix 4.1	Campus Map.....	50
Appendix 4.2	Massey University Farms	51

SECTION 5 – CLINICAL RESOURCES 52

5.1	The Veterinary Teaching Hospital (VTH)	52
5.2	Number and Type of Patients.....	53
5.3	Herd and Flock Health Programmes	56
5.4	Practical Work and Extramural Requirements.....	56
5.5	Contracted Teaching Practices (Externships)	57
5.6	Patient Load in Relation to the Number of Patients of Each Species Necessary for Adequate Clinical Instruction.....	58
5.7	Medical Records.....	59
5.8	Recommendations	59
Appendix 5.1	VTH Stats.....	61
Appendix 5.2	Animal Health Roster.....	64

SECTION 6 - LIBRARY AND LEARNING RESOURCES	67
6.1 Introduction	67
6.2 Study Facilities	67
6.3 Acquisitions	68
6.4 Collections – Statistics and Assessment of Adequacy	68
6.5 Databases	70
6.6 Services to Students	70
6.7 Conclusion	70
SECTION 7 - STUDENTS	71
7.1 Student Enrolments for the Last Five Years	71
7.2 Support Services	72
7.3 Testing and Grading System	75
7.4 Student Information and Advertisements	76
7.5 Other Education Programmes	76
7.6 System used to collect student suggestion, comment and complaint	77
7.7 Recommendations	78
Appendix 7.1 Self-Care BVSc Programme	79
SECTION 8 – ADMISSION AND ENROLMENT	80
8.1 Selection Process	80
8.2 Measures to Enhance Diversity	83
8.3 List of Factors other than Academic Achievement Used as Admission Criteria	84
8.4 Ratio of Applicants to Admissions	84
8.5 Current Plans for Assessing the Success of the Selection Process to Meet the Mission of the Veterinary Programme	84
8.6 Recommendations	85
SECTION 9 - FACULTY	86
9.1 Loss and Recruitment of Faculty	86
9.2 Staff Support for Teaching and Research	87
9.3 Strengths of the Faculty and Support Staff	87
9.4 Credentials of the Academic Faculty	88
9.5 Challenges in Maintaining Faculty Numbers and Quality	89
9.6 Promotion and Tenure Policies	89
9.7 University Policy for the Relationship of Research, Service and Teaching to Promotion	90
9.8 Part-Time Faculty	90
9.9 Faculty Professional Development Opportunities	90
9.10 Current plans/changes in programme direction that would be affected by faculty retirements, recruitment and retention	91
9.11 Recommendations	92
Appendix 9.1 – Teaching Development Courses	93
Appendix 9.2 – List of the Specialty Boards/Colleges Represented on the College Faculty, and the Number of Faculty Represented in Each	93

SECTION 10 - CURRICULUM 95

10.1	Introduction	95
10.2	Overall Objectives of the Curriculum	96
10.3	Major Curricular Changes Since Last Accreditation	96
10.4	Processes Used for Curriculum Assessment	97
10.5	Strengths and Weakness of the Curriculum	98
10.6	Preceptor, Externship and Contracted Clinical Teaching Programmes	99
10.7	Curriculum Digest	100
10.8	Audit of Selected Curricular Content.....	100
10.9	Plans for Curricular Revisions	100
10.10	Recommendations	100
Appendix 10.1 - Veterinary Clinics (227.503).....		101
Appendix 10.2 - Overview of the BVSc Curriculum.....		102
Appendix 10.3 – Audit of Selected Curricular Content.....		104

SECTION 11 – RESEARCH PROGRAMMES..... 105

11.1	Examples of Research Programmes of Emphasis & Excellence	105
11.1.1	Emerging Diseases Affecting Biosecurity, Trade and Public Health	106
11.1.2	Growth and Development and Musculoskeletal Rehabilitation.....	106
11.1.3	Nutritional Management of Animal Production & Diseases	107
11.1.4	Reproductive Management and Diseases.....	108
11.1.5	Spatial Epidemiology	108
11.2	Examples of Evolving Research Programmes	109
11.2.1	Hopkirk Research Institute.....	109
11.2.2	Equine Partnership for Excellence	110
11.3	Breadth and Quality of Institute Research Programmes	110
11.4	Building Research Capability in Strategically Relevant Areas (BRCSRA) Fund ...	111
11.5	Impact of Research on the Professional Programme	111
11.5	Recommendations	112

SECTION 12 - OUTCOMES ASSESSMENT..... 114

12.1	Student Outcomes	114
12.2	Institutional Outcomes	120
12.3	Clinical Competencies Outcomes	121
12.4	Examples of Changes Made to the Resources and Curriculum Based on Outcomes Assessment Procedures	121
12.5	Recommendations	122
Appendix 12.1 Survey.....		123
Appendix 12.2 Learning Outcomes		130

Executive Summary

The principal objective of the BVSc curriculum is to produce a competent veterinary graduate with the entry-level knowledge and skills required by registration bodies in New Zealand, the Commonwealth and North America and a commitment to life long learning. We respectfully submit that this objective is achieved by the Massey University BVSc programme. In addition, we believe that the BVSc programme meets or exceeds the requirements of the eleven accreditation standards. The programme strengths are significant and its weaknesses fittingly addressed by on-going actions (see Section 1.4).

The organisation of the Institute is appropriate to its mission. The financial trends for IVABS over the last 5 years have all been positive. The Library's veterinary science collection meets the needs of the undergraduate and postgraduate veterinary science students. The facilities available for the veterinary programme enable the Institute to meet the objectives of the teaching, research and postgraduate programmes and clinical activities. We have satisfactorily remedied the facilities concerns identified in previous accreditation visits and made many other improvements.

The Veterinary Teaching Hospital has been successful in maintaining the delicate balance between its service, scholarship and teaching functions. IVABS is privileged to have access to a diverse range of small animal, equine and production animal clinical resources at a single location. The clinical resources have been increased sufficiently to meet the needs of the expanded class and to provide students with opportunities to achieve a higher level of competency in routine clinical procedures than previously. The pastoral production animal teaching and research is a notable strength of the Massey University veterinary programme.

Prospective students are provided with easily accessible and understood requirements and a fair and unbiased selection process is used for admission. The students admitted to the programme are well supported by committed teaching-orientated staff. Examination systems are fair, catalogue information is accurate and appropriate and feedback is encouraged and acted upon through a variety of formal and informal systems. The student essentials in place ensure that well educated and flexibly prepared veterinarians graduate from the programme. Graduates are readily employed in New Zealand, Australia, Britain and increasingly, the United States.

IVABS has sufficient numbers of appropriately qualified staff to provide a high quality education for our students and to meet the mission of the Institute. The current curriculum meets the learning outcomes of the BVSc programme, provides a sound understanding of basic biological principles, pathophysiology and the applied clinical skills of veterinary science. The curriculum is well structured, has the appropriate content, is extensive in scope and is rigorously assessed. The Institute has a vigorous research portfolio that makes a significant contribution to the prosperity of New Zealand and the knowledge of the global veterinary profession and enriches the educational environment.

Teaching, research and clinical standards and the outcomes of student learning are objectively and exhaustively assessed and the results used effectively to improve the programme.

Section 1 - Objectives

1.1 Objectives of Massey University & the College of Sciences

The objectives of the Institute of Veterinary, Animal and Biomedical Sciences (IVABS) and the veterinary programme are best viewed in light of the objectives of Massey University and the College of Sciences, its parent organisations. Please see the University (<http://www.massey.ac.nz>) and College (<http://www.sciences.massey.ac.nz>) websites for an introduction to these objectives.

1.2 Major Goals and Objectives of the Institute of Veterinary, Animal and Biomedical Sciences¹

Vision Statement

“To be a world leader in the advancement and dissemination of knowledge regarding sustainable productivity, health, welfare and conservation.”

Mission Statement

“To enhance animal and human well-being by promotion of the health, welfare and sustainable productivity of domestic animals and the health and welfare of humans and wildlife.”

Core Values

Quality

Mutuality

Collegiality

Responsibility

Financial sustainability

1.2.1 Objectives of the Bachelor of Veterinary Science Programme

The principal objective of the BVSc curriculum is to produce a competent veterinary graduate with the entry-level knowledge and skills required by registration bodies in New Zealand, the Commonwealth and North America and a commitment to life long learning.

The nature of veterinary practice in New Zealand requires the BVSc curriculum to provide a fundamental level of competency in all domestic species and in meat hygiene and public health. Nevertheless, a growing need is recognised to provide undergraduate electives to enhance the skills of graduates entering some areas of the profession.

The Programme Director of the BVSc programme seeks advice from a committee composed of individuals drawn from all sectors of the animal health industry. This Strategic Advisory Committee for the BVSc has recommended the “high level” learning outcomes listed in Appendix 1. These high level learning outcomes are supplemented by learning outcomes for each paper and by a skills list (see section on the Curriculum).

¹ Derived in part from the strategic plan of the Institute and the “Learning Outcomes” document of the Strategic Advisory Committee for the BVSc programme.

1.2.2 How Objectives of the BVSc Programme are Being Met

The objectives of the BVSc programme are being met by a selection policy which includes selection on academic merit and aptitude as its primary tenets, a curriculum that is learning outcome driven, staffing and management policies that recognise teaching as our primary *raison d'être* and thorough quality management and assurance policies.

The learning outcomes are determined in close collaboration with stakeholders such as the Veterinary Council of New Zealand (the licencing body in New Zealand), the New Zealand Veterinary Association, client representatives of the profession and the students. The curriculum spans 5 calendar years and takes the traditional approach of studying the normal animal and its environments, followed by study of the abnormal animal and study of “return to normal” supplemented by studies to enhance animal health, welfare and performance. Problem-based approaches to learning are intercalated into the teaching programme throughout the curriculum. All domestic species along with wildlife are covered. Undergraduate elective tracking from 2007 will involve the ability for students to choose their study programmes in the second semester of the 5th year. Most teaching is conducted “in-house” with the exception of practical experience on farms, “seeing practice” experience in private veterinary practices and short periods of “contracted teaching” externships in the 5th year of the programme.

The class size at admission was recently increased to 76 government subsidised New Zealand residents with the option to admit up to 24 full-fee-paying students from 2002. In order to manage the larger class size and to preserve the current level of clinical experience, we have progressively increased faculty size to maintain a constant staff:student ratio, lengthened the final year of teaching, recruited more case material through a number of initiatives and introduced contract teaching practices to broaden the students' educational experience.

The teaching programme is managed by the BVSc Programme Director who also has overall responsibility for admission policy, curriculum development, quality management and assurance, and student pastoral care. The Head of the Institute is responsible for appointing and managing the academic staff and providing the necessary facilities for teaching.

1.2.3 Objectives of the Postgraduate Veterinary Science Teaching Programmes

- The Institute will provide research-based postgraduate programmes that will train effective and productive researchers, produce veterinary research that is of social and economic value of particular relevance to New Zealand
- The Institute will expand its suite of high quality, distant-education taught-postgraduate programmes that develop specialised expertise building on the undergraduate degree to meet the needs of postgraduates and their employers

The objectives of the postgraduate programme are met by the following degrees:

Doctor of Philosophy (PhD), Master of Veterinary Science (MVSc), Master of Veterinary Studies (MVS), Master of Veterinary Medicine (MVM) and Diploma of Veterinary Sciences (Dip Vet Sc).

The PhD and MVSc are research-based degrees. The MVS is a “block mode” degree of 2 year's duration. It is offered principally in epidemiology. The MVM was approved in 2006. It is a one year distance-education programme currently with a limited repertoire of companion

animal papers but more subject areas are to be added. These new areas will also be taught in a distance education mode. The Diploma is currently a research or taught programme of 1 year duration. It is available in a number of subject areas including veterinary clinical science and public health.

The pastoral care and programme quality of the postgraduate students is managed on a day-to-day basis by the IVABS Research and Postgraduate Studies Office and the programme quality is overseen by the Graduate School of the University.

1.2.4 Objectives of the Continuing Education and Extension Programmes

- The Institute will provide high quality, relevant and accessible continuing education to the veterinary profession.
- The Institute will play an active role in agricultural extension.

The Institute meets these objectives by working closely with the Foundation for Veterinary Continuing Education (VetLearn) of the New Zealand Veterinary Association. The VetLearn office is in the IVABS building. The Director of VetLearn sets the strategic direction for veterinary continuing education in New Zealand after consultation with the profession and by drawing on the advice of IVABS staff as required. IVABS staff (and other providers) are then contracted to provide the necessary teaching. The Editorial Office of the New Zealand Veterinary Journal is also in the IVABS building. This improves the nexus between the profession and the Institute's research and scholarship.

The Institute works closely with agricultural organisations to deliver agricultural extension programmes.

1.2.5 Objectives of the Research Programme

The Institute aims to be a world leader in the advancement of knowledge regarding sustainable productivity, health, welfare, and conservation in order to enhance animal and human well-being.

While recognising the freedom of academic staff to make individual choices about research areas, the Institute has chosen to focus the majority of its research resources on nine broad areas of particular importance to New Zealand in which we have the capability to excel. These research programmes are described in Section 11.

In order to meet the research objectives, all academic staff are expected to conduct research or to undertake scholarly work. The Institute preferentially provides "seed" money to the research programmes from two internal research funds that we are successfully growing. Strong financial incentive is provided to staff for undertaking research and a number of successful commercial research alliances have been put in place. More recently, agreement has been reached to relocate the 60 science staff of the AgResearch Animal Health Platform currently located at Wallaceville in Upper Hutt to Massey University. These staff and two IVABS research teams will be accommodated in a modern, purpose-built, animal health research facility linked to the IVABS building. A joint venture research institute (the Hopkirk Research Institute) has been established between IVABS and AgResearch to facilitate the cooperation of staff between the two organisations.

1.2.6 Objectives of Clinical Service

The role of the Veterinary Teaching Hospital is to provide cost-effective clinical education to veterinary and veterinary nursing students and scholarly opportunities for staff through the provision of high quality clinical services to the public and veterinary profession. To this end the Institute will continue to improve, expand and diversify the first-opinion and referral services it offers to companion, equine and production animal clients and to strive for all of our clinical services to be national centres of excellence.

In order to meet the clinical service objectives, the Institute operates a Veterinary Teaching Hospital (VTH) which undertakes first opinion and referral work. The Hospital has Companion Animal, Equine, Production Animal, Wildlife, Diagnostic and Nursing services each with their own Service Chief. The Hospital is managed by the Service Chiefs in association with a Business Manager and the Director of the Veterinary Teaching Hospital.

Like most Teaching Hospitals around the world, the VTH is experiencing a significant increase in competition from neighbouring general and referral practices. In spite of this, the case load is adequate to achieve our objectives as a result of the commitment and skill of staff and investment in equipment and facilities.

1.2.7 Objectives in Relation to Staff

The human resource policies of the Institute aim to develop energetic, innovative, self-reliant teams with a stakeholder focus. To this end the Institute administration aims to create a supportive and collaborative environment that encourages staff to achieve their best.

The human resource objectives are being met by a “matrix management” structure which places staff in small human resource management groups and encourages them to belong to one or more research programmes(s) and, if appropriate, a clinical service and “activity or interest groups” (eg surgical staff). Leaders of human resource management groups are encouraged to play to people’s strengths in teaching, research and service.

Institute income and expenditure (including all salaries) are managed from the Institute office to avoid barriers to collaboration in teaching and research that sometimes mar Departmental structures.

The majority of research and consultancy income is passed to accounts under the control of the staff who earn the income to provide these staff and their groups a measure of self-reliance. An Institute “tax” on this income is used to support new initiatives and the professional development of staff without great potential to earn external funds.

The Institute strives to preserve reasonable work hours, minimise uneven workloads and to maintain the “academic environment”. Work load is monitored by a work load survey. Direct support of staff is provided through a formal induction programme for new staff, staff development support and a confidential Employee Assistance Programme if required. Every staff member is required to participate in an annual performance review and planning interview to provide encouragement and guidance and to assist with priority setting.

1.2.8 Financial Objectives

The over-riding financial objective of the Institute is financial sustainability through responsible expenditure. The Institute also aims to diversify its income sources to avoid over-reliance on the Government and to increase the discretionary funds available for staff to undertake academic activities.

The financial objectives are being achieved by careful cost restraint, savings through departmental mergers, diversifying teaching, expanding the class size, encouraging individuals and groups to earn external income (via incentives), establishment of ‘spin-off’ companies, increased marketing of programmes and services, renewed efforts to acquire donations and endowments, and by way of strategic alliances and sponsorship. In addition, sustained pressure has been applied to the Government to increase the public funds provided to the University to support veterinary education. The latter was modestly successful in 2001 and again in 2005.

1.2.9 Objectives in Relation to Facilities and Equipment

The Institute has embarked on a programme of minor and major capital works that aims to enhance the safety and appeal of the working environment, to improve the efficiency with which the current space is utilised, to meet accreditation requirements and to underpin the development of the Institute.

The principal goals of our equipment policy are to increase the quality of equipment for research, teaching and service programmes and to increase our investment in information technology for use in the teaching programme.

To meet these objectives, money was set aside in the 1999-2006 University capital works programme to improve the anatomy facilities, build a wildlife ward, redevelop the small animal hospital, extend the small animal hospital reception, build a new farm service “wing”, expand the Large Animal Teaching Unit, upgrade the post-mortem room, diagnostic imaging and surgical teaching facilities, establish an equestrian centre, build a new equine isolation facility, expand the computer-aided learning facilities, revamp the faculty entrance, and start the redevelopment of the Large Animal Hospital and IVABS tower. Most of the capital works listed above have been successfully completed with the exception of the redevelopment of the IVABS Tower. The Tower redevelopment has begun with the upgrading of infrastructure such as lifts and electrical supply but the majority of the refit has been rescheduled to after 2007 as a result of the decision to build the \$17 million Hopkirk Research Institute (the combined AgResearch-Massey animal health research facility) and to consolidate the majority of the College of Sciences undergraduate teaching laboratories in a centralised teaching laboratory complex.

The equipment environment is being improved by better co-ordination of usage, improved use of replacement reserve funds and provision of loan finance to staff for equipment purchase.

1.3 Methods to Measure Outcomes and Performance of the Institute

1.3.1 Teaching and Learning

A range of quantitative and qualitative quality assessment tools are used to assess the quality of the Institute's teaching and the competency and knowledge of the graduates. More details about these assessment tools may be found in the Outcomes Assessment section. These tools include:

- Student Evaluation of Content, Administration and Teaching (SECAT)
- Independent questionnaires
- Staff student consultative committee
- Teaching portfolios
- Informal feedback and reflective practice
- Peer review
- Examination results
- External examiners and practitioners in residence
- Rate of employment of graduates
- Feedback from recent graduates
- Formal and informal feedback from the veterinary profession

1.3.2 Research and Postgraduate study

A variety of measures are used to assess research and postgraduate study including a research outputs database, the value of research grants, formal progress reports on postgraduate students and the number of postgraduate student graduations. Since 2003, the Government has introduced a nationwide peer-reviewed research quality assessment exercise referred to as the Performance Based Research Fund (PBRF).

1.3.3 Clinical Service

Objective measures include case numbers, farm visits, and clinical income according to clinical service unit. Client questionnaires are used bi-annually. Subjective measures include feedback from clients, veterinary and nursing staff and referring veterinarians. These objective and subjective assessments are reviewed by the Clinical Services Management Committee and policy changes made as required.

1.4 Major Strengths and Weaknesses

1.4.1 Strengths of the Institute

- High quality undergraduate students and an established track-record of producing practical, capable graduates with high problem solving skill
- Cordial relationship between students and staff
- Collegial, motivated, well-qualified and pragmatic staff
- Skilled, dedicated and respected teachers
- International profile and experience of many staff
- Close relationship between animal scientists and veterinary scientists

- A leading pastoral animal production and health teaching programme
- Ability and willingness to change
- Involvement of all senior staff in core activities including teaching
- Innovative computer-aided teaching
- Commitment to small group teaching
- Select group of strong research programmes with high impact
- Synergistic mix of undergraduate programmes
- Vigorous postgraduate teaching programme
- Respect and cooperation of veterinary professional bodies
- Stakeholder involvement in determining the learning outcomes for BVSc degree
- Only veterinary school in New Zealand
- Synergistic disciplines in surrounding University and Crown Research Institutes
- Increasingly diverse income streams and a cost-effective teaching programme
- Matrix management with disbursement of majority of external income to earner
- High proportion of first opinion clinical material for teaching
- Strategic alliances with Crown Research Institutes, multinational animal health and nutrition companies

1.4.2 Weaknesses of the Institute

- Modest government funding
- Low income from donations and legacies
- Thin staffing (both academic and technical) in a number of disciplines
- Limited applicant pool for staff positions in some disciplines
- Unpredictable and excessive work loads in some areas
- Limited access to companion animal cases because of provincial location

1.5 Recommendations

We believe that the objectives of the Institute are appropriate to our mission and vision. We respectfully submit that all the objectives are met. The objectives will undergo continual examination in response to the changing needs of stakeholders. Consultation with the BVSc Strategic Advisory Committee will ensure regular review of the learning outcomes of the BVSc by the veterinary profession and allied groups. The Institute's research objectives require annual review, particularly as they relate to the Institute's investment in its principal research programmes. Strategies for the provision of adequate clinical material for undergraduate teaching and staff scholarship also undergo annual review.

Recommendations related to specific objectives, strengths or weaknesses are provided in the other sections of this self-study document.

Appendix 1 - High Level Learning Outcomes of the BVSc Programme

Having completed the BVSc programme, the student should be able to:

1. Generic skills and attributes

- 1.1 Demonstrate a level of literacy and numeracy that enables them to competently undertake the functions expected of a veterinarian.
- 1.2 Understand the basis of effective communication by verbal and non-verbal means.
- 1.3 Be able to communicate effectively orally and in writing.
- 1.4 Possess interpersonal skills that will enable them to interact effectively and professionally with people *with whom* they come into contact in their personal and professional lives. This includes skills in listening and understanding, empathy and respect for others and an ability to handle interpersonal conflict.
- 1.5 Demonstrate the ability to find, utilise and manage information, including the use of modern information technology.
- 1.6 Demonstrate intellectual curiosity and a desire for lifelong learning.
- 1.7 Demonstrate an ability to reason logically and think critically and analytically.
- 1.8 Demonstrate problem-solving ability.
- 1.9 Make valid judgements and deductions on the basis of evidence and information available taking into account, as appropriate, ethical, moral and legal considerations.
- 1.10 Recognise the limitations of their knowledge and experience and be prepared to seek further information, advice or assistance when required.
- 1.11 Demonstrate understanding of the scientific method and the scientific basis of modern veterinary medicine, and the ability to utilise scientific principles in the practice of veterinary science and medicine.
- 1.12 Have well-developed observational skills.
- 1.13 Demonstrate adaptability and the ability to work collaboratively with professional colleagues, support staff and clients.
- 1.14 Understand the principles of quality management and strategic planning.

2. General veterinary and professional attributes and skills

- 2.1 Recognise and comply with all legal and statutory requirements and obligations pertaining to veterinary activity.
- 2.2 Recognise and comply, in all areas of veterinary activity, with the ethical and professional standards expected of a veterinarian and, in particular, those set down in the Code of Professional Conduct.
- 2.3 Recognise the special responsibilities of veterinarians in safeguarding and promoting animal welfare.
- 2.4 Be knowledgeable about animal welfare and able to identify and deal with animal welfare issues.
- 2.5 Recognise the special responsibilities and privileges of veterinarians in society and the need to maintain an appropriate standard of personal and professional behaviour.
- 2.6 Understand the basic principles involved in the running of veterinary businesses.
- 2.7 Recognise and accept their responsibility for maintaining their veterinary knowledge and skills, and for their own professional development and continuing veterinary education.

3. Specific veterinary and professional attributes and skills in relation to the provision of primary veterinary care and other veterinary services

- 3.1 Demonstrate a standard of knowledge and understanding of the preclinical and paraclinical subjects sufficient to enable them to competently undertake the functions of a veterinarian.
- 3.2 Obtain and record a relevant, accurate and detailed history of animals presented.
- 3.3 Approach, handle and restrain animals in ways that are effective, safe, humane and ethical and appropriate to the circumstances.
- 3.4 Carry out and evaluate a thorough systematic physical and clinical examination of animals presented and be able to distinguish between the normal and the abnormal.

- 3.5 Where appropriate carry out, or have carried out, such diagnostic tests and procedures (such as haematology, clinical pathology, radiology and imaging) as are needed to make a diagnosis, ensuring that all samples are properly identified, handled and accurate records kept.
- 3.6 Know when to investigate and be able to evaluate the environment in which the animals under investigation are kept.
- 3.7 Carry out a routine post-mortem examination of common domestic animals², record and report observations and initiate further diagnostic procedures where appropriate. Interpret post-mortem findings and reach tenable conclusions concerning the changes observed.
- 3.8 From the history, clinical examination and interpretation of diagnostic tests and procedures arrive at a tenable diagnosis or diagnostic hypothesis.
- 3.9 Develop strategies that are appropriate to the circumstances for dealing effectively with commonly diagnosed conditions and diseases.
- 3.10 Carry out therapeutic procedures on animals in a manner that will maximise the likelihood of a satisfactory outcome, and minimise the risk of untoward effects with respect to the animals concerned, public health and safety, food safety and quality. Record, monitor and follow up therapeutic responses and modify where appropriate.
- 3.11 Understand the importance of the unique disease status of New Zealand and recognise diseases that may be exotic to New Zealand or notifiable.
- 3.12 Understand the principles and practices involved in controlling the spread of diseases.
- 3.13 Recognise when analgesia and/or anaesthesia are required and be able to safely induce, maintain and monitor analgesia and anaesthesia in uncomplicated cases, and take steps to ensure safe and humane recovery.
- 3.14 Carry out common surgical procedures in uncomplicated cases using appropriate techniques and procedures before, during and after surgery that will minimise the risk to the animal and maximise the likelihood of a successful outcome.
- 3.15 Recognise personal limitations in dealing with unfamiliar, complicated or technically difficult cases and be prepared to seek further advice, assistance or to refer such cases to others.
- 3.16 Deal effectively with the immediate emergency needs of animals ensuring the relief of pain and suffering of the animal(s) and taking into account ethical and legal considerations.
- 3.17 Evaluate the need for euthanasia and, when required, carry it out safely and humanely using procedures appropriate for the species concerned and the circumstances. In addition, recognise the sensitivity of the situation and the need for support of grieving clients and the requirement for the consent of the owner of the animal (where known).
- 3.18 At all times communicate effectively with clients to keep them fully informed, ensuring that they are made aware of the rationale of any actions taken, therapeutic options, likely outcomes, costs, and ethical and legal implications so that they are able to make informed decisions.
- 3.19 Assess the need for and advise on the implementation of programmes to promote the health, well-being and productivity and performance of animals through such means as: dietary management and feeding; vaccination; preventive and curative treatments for common diseases; housing and general management; training and behavioural management and modification.
- 3.20 Provide first level advice on the public health implications of animal diseases.
- 3.21 Understand the procedures and the animal welfare, ethical and statutory requirements involved in the transport and hygienic production and processing of animals for food and other animal products and the responsibilities of veterinarians in relation to these.
- 3.22 Recognise the statutory and regulatory requirements for the inspection and certification of animals and animal products intended for human consumption, and the responsibilities of veterinarians in relation to these.
- 3.23 Understand the basic requirements for the production of safe food and other products of animal origin including the compliance verification and quality assurance procedures involved.

² This includes: cattle, sheep, goats, deer, horses, pigs, cats, dogs, domestic poultry and cage-birds.

Section 2 - Organisation

2.1 Flow Charts

Flow charts showing the organisation of Massey University and the College of Sciences (the IVABS parent organisations) are attached as Appendix 2.1 and 2.2. For further information, please see the University website (<http://www.massey.ac.nz>), a brief introduction to the University (<http://aboutmassey.massey.ac.nz>), the College of Sciences website (<http://sciences.massey.ac.nz>), the IVABS website (<http://ivabs.massey.ac.nz>), the 'vet school' website – the entry portal for prospective veterinary students - (<http://vet-school.massey.ac.nz>), and the Veterinary Teaching Hospital website (<http://vethospital.massey.ac.nz>).

2.2 University Organisation in Relation to the Veterinary Programme

2.2.1 Historical Note on the BVSc Programme

The Faculty of Veterinary Science came into existence when the Foundation Dean, Professor I.J. Cunningham, commenced duties on 1 May 1962 at Massey Agricultural College, as it was then known. The inaugural Faculty meeting was held on 31 October 1962. In 1963 full autonomy and university status was granted to Massey University of Manawatu as it was originally called. The name of the University was subsequently changed by legislation to Massey University in 1966.

The first intake of 32 students into the second year veterinary science course occurred in 1963. Teaching was carried out in temporary premises which had been modified for the purpose. The Veterinary Teaching Hospital opened in 1965. The first BVSc graduates completed their studies in 1967. The intake of students into second year was increased from 32 in 1964 to 48 in 1968. The intake in 2006 is 100 students.

In 1997, the University reorganised into its current College structure and in 1998 the Institute of Veterinary, Animal and Biomedical Sciences was formed by a merger of the previous Veterinary Faculty with relevant sections of the Department of Animal Science and the Faculty of Science.

The first application to the Royal College of Veterinary Surgeons for automatic registration of Massey BVSc graduates was made in 1974. Following the visit of examiners in October 1973, the University was advised in February 1975 that automatic membership of the Royal College for Massey University graduates had been approved and automatic registration upon application in the United Kingdom and certain dependencies has continued since. The American Veterinary Medical Association first approved the degree in 2002.

2.2.2 College of Sciences Organisation

The College of Sciences is one of 5 Colleges in the University. The scientific interests of staff in the College span the full spectrum of basic science, applied sciences, technology and engineering. In developing the organisation of the College, an attempt was made to replace rigid hierarchical management by flexible networks. The result is a matrix management system at University, College and Institute level. The organisation of the College is shown in Appendix 2.2.

The Institute of Veterinary, Animal and Biomedical Sciences teaches 90% of the undergraduate veterinary programme and supervises all veterinary postgraduate studies. The Institute of Fundamental Sciences, the Institute of Molecular BioSciences, the Institute of Food, Nutrition and Human Health and the Institute of Natural Resources teach elements of the 1st, 2nd and third year of the BVSc programme. The Colleges of Business and Humanities and Social Sciences contribute to the 5th year of the programme.

2.2.3 Inter-relationship between the Institute and the veterinary profession

The relationship between the Institute and the veterinary profession occurs at a number of different levels:

- A veterinarian is a member of the University Council
- Members of the profession play a key role in the establishment of the learning outcomes for the BVSc programme via the BVSc Strategic Advisory Committee
- The BVSc Programme Director is a member of the Veterinary Council of New Zealand and the VTH Director is a member of the board of the New Zealand Veterinary Association
- The veterinary continuing education organisation (VetLearn) of the New Zealand Veterinary Association operates from the IVABS building
- Practitioners are closely involved in the education of graduates via 'seeing practice' experiences, 'practitioner-in-residence' programmes, contracted teaching, and mentorship
- Joint business ventures between IVABS, vet. practices and animal health companies
- Liaison committees such as that between the Institute and the Biosecurity and Food Safety authorities of the Ministry of Agriculture and Forestry
- Joint membership of charitable trusts and participation in expert and working committees
- Referring veterinarians as clients of the Veterinary Teaching Hospital and the collegial interactions of a well-knit small veterinary profession

2.2.4 Inter-relationship between the Institute and groups responsible for extension and the management of the University farms

IVABS staff make regular appearances on extension programmes for farmers organised by industry-good groups and the Massey University Centre for Professional Development. The Institute operates a small farm (50 hectares) referred to as the Large Animal Teaching Unit (LATU) for the care of its teaching herds (sheep, cattle and horses). The University operates 2000 hectares of farms to support its teaching and research programmes. Several IVABS staff are involved in providing management advice and veterinary care to the University farms.

2.3 Organisation of the Institute of Veterinary, Animal and Biomedical Sciences

2.3.1 General

The Institute has adopted a matrix management system with the aim of fostering cross-disciplinary research and teaching activity. A diagram of the Institute Matrix Management (Appendix 2.3) is attached to this section. All staff report to the Head of the Institute (HoI) directly or through their Management Group Leaders. The Accountability Statement of the HoI and other senior staff will be included in the supplemental documents available to the site visit team.

The Institute is managed by an executive team. Members of the Executive have pan-Institute portfolios of responsibility that include human resources, undergraduate teaching, research, postgraduate teaching, finance, buildings and equipment (see below). The Executive is chaired by the HoI and includes a technical staff representative and the Institute's business and operations managers.

2.3.2 Human Resource Management

Staff in the Institute are grouped into 10 Management Groups. Some Management Groups are orientated around a clinical service and others around industry sectors or academic disciplines. Management Groups have Group Leaders whose primary responsibility is to support their staff. Group Leaders are elected by the staff they represent. Management Groups differ from academic departments in their financial management (Group Leaders do not manage salary or teaching budgets) and in the disaggregation of the four primary functions of traditional departments (staff management, teaching, research and service). The primary purpose of Management Groups is human resource management. Individual staff in the Groups participate in a variety of teaching programmes, multidisciplinary research programmes (which usually cross Group boundaries), clinical and consultancy services.

The Management Groups in IVABS are:

- Centre for Companion Animal health
- Clinical Services technical/nursing
- Comparative Physiology and Anatomy
- EpiCentre
- Equine Parentage and Genetic Services Centre
- Executive
- Infectious Diseases and Public Health
- Massey Equine
- Pathobiology
- Pastoral Livestock

2.3.3 Undergraduate Teaching Management

The undergraduate teaching programmes to which IVABS staff contribute are led by Programme Directors. They are employed in part by the College of Sciences office to discharge their academic administration duties and by the Institutes to undertake their other

academic duties (e.g. teaching and research). The BVSc Programme Director (currently Professor Williamson) also holds the undergraduate teaching portfolio on the IVABS Executive Committee and is an integral member of the Institute management team but does not “report” (in a line management sense) to the HoI regarding the academic administrative duties of Programme Director (see Programme Management section for a more detailed explanation of this relationship).

The undergraduate teaching programmes in which IVABS staff participate are:

- BVSc
- Dip Vet Nursing
- BMLS
- BApplSc
- BSc
- Dip Agriculture

2.3.4 Research and Postgraduate Programme Management

The postgraduate programmes in IVABS are overseen by the Director of Postgraduate Studies. The Director holds the Postgraduate Studies portfolio on the IVABS Executive Committee and works closely with the Dean of the School of Graduate Studies of the University to harmonise IVABS and University policy in relation to postgraduate studies.

The Director of Research and Commercialisation is responsible for facilitating research by providing guidance to staff and by assisting the Executive determine the Institute’s research strategies. The individual IVABS “Research Programmes” that form the basis of this strategy each have a co-ordinator whose primary responsibility is to facilitate research in relation to the programme.

Staff of the Institute also participate in a number of research centres that are closely affiliated with IVABS but which draw on staff from around the College. The most important of these are the Centre for Welfare Science and Bioethics (the Advisory Board of which is chaired by the Head of IVABS), the Hopkirk Research Institute (a joint venture between AgResearch and the University), and the New Zealand Wildlife Health Centre.

The Institute is associated with a number of ‘spin-off’ companies and trusts. These are Estendart Ltd (a contract research organization), New Zealand Veterinary Pathology Ltd (a diagnostic laboratory), Biocaveo Ltd (a software company), FarmPro Ltd (a software company), Central CityVets Ltd (a companion animal private practice), the Equine Trust and the Companion Animal Health Foundation. Senior IVABS staff are involved in the governance of these companies and trusts on behalf of the University.

2.3.5 Management of Clinical Services

The clinical services in which IVABS staff participate are overseen by Service Chiefs coordinated by the Director of the Veterinary Teaching Hospital. The primary responsibility of a Service Chief is to ensure the efficient running of a clinical service.

The IVABS Clinical Services are:

- Companion Animal
- Equine
- Laboratory Diagnostic Services
- Nursing
- Production Animal
- Wildlife

2.4 Budgetary control

The University receives funds from the Tertiary Education Commission of the Government, the amount of which is primarily determined by the numbers of students enrolling in various programmes and the value of the teaching subsidy provided per student for each type of programme. More recently, a small percentage of these funds (approximately 10%) has been diverted to a fund called the Performance-Based Research Fund. The University competes with other tertiary education organizations to win back a percentage of these funds according to the quality and quantity of research performed and the number of postgraduate students that complete their studies. The income from the Government to the University is augmented by student fees.

The University retains a proportion of the income from the Government and student fees to pay for the national shared services of the University. The remaining income is disbursed to the Colleges. The amount disbursed to each College is determined in part by a set of key performance indicators (KPI) which include such parameters as student numbers, research publications and adherence to budget. Key performance indicator targets are set each year by all Colleges. This “block grant” income is currently referred to as “GL” income - the acronym standing for “General Ledger”. The College of Sciences GL income is then apportioned amongst the Institutes of the College by the Pro Vice-Chancellor of the College.

Institute Heads manage their GL budgets according to various controls. In IVABS, the GL budget is managed from the office of the Institute Head with the advice of the Institute Executive Committee. The GL budget is not devolved to Management Groups.

The University also receives income from the research and consultancy activities of its staff. A proportion (15%) of the income of these activities is retained by the University but the majority is disbursed to research accounts under the direct control of the researcher. In IVABS, the income is “taxed” by a further 5%. The income from the Institute tax is transferred to ‘portfolio accounts’ managed by the Institute Executive members to invest in the equipment, facilities, research and teaching-innovation goals of the Institute. Income in research and consultancy accounts remaining at the completion of the project is transferred to the relevant Management Group recovery or consultancy account. Expenditure of these residual funds is at the discretion of the staff member who earned the external income and the Group Leader, provided the expenditure is consistent with the academic functions of the University.

2.5 BVSc Programme Control

The Programme Director of Veterinary Science is responsible for the undergraduate BVSc veterinary degree programme. This includes determining the learning outcomes of the programme in consultation with stakeholders (via the Strategic Advisory Committee),

structuring the curriculum to achieve the learning outcomes (via the Veterinary Programme Management Committee), student “pastoral care” and programme quality assurance.

The Programme Director reports to the ProVC of the College of Sciences and must liaise with the Institute Heads whose staff teach into the BVSc programme and with academic administrators of the College of Sciences and University for such matters as marketing, admissions, timetabling, examinations, graduation and elements of the quality assurance programme for the degree. The Programme Director is the final arbiter of who teaches what in the BVSc programme and is responsible for resolving competitive bids from different Institutes.

The relationship between the Head of IVABS and the BVSc Programme Director is analogous to that of the partnership between an Executive Dean and Academic Dean in the US system with the exception that the Programme Director has a greater level of autonomy to respond to the needs of the veterinary profession and reports to the same person (the ProVC) as does the Head of Institute.

2.6 Principal Administrative Officers and Committees Related to the Veterinary Programme

University

Professor Judith Kinnear, Vice-Chancellor

Professor Nigel Long, Deputy Vice-Chancellor (Research)

Vacant, Deputy Vice-Chancellor (Academic)

Professor Ian Warrington, Deputy VC, Palmerston North

College of Sciences

Professor Robert Anderson, ProVice-Chancellor, College of Sciences

College Academic Board

This Committee approves new academic programmes and amendments to the University Calendar in regard to College of Sciences programmes. It consists of HoI's and Programme Directors along with staff and student representatives.

Veterinary Programme Management Committee (VPMaC)

VPMaC is chaired by the Programme Director, Veterinary Science. The Committee is comprised of academics drawn from staff teaching into all levels of the BVSc programme and two student representatives. This committee is responsible for the academic management of the BVSc programme. This function includes the review of individual papers (courses) offered within the degree. Another role is to oversee curriculum review and to act as curriculum committee to ensure that the learning outcomes defined by the Strategic Advisory Committee can be achieved by the teaching programme. It is the responsibility of the committee to advise the Programme Director on quality assessment of the BVSc Programme and timetabling. A subcommittee of this committee is responsible for student selection. The Terms of Reference for VPMaC will be available in the Supplements.

Members of the Veterinary Programme Management Committee

Professor Norm Williamson, Programme Director, Veterinary Science

Professor Tim Parkinson, Professor of Veterinary Reproduction (5th year coordinator)

Mr Mark Patchett, Senior Lecturer in Biochemistry

Professor Kevin Stafford, Director of Postgraduate Education (1st year coordinator)

Professor Steve Morris, Professor of Animal Science
Associate Professor Richard Squires, A/Prof. of Veterinary Virology (2nd year coordinator)
Associate Professor Mark Collett, A/Prof of Veterinary Pathology (3rd year coordinator)
Dr Wendi Roe, Senior Lecturer in Veterinary Pathology (4th year coordinator)
Ms Hayley Squance, Veterinary Nursing Programme Coordinator
Current President, Massey University Veterinary Student Association
Current Vice-President, Massey University Vet. Student's Assoc. (Immediate past President)
Mrs Sue Gribbin, Veterinary Programme Administrator, Secretary (in attendance)

Veterinary Programme Strategic Advisory Committee

This Committee is chaired by the Programme Director, Veterinary Science. It is comprised of stakeholders from the veterinary profession representing the New Zealand Veterinary Association, Veterinary Council of New Zealand and key representatives of the animal industries, plus Institute staff and undergraduate students. Its role is to provide advice to the Programme Director on suitable “high level” learning outcomes for the degree. This is a forum to allow feedback on the quality of graduates and identification of any perceived weaknesses in their education. The major role of this committee has been to assist in setting the direction for the development of the BVSc programme.

Admissions Committee

The Admissions Committee establishes the admissions regulations and procedures and oversees the process of admission to the degree. The Programme Administrator and Chair of this committee undertake most of the work (calculating of WGPA's, academic advice as to papers to be taken by those on non-standard programmes, etc) in advance of the meetings of the Selection Committee. The Committee then meets to deal with any difficult cases, plus confirm rankings of candidates for selection.

Academic Promotions Committee

This Committee assesses and ranks promotion applications for the College of Sciences.

IVABS Executive Committee

The Institute is managed by the Executive Committee. This is an advisory committee to the Head of the Institute and members of the committee are appointed by the HoI based on their knowledge and abilities. The HoI has executive authority for the management of the Institute. However, decisions by the Committee are reached by consensus. As mentioned above, the Institute Executive is made up of the portfolio holders, business and operations managers and a technical staff representative. All strategic, policy and fiscal matters are dealt with by this committee and all staff appointments are approved. The portfolio holders bring issues relating to their portfolios to the Executive for debate and advice.

Members of the IVABS Executive Committee

Professor Grant Guilford, Head of Institute, Human Resources Portfolio
Professor Norm Williamson, Programme Director, Undergraduate Teaching Portfolio
Professor Hugh Blair, Deputy Head of Institute, Research & Commercialisation Portfolio
Professor Kevin Stafford, Postgraduate Studies Portfolio
Professor Nigel French, Committee Member
Dr Frazer Allan, Director of the VTH
Professor Joe Mayhew, Committee Member
Professor Elwyn Firth, Committee Member

Associate Professor Bill Pomroy, Equipment Portfolio
Professor Keith Thompson, Buildings Portfolio
Mr Dean Burnham, Technical Staff Representative,
Mrs Bessy Rasmussen, Operations Manager
Mr Brian Korte, Institute Business Manager
Mr Bill te Brake, Institute Business Development Manager

In order to direct as much of our resources as possible into teaching, research and service, an effort has been made to minimise the number of committees operating in the Institute. Previous committee functions have been, where possible, vested with individuals on the Executive (Portfolio Holders) who are expected to consult widely with Institute staff and the Executive but are given the authority to make decisions in relation to their portfolios.

IVABS Group Leader Forum

Most interaction between the Group Leaders and the HoI occurs on a one-on-one basis. Occasionally, however, matters of general concern to a number of Groups are discussed in a Group Leaders Forum chaired by the HoI.

IVABS Undergraduate Teaching Committee

The Undergraduate Teaching Committee is chaired by the holder of the Undergraduate Teaching Portfolio (Professor Norm Williamson) and comprises representatives of all the academic programmes into which IVABS staff teach. The committee has a liaison role and encourages enhancement of teaching by planning and co-ordinating staff development lectures, seminars, tutorials and workshops in association with the Training and Development Unit of the University. Many of these efforts aim at sharing best practice among staff. These programmes also introduce staff to innovative and effective teaching techniques to assist them in reflective evaluation of their teaching methods and the introduction of new teaching methods. The Undergraduate Teaching Committee administers the annual teaching awards aimed at encouraging and recognising teaching excellence.

Clinical Services Management Committee

The Service Chiefs and Business Manager meet fortnightly in a forum referred to as the Clinical Services Management Committee chaired by Dr Frazer Allan, the Director of the Veterinary Teaching Hospital. This committee determines strategy and policy of the Veterinary Teaching Hospital. The day-to-day financial affairs and operational management of the Teaching Hospital are handled by the Director in association with the Institute's Business Manager both of whom report to the Institute Head.

IVABS Health and Safety Committee

This Committee is chaired by the technical staff representative on the Executive Committee. The committee oversees occupational safety and health compliance of the Institute. It also provides a forum for discussion of health and safety issues of importance to staff and provides feedback to the Executive on such matters.

IVABS Information Technology Advisory Committee

This committee is responsible for providing academic oversight to the Institute's developments in computer-aided learning.

Massey University Veterinary Students' Association

The Massey University Veterinary Students' Association (MUVSA) represents the veterinary students in various fora including the Veterinary Programme Management Committee, Staff/Student Consultative Committee and the Massey University Students' Association. The President of MUVSA regularly confers with the Programme Director and occasionally with the HoI.

2.7 Accreditation of the University and Veterinary Programme

The University is an autonomous institution in accordance with the Education Act 1989. It has been granted the right to award degrees and does so under the auspices of the New Zealand Vice Chancellor's Committee, Ministry of Education and Tertiary Education Commission of the New Zealand Government.

Six yearly (approximately) external reviews of educational standards for the BVSc degree are made by the Council on Education of the American Veterinary Medical Association and the Veterinary Schools Accreditation Advisory Committee (VSAAC) of the Australasian Veterinary Boards' Council on which are represented the Veterinary Council of New Zealand and the New Zealand Veterinary Association. The AVMA last visited Massey University in 2002. The last visit of VSAAC was in September of 2004 and it led to a recommendation to grant accreditation to Massey University BVSc graduates for registration on application in New Zealand, Australia and the United Kingdom until 2010.

2.8 Recommendations

The matrix organisation of the Institute has proved successful in garnering widespread support from staff and fostering a 'one institute', strategic focus at the Executive level. It is a flexible and cost-effective approach which facilitates cooperation across the teaching and research programmes of the Institute but does require considerable explanation to staff and visitors familiar with traditional hierarchical management systems.

The partial disaggregation of academic programme management from Institute management was challenging for staff in the early stages of its introduction and resulted in some confusion and duplication. More recently, as accountabilities of the different positions have become more clearly defined and feedback loops better understood, the benefits of this approach are being realised. In particular, the greater involvement of stakeholders in setting the learning outcomes of the programme and the greater flexibility with which the Programme Director can comply with the needs of the profession are important gains.

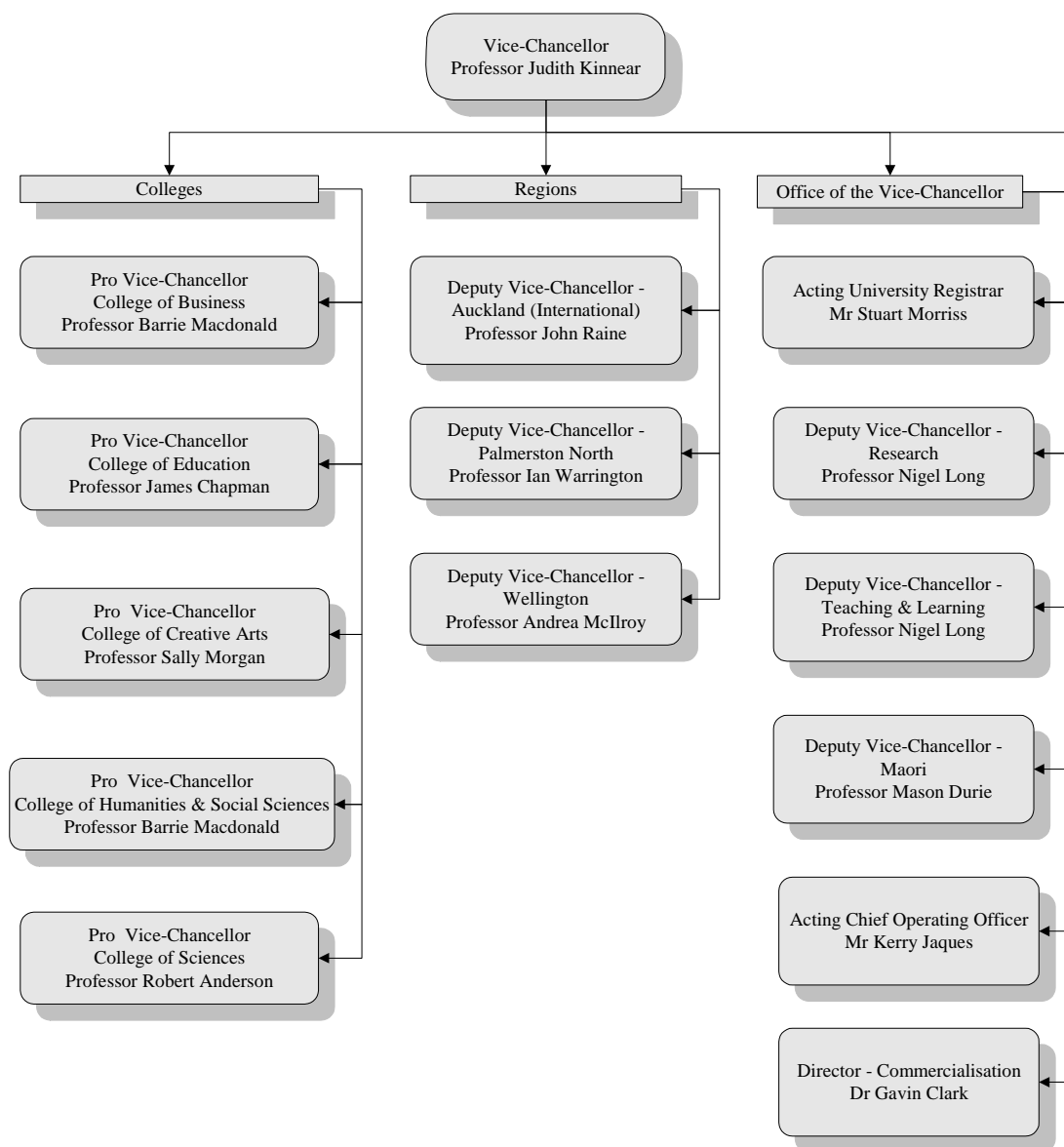
The structure of the Veterinary Programme Management Committee and its role also as a curriculum committee proved invaluable during the curriculum review since members representing the various Institutes teaching into the BVSc understood the background and reasons for the changes being made. The transfer of the responsibility for the management of academic programmes to the College of Sciences office from the Institutes meant that it was accepted by the various Heads of Institute whose staff teach into the BVSc that the revised curriculum was being developed for academic reasons and not for reasons of capturing income for a particular Institute. This management structure allows the programme to be developed to best serve the various stakeholders without change being hampered by a focus on possibly negative resource implications for a particular Institute.

Currently the benefits of the IVABS management system outweigh the disadvantages and we intend to continue with this management model for the foreseeable future. However, we anticipate continued evolution of the approach to promote further gains in administrative quality, efficiency and effectiveness. To this end the Institute Operations Manager is systematically reviewing several facets of the management system particularly as they relate to the support and supervision of technical and administrative staff.

Appendix 2.1.



Multi Campus Management Structure

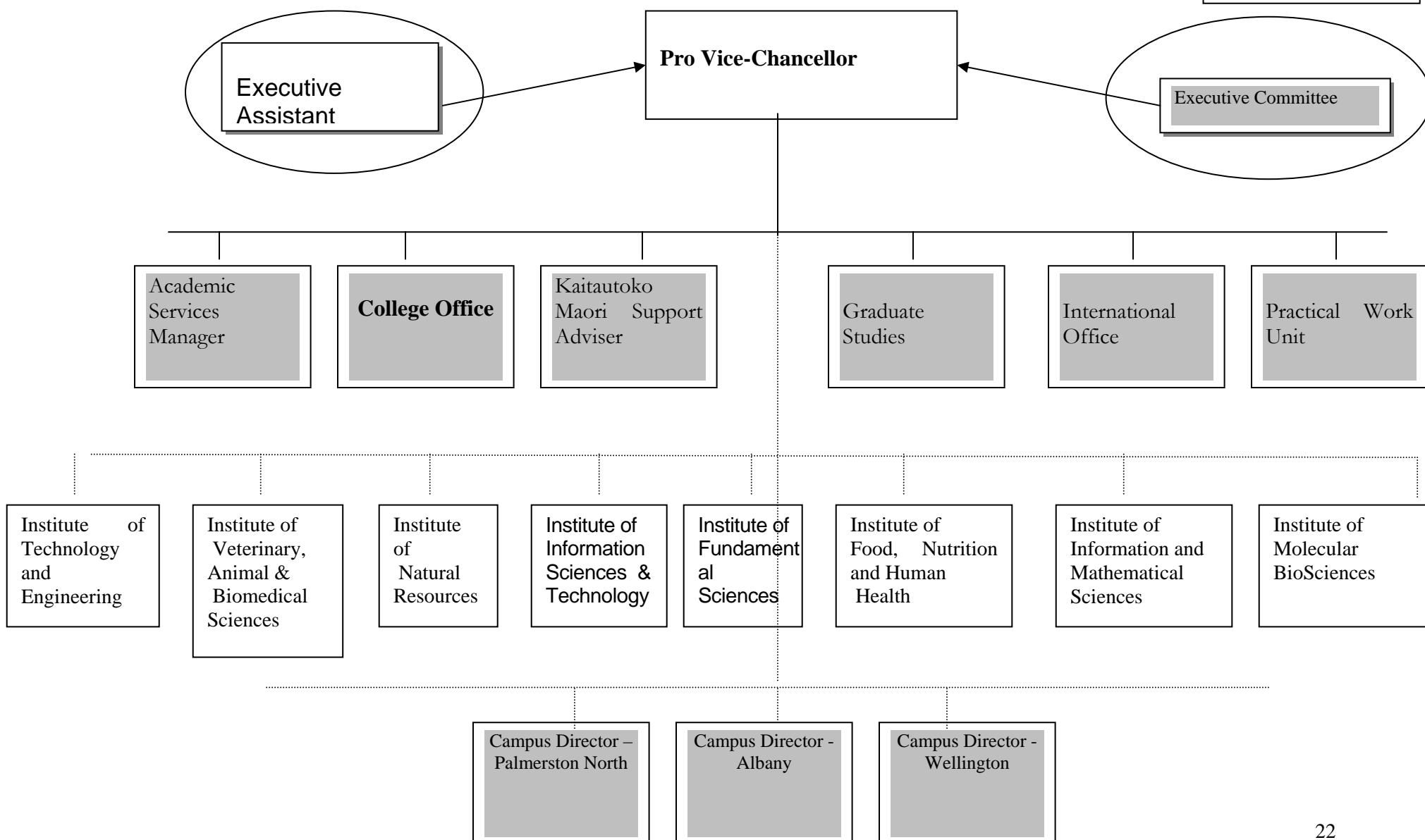


May 2006

Appendix 2.2.

COLLEGE OF SCIENCES PRO VICE CHANCELLOR'S OFFICE
MANAGEMENT PATHWAYS

Legend
Shaded area
constitutes PVCs



Appendix 2.3.

IVABS MATRIX MANAGEMENT SYSTEM

M A N A G E M E N T G R O U P S ²	Portfolios of IVABS Executive ¹							

KEY POINTS:

- Executive portfolios cover pan-Institute domains. The holders are expected to provide 'in-house', specialized leadership in their portfolios to all Institute staff.
- Management Groups have a primarily human resource function. They act as 'home base' and play a key role in the mentoring and support of staff.
- Irrespective of Management Group, appropriate staff members are free to participate in any academic programme, clinical service or research programme.
- The academic programmes are managed on an inter-Institute, College wide basis to encourage co-operation across the College, responsiveness to stakeholders, and continuous improvement.
- A small number of multi-disciplinary over-arching research programmes and Centres were selected to encourage research effectiveness and competitiveness.

1. Portfolios of Executive

- Human Resources, Strategy and Policy
- Research and Commercialisation
- Postgraduate Studies
- Undergraduate Teaching
- Finance
- Veterinary Teaching Hospital
- Equipment
- Buildings

2. Management Groups

- Companion Animal Health Centre
- Comparative Physiology and Anatomy
- EpiCentre
- Equine Parentage & Genetics Centre
- Executive
- Infectious Disease and Public Health
- Massey Equine
- Clinical Services Technical (Nursing)
- Pastoral Livestock
- Pathobiology

3. Clinical Services

- Companion Animal
- Diagnostic Laboratory
- Equine
- Production Animal
- Nursing
- Wildlife

4. Academic Programmes

- BAplSc
- BMLS
- BSc
- BVSc
- DipAg
- DipVet Nursing
- Masters
- PhD

5. Research Centres and Programmes

- Wildlife Health Centre
- Welfare and Bioethics Centre
- Animals in Society
- Emerging Diseases Affecting Biosecurity, Trade and Public Health
- Growth & Development & Musculoskeletal Rehabilitation
- Mycobacterial Diseases
- Nutritional Management of Pastoral Animal Production and Health
- Reproductive Management and Diseases
- Spatial Epidemiology
- Wildlife Health and Conservation

Section 3 - Finances

3.1 Introduction

The funding of New Zealand universities has undergone a significant overhaul since the last AVMA visit in 2002. The changes have been generally favourable for Massey University and IVABS and the financial performance of the Institute has strengthened considerably during this period (see Table A-C).

The Massey University financial management systems have also evolved since 2002. Unlike many universities, heads of academic units at Massey are held accountable for revenue, expenditure and, in particular, ‘contribution to national shared services’. The latter is the excess of revenue over expenditure. All three parameters are tracked with monthly budget unit reports. The University meets the costs of national shared services (e.g. works and services, capital projects, enrolment, library, marketing) through the ‘contribution’ from academic units – hence the keen interest of central university administrators in this financial parameter.

The annual expenditure budget for IVABS is negotiated by the Head of Institute with the Pro Vice-Chancellor of the College of Sciences who in turn negotiates the College’s budget with the Vice-Chancellor. The IVABS expenditure budget is influenced by College of Sciences strategy, the Institute’s projected revenue and the ‘contribution’ required to help the College meet its ‘contribution target’. The contribution required from IVABS is affected by the financial performance of the other Institutes in the College.

The expenditure budget of IVABS is derived from two main sources, the teaching revenue and the research/consultancy revenue. The former is referred to as “General Ledger (GL) funding” and is equivalent to “block grant”. The research and consultancy income is referred to as “Contracts and Trading” or ‘project’ (“PR”) income.

3.2 Revenue

3.2.1 Undergraduate Teaching Revenue

The bulk of revenue earned by universities from the Government is based on the number of equivalent full time students (EFTS) taught by each university and the value of the teaching “subsidy” provided per student by the Government, through the Tertiary Education Commission.

The number of Government-subsidised undergraduate veterinary EFTS remains capped by the Tertiary Education Commission at 340. However, following a prolonged period of lobbying focused around the economic impact of IVABS and the veterinary profession, the Government announced in 2005 that the Tertiary Education Commission would significantly increase the teaching subsidy to BVSc students in the ‘clinical years’ of the programme. This increased funding is referred to as the ‘clinical add-on’ and currently is valued at \$5,684 per student enrolled in the second, third, fourth and fifth year classes – or approximately \$1.7 million of additional funding per year across the programme. As a result of the clinical add-on, the per student Government subsidy for clinical teaching in years 2, 3, 4 and 5 of the BVSc increased to \$24,582 per student in 2006 while for years 1 and 2 it remained at

\$18,898. These tuition subsidies will be similar in 2007 although we are expecting a modest cost-of-living increase.

Student fee income augments the teaching revenue earned by the University from the Government. Veterinary student fees in 2006 are now \$7,110 (including GST) per annum for New Zealand residents and \$42,000 per annum for full-fee paying students. The Government prevents universities raising fees more than 5% per annum.

The bulk of the teaching revenue earned by IVABS (70%) is derived from the veterinary teaching. However, substantive amounts are also earned from postgraduate tuition (12%), and other undergraduate degrees or diplomas (18%) including the Science, Applied Science, Medical Laboratory Science and Veterinary Nursing programmes.

3.2.2 Research, PBRF and Postgraduate Student Revenue

The Government substantively altered the funding of universities when it introduced the Performance-Based Research Fund (PBRF) in 2003. This is a competitive fund that holds approximately 10% of the Government's tertiary education funding. Tertiary education organisations must compete with each other to obtain money from this fund. The money received by each university from the PBRF is determined by the quality of research of each academic staff member (assessed by peer review of an 'evidence portfolio'), the total research income of the university, and the number of postgraduate student completions. The quality grades of each staff member are averaged and the means and ranges are published by the Tertiary Education Commission as a research 'league table'. The PBRF funding available for each postgraduate student completion is substantive but the majority of this funding was derived by cutting the annual tuition subsidy of each postgraduate student (without a corresponding increase in student fees). This has the effect of strongly incentivising universities to ensure postgraduate students complete their dissertations and reflects the Government's wish to focus more on educational outcomes than inputs in the funding system.

The funding changes resulting from the PBRF were phased in from 2003-2006 and will be fully implemented by 2007. IVABS has done well financially out of this new funding system with new revenue of approximately \$1.75 million being received per year from the PBRF. However, the strong emphasis the PBRF places on research has some perils for a professional school. In particular it heightens the promotion difficulties faced by clinical teachers in comparison to faculty in fundamental disciplines. IVABS has reacted to this by the introduction of a 'clinical track' for professional veterinary clinical educators to ensure that the critical importance of clinical faculty to the professional programme can be recognised and rewarded without the need for stellar research careers.

IVABS has benefited financially in recent years from a growth in research and consultancy income from private sources as well as four other recently introduced Government-funded research initiatives. The four Government funds are listed below and are discussed in the self-study document section on research:

- 'Centres of Research Excellence' (CoRE)
- 'Partnerships for Excellence' (PfX)
- 'Building Research Capability in Strategically Relevant Areas Fund'
- Consortia funding

3.2.3 Clinical revenue

The Veterinary Teaching Hospital (VTH) will earn approximately \$2 million from client fees in 2006 and is paid an annual sum of \$140,000 by IVABS to supplement the costs of clinical teaching. The majority of the salaries of the clinical staff are paid for by IVABS rather than the VTH per se. Instructional integrity of the VTH takes priority over financial self-sufficiency.

3.2.4 Miscellaneous revenue

IVABS earns small amounts of income from other miscellaneous sources including small quantities of endowment and gift income, conference/short course income, and sales and services.

Table A Summary of IVABS Revenue 2002-2006

	2002	2003	2004	2005	2006 ¹
Revenue					
Government teaching subsidy	\$7,233,600	\$7,679,800	\$8,481,500	\$8,913,600	\$10,687,250
Student fee income	\$2,684,100	\$3,257,900	\$4,014,600	\$4,687,500	\$5,621,550
PBRF ²	-	-	-	\$ 607,300	\$1,750,000
Endowment/Gifts ³	-	-	-	-	-
Contract & trading (research, consultancy etc) ⁴	\$5,109,900	\$4,745,200	\$5,218,900	\$6,306,000	\$5,500,000
Vet Teaching Hospital	\$1,660,500	\$1,628,800	\$1,685,100	\$1,838,000	\$2,000,000
Total revenue	\$16,688,100	\$17,311,700	\$19,400,100	\$22,352,400	\$25,558,800

¹ Forecast result

² PBRF – Performance Based Research Fund

³ Endowment & gift income is minor (usually less than \$40,000 per year) and is captured in the contracts and trading line

⁴ Excludes the pharmaceutical contract research income (\$1.3 million) earned by Estendart Ltd that was ‘spun out’ in 2003 and the diagnostic income of New Zealand Veterinary Pathology that was spun out in 2004 (approximately \$80,000 of which was previously earned by the antecedent IVABS clinical pathology laboratory)

3.3 Expenditure

Unfortunately, the University does not monitor all the expenditure categories listed in the AVMA self-study document guide. However, Table B provides a detailed analysis of expenditure by IVABS over the majority of these categories.

Table B Summary of IVABS expenditure 2002-2006

	2002	2003	2004	2005	2006⁵
Remuneration - IVABS	\$6,376,200	\$7,025,400	\$7,563,600	\$8,035,400	\$8,692,000
Stipends	-	-	-	\$85,200	\$72,000
Contract Services Teaching ⁶	\$217,400	\$257,100	\$455,500	\$448,700	\$511,300
Contract Services VTH ⁷	\$140,000	\$140,000	\$140,000	\$140,000	\$140,000
Contract Services Waste	\$75,000	\$78,600	\$87,400	\$67,400	\$85,000
Consumables	\$372,900	\$482,800	\$479,400	\$478,000	\$515,000
Contract & trading (research, consultancy)	\$3,992,900	\$4,958,200	\$4,611,300	\$5,544,100	\$4,300,000
Vet Teaching Hospital ⁸	\$1,660,500	\$1,628,800	\$1,685,100	\$1,703,200	\$1,857,500
Training and Development ⁹	\$9,900	\$9,800	\$12,100	\$9,300	\$12,000
Repairs, maintenance and minor equipment	\$440,300	\$423,000	\$455,900	\$441,200	\$523,300
Computing	\$49,300	\$47,800	\$56,100	\$60,500	\$62,500
Travel	\$59,600	\$69,800	\$55,300	\$79,100	\$70,000
Administrative ¹⁰	\$190,700	\$155,200	\$145,000	\$169,700	\$179,000
Total expenditure	\$13,584,700	\$15,276,500	\$15,746,700	\$17,261,800	\$17,019,600

⁵ Forecast result

⁶ Includes contracted practices, visiting lecturers etc

⁷ Transfer paid by IVABS to the VTH to support clinical teaching

⁸ Total expenditure of the VTH; includes remuneration

⁹ Non-academic staff only

¹⁰ Includes hospitality, postage, telecommunications, printing & publications, subscriptions, vehicles

3.4 Summary of IVABS Revenue, Expenditure and Contribution

Table C shows a comparison of revenue against expenditure of the Institute (excluding the VTH which is not called upon to make a 'contribution' to the University overhead costs). The table highlights the improved financial performance of IVABS and the increased financial contribution to the University. As previously mentioned, the contribution gathered by the University from its various academic units pays for a number of National Shared Services of importance to the Veterinary Programme (e.g. library, student services, etc). The University's capital expenditure budget is also drawn from the contribution and IVABS has benefited from significant capital expenditure over the last 5 years.

Table C Summary of IVABS Revenue, Expenditure and Contribution 2002-2006¹¹

	2002	2003	2004	2005	2006¹²
Total revenue	\$15,027,600	\$15,682,900	\$17,715,000	\$20,514,400	\$23,558,800
Total expenses	\$11,924,200	\$13,647,700	\$14,061,600	\$15,558,600	\$15,162,100
Contribution	\$3,103,400	\$2,035,200	\$3,653,400	\$4,955,800	\$8,396,700
Contribution percentage	20.7%	13%	20.6%	24.2%	35.6%

¹¹ Excludes Veterinary Teaching Hospital income and expenditure

¹² Forecast results

3.5 Capital Expenditure

The College of Sciences is in the midst of a major redevelopment of its facilities – including those in IVABS. This process is being coordinated by the College of Sciences Office and the Deputy Vice-Chancellor for the Palmerston North Campus. All major capital expenditure projects within this redevelopment (defined as projects greater than \$200,000) required a business case that demonstrates a positive net present value for the investment.

Minor capital works are funded by the Deputy Vice-Chancellor's office according to a priority list determined annually. Alternatively, small projects can be funded internally by IVABS from a small fund (\$20,000 pa) derived from the Institute's 'tax' on external (non-GL) income.

Major items of equipment are funded in an annual major capital equipment round following submission of a business case. The Institute maintains replacement reserve accounts for these 'big ticket items' to assist the business case. Some expensive items of equipment are funded on a loan basis in which staff borrow against IVABS reserves to purchase the item of equipment and pay the loan back over a period of up to 5 years. Others are purchased as part of research projects.

Small items of equipment are funded internally by way of a GL capital expenditure account (derived from block funds) and a non-GL capital expenditure account (derived from the IVABS tax) totalling, approximately \$110,000.

Items of equipment less than \$2,000 are not capitalized and are paid for via the consumables budget of the Institute and an equipment budget in the Veterinary Teaching Hospital.

Collectively, these methods have enabled the Institute and Veterinary Teaching Hospital to maintain a modest but adequate suite of equipment.

3.6 Income and Expenditure of the Veterinary Teaching Hospital

The only separate budget units of the Institute are the Veterinary Teaching Hospital (VTH) and the Equine Parentage and Genetic Services Centre. The Equine Parentage and Genetic

Services Centre earns approximately \$375,000 per annum in parentage services. The expenditure of the VTH is summarised in Table D below.

As would be expected for a budget unit in which instructional integrity is expected to take precedence over profits, the VTH budgets for a break-even position each year.

Table D – Income and Expenditure of the Veterinary Teaching Hospital

	2002	2003	2004	2005	2006¹³
Total revenue	\$1,660,500	\$1,628,800	\$1,685,100	\$1,838,000	\$2,000,000
Total expenses	\$1,660,500	\$1,628,800	\$1,685,100	\$1,703,200	\$1,857,500
Contribution	Nil	Nil	Nil	\$134,800	\$142,500

¹³ Forecast result

3.7 Strengths and Weaknesses in Revenues Over the Last 5 Years

The principal strength of the Institute's funding is the diversity of the revenue streams. This has reduced the Institute's financial reliance on the Government funding of a single programme (the BVSc). Of particular note in this regard is the diversified academic portfolio clustered about the veterinary programme [i.e. BSc (Physiology), BSc (Animal Science), Dip Vet Nursing, BMLS, BApplSc (Agriculture), and BApplSc (Equine)]. Also of importance is the buoyant research and consultancy income and the growing student fee income (principally derived from full-fee-paying veterinary students). In order to continue this diversification of income, without adversely affecting the creative time of staff, the Institute is actively working to develop an animal science/health commercial cluster. Eventually it is hoped that the start-up companies in this commercial cluster will yield dividends that will be passed to the Massey Foundation and thence to the Institute to advance our academic mission – particularly in the priority areas of 'blue-sky' research and teaching innovation.

Another strength is the willingness of the University to cap the money it retains centrally from research and consultancy income at 15% of gross revenue. Thus, the majority of research and consultancy income is made available to the staff members performing the research/consultancy. This provides a strong financial driver for research and gives staff access to discretionary funds to use for academic purposes.

The high degree of autonomy and flexibility for the Institute in the management of its financial affairs is a very significant advantage.

Of particular note is the commitment of Massey University's senior management to ensuring the Veterinary Teaching Hospital remains first and foremost a place of clinical instruction rather than a profit generating arm of the University.

In spite of recent funding increases, the principal weakness of the Institute's revenue remains the comparatively low level of Government support of veterinary education.

3.8 Trends in IVABS Finances During the Last 5 years and Anticipated Future Trends

The financial trends for IVABS over the last 5 years have all been positive. It has been pleasing to see growth in revenue, growth in the investment in the academic programme and the improved contribution which in turn has underpinned much of the re-investment in the IVABS facilities which will be apparent to the site visit team. We expect these positive financial trends to continue and to drive further gains in the veterinary programme at Massey University.

3.9 Recommendations

The comparatively low (to US standards) support by the Government of veterinary education remains of concern. Nevertheless, in a country with a small tax base, it is important to have realistic expectations of the capacity for the Government to increase tertiary education funding. Accordingly, the Institute intends to continue to diversify its income sources to reduce reliance on the Government. Initiatives in this regard include:

- Continued diversification of the teaching programmes leading to an expansion of the taught veterinary postgraduate papers and the introduction of an international extramural teaching programme
- A continued drive to increase research, consultancy and PBRF revenue
- The creation of “spin-off” companies in which the University (IVABS) retains a shareholding; five IVABS-associated spin-off companies are now registered
- Addition of new royalty streams; IVABS currently receives royalties for a small number of products including vaccines, diagnostic aids and software. A successful alliance with a pharmaceutical company is leading to pharmaceutical royalties.
- Increasing revenue from gifts, endowments and sponsorship; New Zealanders are not known for their largesse and the Institute’s revenue from gifts and endowments is correspondingly poor.
- Continued pursuit of alternative sources of Government support including Centres of Research Excellence and Partnerships for Excellence.

Section 4 – Physical Facilities and Equipment

4.1 Narrative Description of Major Facilities

The majority of the physical facilities of the Institute are centrally located on the Turitea Campus of Massey University. This central location provides ready access to a number of University buildings which the veterinary programme shares with other academic programmes (see Appendix 4.1). The Institute also operates from three off-campus sites. These are the Large Animal Teaching Unit, the Jennersmead Research Farm and Estendart Ltd in the Batchelar Laboratory Complex.

The construction style and the building “utilities” are strongly influenced by the temperate climate of Palmerston North. Temperatures range between 10-25° C for the majority of the year and most offices and laboratories have ample windows making for a pleasant working environment with plentiful natural light and good ventilation.

IVABS Building

The IVABS Building is the hub of the veterinary programme and consists of an extensive ground floor (Level 1) and a nine level tower block providing a total of 10,754 m² of floor space. The Level 1 of the building was completed in 1968 (6 years after the establishment of the Veterinary Faculty and 5 years after the first intake of students) and occupies 4912 m². The tower has 5842 m² of floor space. The Veterinary Teaching Hospital floor plans are provided in the Supplements.

Level 1 is primarily devoted to clinical activities (see Veterinary Teaching Hospital below). It includes the entrance ways and foyer, small and large animal hospitals, anaesthesia, surgery and radiology suites, a commercial diagnostic laboratory (see NZVP below), post mortem room, lecture theatres and tutorial rooms, student locker rooms, IVABS Undergraduate Teaching Office, staff offices and the custodial services rooms. An associated new Equine and Farm Services building was built in 2006 adjacent to the main IVABS building. The Hopkirk Research Institute building was also built in 2006 and connects to Level 1 of the IVABS building via a short ‘bridge’.

The anatomy laboratory and associated facilities (including the anatomy museum that incorporates the principal computer-aided learning laboratory) occupy most of Level 2. The anatomy dissection laboratory has a floor area of 265 m² and is equipped with stainless steel tables for dissection, radiograph view boxes, a chiller, freezers, specimen preparation and storage areas. A seminar room and a small number of staff offices complete this level.

Level 3 has the Institute administrative offices including the office of the Institute Head. The Research, Business Development and the Postgraduate Studies offices are sited on this level adjacent to the main area of postgraduate student accommodation. The offices of the Foundation for Veterinary Continuing Education of the New Zealand Veterinary Association (‘VetLearn’) and the New Zealand Veterinary Journal are located on this level. The remainder of the space is occupied by a tutorial room and a staff common room.

Level 4 is devoted to two large teaching laboratories that are required for parasitology, bacteriology, virology, histology and pathology practical classes. These laboratories both

have a floor area of 301 m² and are equipped with ample “wet laboratory” bench space and “dry areas” for microscopy.

Level 5 houses a large physiology teaching laboratory, some offices and workshops for technical staff and postgraduate student accommodation. The physiology laboratory has a floor area of 302 m² and is equipped with “wet laboratory” bench space and “MacLab” computer workstations.

Level 6 is mainly occupied by the offices and research laboratories of the physiology and anatomy staff.

Level 7 houses the offices of the pathology and parasitology staff, a microscope room, histology processing laboratory, parasitology laboratory and a number of research laboratories.

Level 8 is the location of the offices of some of the infectious disease staff along with research laboratories, autoclave and media room. The virology suite includes a “level 2” biocontainment laboratory. A finance administration office is also maintained on this floor.

Level 9 is primarily devoted to building services and storage but includes some laboratory animal holding facilities that are used intermittently.

Large Animal Teaching Unit

The Large Animal Teaching Unit (LATU) is a recently constructed (1993) facility in which most of the large animal teaching practicals are conducted. It is situated approximately 2 kilometres from the IVABS building. LATU is managed by IVABS staff, occupies approximately 2,000m² and sits on 62 hectares (150 acres) of farmland devoted to the teaching animal herds. The LATU facilities include modern roofed yards for handling large animals, stalls for conducting examinations and an arena. The teaching facilities were expanded in 2005 to their current floor area to accommodate the increase in class size. Improvements included doubling the size of a seminar room, addition of a tutorial room and the roofing and installation of walls on 3 sides of the former outdoor stockyards with extensions to them. In addition, the land area farmed by the manager of LATU was increased by 10 hectares to the current land-holding of 62 hectares (155 acres). The increased land area was necessary to support larger teaching herds for the bigger class – thus avoiding an inappropriate increase in the number of teaching procedures endured by each animal.

Hopkirk Research Institute

The construction on this new \$17 million 3000m² joint venture animal health research facility was completed in December 2006. The building contains 6 large, open-plan, level 2-containment laboratories devoted to infectious disease, public health and parasitology research. It has 3 modern Level 3-containment laboratories and state-of-the-art research equipment. As a part of this development, a new combined entrance to the Hopkirk Research Institute and IVABS building and a combined staff common room will be built in 2007. There will also be associated upgrades of small group teaching space and new offices and laboratories for some staff.

Science Towers

The lectures and laboratory classes in physics, chemistry and biochemistry for undergraduate veterinary students are conducted in the Science Towers. These facilities include modern

well-appointed lecture theatres and laboratories. The Science Towers are 100 metres from the IVABS building.

Wool Building

The Wool Building is 500 metres from the IVABS building. It houses the IVABS epidemiology staff, the wool laboratory and the wool teaching facilities. The Institute occupies 282 m² in the Wool Building.

University Computer Facility

IVABS classes requiring large numbers of computers are held in four University computer laboratories. The two main labs are located 100 metres from the IVABS Building in the Science Tower B building.

Equine Parentage and Genetic Services Centre

The Equine Parentage and Genetic Services Centre is housed in a separate building 500 metres from the IVABS building. The building houses the equine genotyping laboratories as well as offices for the IVABS staff who manage the Centre. The building occupies 242 m². The Unit is equipped with a variety of equipment including automated DNA analyzers.

Estendart Ltd

Estendart Ltd is the commercial research arm of IVABS. It leases 500 m² of the Batchelar Complex approximately 1 kilometre from the IVABS Building. This company has laboratory animal research facilities and also manages a research farm (“Jennersmead”) 10 km from Palmerston North. The research farm occupies 18 hectares and includes housing for dogs and sheep, cattle yards and deer handling facilities used in support of the research and teaching programme of the company and Institute.

Small Animal Production Unit

The Small Animal Production Unit (SAPU) is managed by Agricultural Services and is the centralized facility which breeds and houses laboratory animals for University staff. It is 1 kilometre from the IVABS building. Modern surgical facilities for researchers are part of the SAPU complex.

University Farms

Agricultural Services manages 2000 hectares of farmland for the University. The farmland includes dairy farms, sheep and beef farms and a deer research unit. These farms help to underpin the production animal undergraduate and postgraduate teaching and research of the Institute.

University Library

The University Library is 300 metres from the IVABS Building. It contains the library collections for the entire University as well as an extensive collection of veterinary publications.

Non-University Facilities

IVABS contracts a small proportion of its clinical teaching to 4 leading private practices. These practices all operate from excellent quality modern premises in Palmerston North and the Waikato region of New Zealand.

4.2 Adequacy of the Facilities

4.2.1 Classrooms, labs, and computer-aided learning facilities

Lecture Theatres and Tutorial Rooms

The undergraduate veterinary students are taught in a variety of lecture theatres that are managed by the University (Marsden Lecture Theatre, Social Sciences Lecture Theatres, Ag/Hort Lecture Theatres, Ira Cunningham Lecture Theatre (ICLT), and Vet 1 Lecture Theatre) and a number of tutorial rooms managed by the Institute (Vet 2, Vet 3, Vet 4, Vet 6, pathology tutorial room, radiology tutorial room and LATU tutorial rooms). Tutorials and rounds are also held in the Teaching Hospital treatment room, small animal consultation rooms, and in the wards and stables (“walk-through rounds”).

The lecture theatres are of a suitable size to accommodate the full class (size greater than 115 m²) and most tutorial rooms are capable of seating one quarter of the class (size 22-41 m²). All rooms have adequate seating, lighting, angles of view and auditory qualities. All are in a good state of repair. All lecture theatres and most tutorial rooms are equipped with overhead projectors, slide projectors and white-boards. All lecture theatres are equipped for computer-based presentations. Both ICLT and Vet 1 lecture theatres (the 2 main theatres) have been recently refurbished as have many of the tutorial rooms.

The lecture theatres and tutorial rooms are very good, well equipped teaching facilities.

Teaching Laboratories

The laboratory classes in physics, chemistry and biochemistry for undergraduate science students and veterinary students are conducted in the Science Towers in recently renovated, well equipped, teaching laboratories.

The anatomy laboratory classes are held in the Level 2 teaching laboratory (dissection room) in the IVABS Tower. The current dissection room was re-floored and redecorated in 2001 to accommodate the larger class size. Since 1997 animal materials have been discretely transferred between the ground level and dissection room on level 2 in an anatomy-only service lift built onto the tower building.

The microscopy teaching lab on Level 4 (used for teaching practical classes such as histology, haematology, cytology and histopathology) was refurbished in 2002 and new electronic projection facilities added to increase the flexibility of presentation modes to students. The space was reconfigured to accommodate the larger class and new microscopes were purchased. The slide collections have been reviewed and numbers increased to meet larger class needs.

The physiology lab on Level 5 has been refurbished and upgraded in 2002 and 2003 to accommodate two groups of 50 students able to undertake different activities on either side of the room. Sixteen physiological workstations with PCs (500MHz processors) with full internet access are used for traditional physiology practicals. Workstations are networked so they can receive data streams from a single experiment undertaken as a demonstration. Experiments are presented on closed circuit television monitors and a master workstation is projected to assist instruction in how to capture, analyse and interpret the data. In the future, the University plans to move the physiology laboratory to a new College of Sciences undergraduate teaching laboratory complex adjacent to the IVABS building. When this

occurs, the epidemiology staff will be moved from the “Wool Building” into refitted space on Level 5.

Animal handling, clinical and reproduction/obstetrics tutorials and laboratories are held either in the Veterinary Teaching Hospital, the Feline Nutrition Unit or the Large Animal Teaching Unit. A new small animal treatment room with a separable tutorial area was constructed in 2000 to provide more effective teaching space. The Large Animal Teaching Unit (described above) is a modern facility and is one of the strengths of the Institute.

At the time of writing, plans for a new Teaching Wet Lab (principally for surgical teaching) with a capacity for 50 students have been finalised and construction will begin in February 2007. These floor plans will be included in the Supplements.

In summary, all of the teaching laboratories are in a good state of repair and are effective teaching spaces with good lighting and ventilation.

Computer-Aided Learning/Information Technology Group

The 5 staff of the CAL/IT group are housed in a suite of offices on Level 5. These staff answer IT queries, produce teaching videos (including digital format), scan slides, maintain the audiovisual equipment, develop and maintain websites and create computer-based educational material. The audiovisual equipment includes overhead projectors, slide projectors, videoprojectors, computer projectors, cameras (35mm film and digital), videorecorders (35mm film and digital), scanners, WebCT software and computers. The University maintains the University network and provides additional computer support by way of a help-desk and computer consultants.

Collectively these resources are adequate for our current CAL/IT needs and are a strength of the Institute.

Autotutorial/Computer-Aided Learning Rooms

The Institute has four autotutorial/CAL rooms. These facilities are primarily used for computer-aided learning and to provide students ‘cage-side’ access to electronic databases to assist them ‘work up’ their clinical cases. One autotutorial room (Pedigree Pal Lab) is located near the VTH reception ‘wing’, another (Bomac Lab) is near the post mortem room, the third room is in the new Equine Farm Services building and the fourth is on Level 2 in the anatomy museum. The current facilities contain networked computers to access electronic databases, a store of CD-ROMs and, in the case of the Level 2 facility, a number of high quality anatomy autotutorial programmes written and produced by IVABS staff.

These facilities are popular with the students and are a strength of the Institute.

Computer Rooms and Computers

The Institute uses well-equipped and maintained University computer laboratories for large classes requiring computers. Computer-based examinations in some BVSc papers make use of these laboratories. The following four University computer laboratories are available for use by undergraduate students:

STB 1 Laboratory (Room 1.01 of Science Tower B)

This laboratory contains 30 Pentium 4 2.6Ghz (1Gb Ram, 80Gb HDD, CDRW) and 25 G5 Dual 1.8Ghz (1Gb RAM, 160Gb HDD, Superdrive, Apple Studio Screens) workstations.

Operating systems are Windows 2000 and Mac OSX 10.3. The laboratory also contains two HP LaserJet 8150N Printers and two scanners.

STB 2 Laboratory (Room 1.09 of Science Tower B)

This laboratory contains 65 Pentium 4 2.6Ghz (1Gb Ram, 80Gb HDD, CDRW) workstations. Operating system is Windows 2000. The laboratory also contains three HP LaserJet 8150N Printers.

BSC 1 Laboratory (Room 1.08 of Business Studies Central)

This laboratory contains 54 Pentium 4 2.6Ghz (1Gb Ram, 80Gb HDD, CDRW) workstations. Operating system is Windows 2000. The laboratory also contains two HP LaserJet 8150N Printers.

PLB1 Laboratory (Room 1.12 Psychology Building)

This laboratory contains 25 Pentium 4 2.6Ghz (1Gb Ram, 80Gb HDD, CDRW) workstations. Operating system is Windows 2000. The laboratory also contains one HP LaserJet 8150N printer and one scanner.

Undergraduate student access to networked computers for literature searches and word processing is provided in the “Information Commons” (containing 92 Windows-based workstations) which is situated in the University library, the University computer laboratories and the Institute autotutorial rooms (see above). Wireless access is available from the student foyer. Postgraduate students use their own computers or those provided by the Institute in either the postgraduate offices or autotutorial rooms.

The computer facilities and support available to staff and students are generally adequate but the rapid pace with which computer technology advances provides an on-going funding challenge.

4.2.2 Large Animal Teaching Hospital

The Institute has begun a redevelopment programme of the Large Animal Teaching Hospital and associated facilities. The redevelopment is being undertaken in a stepwise manner to preserve operational capability during the redevelopment and to ensure a cost-effective use of resources.

Equine and Farm Services Building and Associated Changes to Vehicular Access

The first phase of the Large Animal Teaching Hospital redevelopment is the construction of a new Equine and Farm Services reception facility in close proximity to the entrance to the Hospital. The new facility includes a combined farm services/equine reception and office area, a tutorial room and computer-aided learning facility for students on farm animal and equine clinical rosters, offices for farm service and equine staff, garages for the ambulatory vehicles, a pharmacy and equipment store and wash-up facilities. In association with this new development, the University intends to alter the vehicular access to the Large Animal Hospital (and post mortem room) by creating a circular drive past the new reception building. The new driveway will enhance our ability to safely load and off-load horses and farm animals.

Animal Holding

The animal holding facilities for the large animal clinical services (equine and production animal) are located on Level 1 of the IVABS Building arranged around a central access way

referred to as the “Breezeway”. The facilities include: 12 equine box stalls, 5 small ruminant pens, an isolation facility, 2 sets of yards, and 10 small paddocks immediately adjacent to the Hospital. Hospitalised patients have year round access to fresh pasture, which is cut and fed in addition to hard feed and hay.

Extensive animal holding facilities for healthy animals to be used in teaching and research projects are also available at the Large Animal Teaching Unit and on the University’s farms.

In general, the animal holding facilities for production animals are adequate given the Institute’s emphasis on its ambulatory service, on-farm teaching and planned animal health teaching. The number of suitable stalls available for horses is occasionally inadequate and we intend to address this in the Large Animal Hospital redevelopment.

Examination/Treatment

The equine examination/treatment area opens off the “Breezeway”. The area contains scales, two standing stocks in close proximity to a work/supply counter, washing facilities, the large animal pharmacy and the tack room. The area is roomy but dated. A new equine treatment room is planned as part of the redevelopment of the Hospital. It will occupy the majority of the space currently used as cattle yards. Equine gait abnormalities are evaluated in the “Breezeway” or in an exterior courtyard in front of the equine stalls.

Minimally handled cattle with clinical problems are managed in a set of yards at the end of the “Breezeway” using chemical restraint as required. The yards are uncovered and are equipped with a chute and head bail. “Aggressive” cattle are coaxed into the chute and head bail for examination and treatment when necessary. These facilities are usually adequate for the small number of such cattle treated “in house”. They are similar to the facilities found on most farms in the country. It is difficult to justify further expense in this area because of the relatively infrequent use of the yards and the importance of showing students how to operate safely in the type of yarding they will encounter after graduation.

Dairy cattle are usually managed in the box stalls. They are halter-trained on arrival and the use of a head bail is usually not required.

Intensive Care

The intensive care of production animal species is rarely required in New Zealand because the animal industry is based around large herds producing competitively-priced food and fibre. As a result, individual animals do not usually have sufficient monetary value to justify the financial outlay of intensive care or even transport to a distant facility. For this reason, IVABS cannot justify a dedicated production animal intensive care facility. On the rare occasion, intensive care of production animal species is required this is undertaken in the regular stalls.

IVABS cares for a small number of neonatal foals and mares every foal season. This is carried out in the mare-foal stalls in the Large Animal Hospital. Post-surgical colic patients are managed in the colic stalls, which are large and equipped for administration of intravenous fluids. Sawdust bedded boxes are available for fracture patients with post-operative casts. The equine intensive care facilities are basic but adequate and again reflect the comparatively low numbers of foal problems and surgical colic cases seen in New Zealand as a result of management practices (outdoor foaling, pasture feeding systems).

Isolation

The current isolation facility for large animal patients consists of a foyer with a footbath, 2 stalls and a storage room. The isolation facility is rarely required for the isolation of clinical patients because large animal infectious diseases, including equine salmonellosis, are less prevalent in New Zealand than in other countries. The predominant use of this facility is for temporary housing of research animals infected with lowly contagious organisms. Waste is removed via the isolation facilities own exit and is disposed of directly at the University's composting plant. The principal drawback of the isolation facility is its proximity to the Large Animal Teaching Hospital. For this reason we are currently building a new isolation facility approximately 300 metres from the Large Animal Hospital.

Medical Records

The large animal services have a file room in the Equine and Farm Services building for the storage of medical records. The client database and financial details are kept on Practice Management Software (RxWorks), which is shared with the small animal service.

Necropsy

The large animal services share necropsy facilities with the small animal service (see below).

Patient Exercise and Treadmill

Horses are exercised in 10 small (0.1 hectare) paddocks adjacent to the IVABS Building. An equine treadmill is situated adjacent to the exercise paddocks. The treadmill is housed in a stand-alone building separate from the large animal hospital.

Pharmacy

The majority of pharmaceuticals are stored in a central pharmacy (see below). Smaller quantities of pharmaceuticals for large animal use are kept in the large animal hospital pharmacy, the farm service (ambulatory) pharmacy and the anaesthetic room. The ambulatory pharmacy is kept locked with access restricted to clinical and nursing staff.

The large animal hospital pharmacy is locked during evening hours but during the day senior students on large animal clinical rosters and clinical staff have access to the pharmacy for the purpose of filling prescriptions for out-patients and hospital patients. Ultimate responsibility for prescriptions rests with individual clinicians. The pharmacies are stocked and managed by the nursing staff who are responsible for removing out-of-date drugs from shelves. The pharmacy space is adequate.

Radiology

The large animal service shares radiology and ultrasound imaging facilities with the small animal service (see below).

In addition, the equine service makes use of a gamma camera facility for lameness diagnosis. The gamma camera is housed in a separate room. The camera is a relatively old model but is equipped with modern software for image analysis and performs well. Horses receiving radionuclides are housed in a set of stalls immediately adjacent to the gamma facility until their radiation levels drop to the required level. Waste from these stalls is left in the stall until completely inactive (10 half lives) and is then disposed of in the University composting area.

The equine service also utilizes a portable CT scanner, primarily for research purposes, and makes heavy use of ultrasonography for orthopaedic, reproductive and internal medicine

diagnosis. At the time of writing we are exploring a joint venture farm animal/equine CT scanning facility to be established in the Large Animal Teaching Hospital.

The production animal services also use a variety of portable ultrasound equipment mainly for reproductive assessments.

Special Diagnostic

Special diagnostic procedures such as endoscopy and ultrasonography are performed in the large animal treatment area (see above). Special diagnostic equipment includes fibreoptic and video endoscopes (Olympus XP10, PCF-1304, GIF-130-3000), electrocardiograph and ultrasound equipment.

Surgical Services

The large animal surgical suite occupies 90 m² and consists of a padded anaesthetic induction/recovery box, a scrub/surgical supply bay, and the surgery. The large animal surgery is in close proximity to the small animal surgery and shares the same sterile supply. A conventional wheeled surgical table (modified Shanks) is used.

Recent renovations of the equine induction/recovery box have been made to improve staff and student safety. These changes include the installation of a swing gate to separate staff and horse during induction and an overhead hoist to assist staff manoeuvre anaesthetised horses onto the surgical table. A second induction/recovery box is available but its use is hampered by the 40 m distance from the operating room.

The anaesthetic equipment includes good monitoring equipment (see above) and a modern large animal anaesthetic machine/ventilator. The surgical equipment is adequate and includes quality videoarthroscopy equipment. Surgical supplies are high quality and almost all disposable.

The large animal surgical facilities are dated but the ventilation system recently has been upgraded at a cost of \$445,000 to the “ultra clean air system”. Hepa filters and heating were installed in 2004 and chilled water for cooling the next year. The surgical facilities are adequate in their current state and allow us to maintain a very low level of post-operative complications. Nevertheless, a key goal of the Large Animal Hospital redevelopment is to relocate and refit the large animal surgery to more modern standards. To do that we need to first relocate the undergraduate surgical teaching functions from the nearby ‘sheep surgery’ to a new facility. This project is likely to be underway by the time the accreditation team arrives. Once this project is completed and the ‘sheep surgery’ is vacated we will be able to relocate the large animal surgery into renovated space in the sheep surgery’ (while retaining the value of our recent investment in ventilation and anaesthesia induction facilities).

Minor surgical procedures on cattle are usually performed standing either in the box stalls, the outside chute and head bail area or the standing stocks in the equine treatment area. On the rare occasions that major abdominal or orthopaedic surgery is required on a large ruminant, it is performed either standing in the equine stocks or in the large animal surgery described above (depending on the condition). Surgery on small ruminants is currently performed in the “sheep surgery” primarily as part of the undergraduate curriculum.

4.2.3 Small Animal Teaching Hospital

The Small Animal Hospital has undergone major alterations and refurbishment since the last AVMA accreditation visit.

Reception/Waiting Area

A new frontage to the Veterinary Teaching Hospital was built in 2002 on University Avenue. The new frontage includes a new reception area, a merchandising area separated from the reception area by a glass and panel wall (to improve the professional appearance of the reception area), a storage area with external access (for delivery of OTC products), toilet facilities and a facility to allow web and multimedia access for the students, particularly conveniently for those on the small animal roster (also behind a glass and panel wall).

Animal Holding

The Small Animal Hospital has 3 general wards occupying 25.4m² each. Ward 1 is devoted to cats. Ward 2 is reserved for canine medical patients. Ward 3 is for small mammals and pet avians. Larger dogs are kept in eight 1.1 x 3 metre runs and three 1.2 x 1.7 metre runs adjacent to the Wards and, if appropriate, spend a period of the day in similar runs outside in the exercise yard.

The wards have seven 100 x 80 cm cages and ten 60 x 55 cm cages arranged in two tiers. The cages are made of concrete lined with a modern resin. Some wards have heated cage floors and all wards are equipped with heat lamps for patient comfort. All wards have stainless steel sinks, hot and cold running water, hand-disinfectant dispensers, shelves for the records of hospitalized patients and extensive storage areas above the top tier of cages.

A wildlife ward was constructed in 2001. This excellent facility is capable of housing high conservation value wildlife. It is an integral component of New Zealand's oiled-wildlife response plan – a plan that is managed by the Institute.

The animal holding facilities are adequate in size for the current caseload.

Examination/Treatment

The Small Animal Hospital has five consultation rooms. Three are of a suitable size (17 m²) for small group teaching. The consultation rooms have a traditional layout with an examination table, supply counter, wall-mounted otoscope/ophthalmoscope, stainless steel wash basin, hand-disinfectant dispenser and chair(s) for clients.

A new small animal treatment room was constructed in 2001. It has 2 rooms to allow separation of clinical tutorials from the bustle of clinical activities. A nurses' station adjoins the treatment room and the neighbouring ICU. The treatment room now provides sufficient space to accommodate the medical treatments, dentistry procedures, minor surgical procedures and tutorials that are conducted in this space. In addition, ventilation has been improved, the waste gas scavenging system has been upgraded and reticulated oxygen installed.

Intensive Care

A new small animal intensive care and post-anaesthetic recovery ward was constructed in early 2001. The 4 by 7 metre ward contains eight cages of 60 cm x 60 cm x 65 cm ; 4 cages of 75 cm x 90 cm x 95 cm; and one cage of 75 cm x 120 cm x 90 cm dimensions. In addition,

the ICU has one run in a corner of the room for the care of very large dogs. The ward is contiguous with a nurses 'station'.

Isolation

A new small animal isolation ward (8.5 m x 4.4 m) has been built. This has been positioned to allow direct access from the consulting rooms via an external door. It has an anteroom (for disinfection procedures, changes of clothes) and the appropriate self-contained examination/treatment facilities, caging and ventilation for what has historically been a relatively low occupancy rate (primarily pups with infectious gastroenteritis).

The ward is suitable for isolating clinical patients with infectious disease but not for bio-containment of exotic organisms.

Medical Records

Medical records are stored in a room off the reception area and when inactive are moved to storage areas in the wards and on the 9th floor. The practice management software (RxWorks) used by the Veterinary Teaching Hospital has not yet been upgraded by the manufacturer to include the security features we require to make student access to electronic records feasible. We are currently in discussion with another veterinary school about the feasibility of purchasing their systems. These discussions are ongoing. As a result there is still a reliance on paper-based clinical records in the Veterinary Teaching Hospital. Medical record space is currently adequate.

Patient Exercise

A concreted open-air secure exercise yard is available for dogs. Dogs are also leash walked in the campus grounds when their temperament allows. Cats requiring long hospitalisation periods are exercised in the feline ward and accommodated in large cages.

Pharmacy

Pharmaceutical stocks are located in a large (39 m²) central pharmacy. Access to this pharmacy is restricted to specific staff whom are provided with electronic key cards. The time and date of the entry of staff using the key cards is electronically recorded. Stocks of controlled drugs are kept securely in two safes in the companion animal pharmacy. Controlled drugs are 'dispensed' to other safes located in the equine treatment room, nurses station, companion animal treatment room, anaesthesia room and large animal ambulatory pharmacy to ensure ready access when required for cases. Access to the stock safe is restricted to one staff member who is responsible for (a) ensuring adequate stocks in the peripheral safes and (b) auditing recording keeping. Controlled drugs are countersigned in and out of the safe. The controlled drug procedures comply with the Misuse of Drugs Act (1975) and include a weekly check of stocks and a full audit every 6 months. Where legislation requires it, the use of controlled drugs is recorded in a register.

Smaller quantities of pharmaceuticals for small animal use are kept in the small animal hospital pharmacy, the treatment room and the anaesthetic room. The pharmacy and anaesthetic rooms are locked during evening hours but during the day clinical staff have access to the pharmacy for the purpose of filling prescriptions for out-patients and hospital patients. From Monday through to Thursday in the mornings a veterinary nurse is situated within the pharmacy to facilitate prescription filling. She also uses this time to help teach veterinary and veterinary nursing students. The ultimate responsibility for the prescriptions rests with individual clinicians.

The pharmacies are stocked and managed by a full-time Purchasing Officer (who is a diploma-qualified veterinary nurse). She is responsible for identifying out-of-date drugs and removing them from the pharmacy. Compliance of pharmacy policy with pharmacy regulations is overseen by a senior lecturer in veterinary pharmacology. Drug ordering and pharmacy protocols are available at all times to all VTH staff on the VTH's intranet site. All but the simplest drug compounding is performed off-site and delivered overnight to the Institute.

The pharmacy facilities and protocols are safe and effective and meet legal requirements.

Radiology

The small animal and large animal services share a large (120 m²) radiology suite located on Level 1 of the IVABS Building. The suite has separate areas for small animal and large animal (predominantly equine) radiography. The radiology suite includes an office, film storage facility and reading room. A dark room with hand-processed film developing facilities (for teaching purposes) and an automated film developer completes the suite. A new tutorial room was constructed during 2005.

The radiology equipment includes the following:

1. A Super 120 CD (150 kV, 140 mA) Philips x-ray tube (used predominantly for large animal radiography),
2. A new (January 2005) Philips BV Libra Mobile IIC-arm mobile image intensifier.
3. A new (June 2005) Philips CS4 x-ray tube (used predominantly for companion animal radiography).
4. A new (June 2005) bucky table (Bucky Diagnost FS).
5. A mobile x-ray unit (Atomscope HF80/15) for field use.

The radiology suite has recently been extensively refurbished, including the steel gantry suspending the x-ray tubes and air conditioning.

Small animal ultrasonographic examinations are generally undertaken in the Diagnostic Room (1.123) with large animal ultrasonographic examinations generally undertaken in the 'sheep surgery' (1.77). The principal ultrasound machine is a Philips HDI 3000. An older ATL model UM9 HDI ESP is used as a back-up. Both machines have colour doppler capability.

The small animal service accesses CT scans and MRIs through a local private radiology group (Broadway Radiology in Palmerston North). This fee-for-service arrangement works well and is more cost-effective at our current caseload than maintaining our own CT and MRI equipment. As mentioned above, an in-house CT-scanner may be available soon.

In general, the diagnostic imaging facilities are adequate.

Special Diagnostic

A small diagnostic room (8.05m²) is available in the small animal hospital for the conduct of endoscopy, electrocardiography and electromyography. The room is well appointed and well lighted and ventilated. The endoscopy equipment is excellent, including video endoscopes (GIF100, VQ8143A); a pediatric gastroscope (XP-10), a video-bronchoscope (BFP160), a urethroscope (URF-P2) and a rigid rhinoscope. Electrodiagnostic equipment is also available for performing insertion potentials and nerve conduction velocities.

A new (August 2006) VetScan biochemistry analyser and new (November 2006) VetScan haematology analyser is available for after hours use. An older Reflotron unit is also available for single analyte biochemistry testing.

The special diagnostic room is adequate for its present use but there are plans to enlarge this space at the same time that CT is introduced in the adjacent space.

Surgical Services

The small animal surgical suite occupies 85 m² and includes an orthopaedic surgery room, a soft tissue surgery room and a scrub bay. Another 2 surgical rooms are used for surgery practical teaching (the “Dog Surgery” and the “Sheep Surgery”), spay classes and for surgical research projects. The “Dog Surgery” is 50 m² and the “Sheep Surgery” 75 m². They are separated by a 16 m² scrub bay. Minor surgical procedures are usually carried out in the small animal treatment room.

Sterile supply is immediately adjacent to the small animal surgical suite and the small animal anaesthetic and surgical preparation room. Together with the small animal anaesthetic room, the sterile supply occupies 100 m². The sterile supply contains facilities for cleaning, wrapping, autoclaving, storing and dispensing surgical equipment and supplies.

The anaesthetic equipment includes good monitoring equipment (pulse oximeters, end-tidal gas analyzers, ECGs, direct and indirect blood pressure monitors, thermistors, nerve stimulators) and support equipment (ventilators, fluid pumps). An adequate number and quality of anaesthetic machines is available for clinical service and surgical practicals.

The surgical equipment and the small animal surgical facilities are adequate for the caseload.

4.2.4 Diagnostic Laboratories

Diagnostic Pathology

A commercial diagnostic laboratory (New Zealand Veterinary Pathology Ltd) commenced operation on Level 1 of the IVABS building in April 2004. This full-service laboratory services most of the diagnostic requirements of the Massey University Teaching Hospital and, in conjunction with another NZVP laboratory in Hamilton, provides diagnostic support to veterinarians throughout the country. Although NZVP employs its own technical staff and pathologists, some IVABS clinical and anatomical pathologists are contracted to NZVP to provide support in the interpretation of laboratory results, cytology and histopathology. This commercial laboratory has replaced the clinical pathology laboratory previously housed on Level 1. Case material is freely available for use as case-studies in undergraduate teaching and postgraduate pathology students receive access to cytology and histopathology cases as part of their training.

Although NZVP is a fully commercial diagnostic laboratory, Massey University is a significant shareholder and is represented on the Board.

Diagnostic microbiology and parasitology generated by the Massey University Teaching Hospital is still serviced by the IVABS laboratories located on Levels 7 and 8 of the IVABS Tower. A histopathology processing laboratory located on Level 7 services the needs of IVABS pathologists and processes histopathology specimens on contract for NZVP.

The parasitology laboratories occupy approximately 81.78m², the microbiology laboratories occupy approximately 110.42m², and the histopathology/histology laboratories occupy approximately 82.5m². These laboratories are equipped to meet the needs of the Hospital and the Institute's research programmes. The pathology microscope room, histopathology tutorial room (containing a multi-headed microscope) and pathology transparency collection are also housed on Level 7.

Necropsy

The small and large animal services share a necropsy facility on Level 1 of the IVABS Building. The necropsy facility is a large facility occupying 191.74m². It has an associated trimming room, storage rooms, chiller, photography room, tutorial room and office space. The trimming room possesses a new fume hood. A hoist has been installed on the necropsy floor to assist the handling of large cadavers and the loading of remains into "wheeled bins". The loaded bins are transported to a commercial biowaste facility for incineration. Video projection to overhead visual display monitors has been utilised to improve student viewing of pathology specimens from 'clean areas' of the necropsy room during the popular weekly pathology "grand rounds". A hydraulic large animal necropsy table has been added to the necropsy room in recent years and networked computers for entry of necropsy data have been installed. A tutorial room adjacent to the necropsy room has also been upgraded and a multi-headed microscope has been installed to demonstrate cytological preparations to students involved in the necropsy roster.

The necropsy room is generally adequate for current needs although we look forward to the opportunity to improve the access of animals and cadavers.

Slaughterhouse Facilities

An abattoir suitable for killing small groups (20-50) of sheep or calves from research projects is available on campus, approximately 2 km from the IVABS building. Individual animals or smaller groups destined for the post-mortem room are either slaughtered in an ante-room adjacent to the post-mortem room or in the sheep pens or cattle yards 10-30 metres away.

4.2.5 Animal Facilities for Teaching and Research

The animal facilities for teaching and research are excellent and include the Large Animal Teaching Unit, the Massey University farms and the Veterinary Teaching Hospital facilities described above.

Animal holding facilities for small ruminant teaching are maintained in the Large Animal Hospital. These consist of pens and an associated area for physical examination of the animals and for preparing them for surgical practicals. Most small ruminant teaching and research is conducted on-farm.

The facilities for equine handling and palpation practicals at the Large Animal Teaching Unit are excellent. Equine clinical teaching facilities are, however, beginning to fall somewhat below the standards of modern equine referral hospital and renovation of the Large Animal Hospital has begun to address these concerns. Most equine research is conducted on leased farmland or in the Large Animal Hospital facilities or Treadmill Building.

The access of the Institute to a variety of University-owned or leased farms for teaching and research is a major strength of the veterinary programme. These farms are described in Appendix 4.2.

An animal holding room is maintained on Level 5 to hold zebra fish, frogs, rabbits or rodents for brief periods prior to physiology teaching practicals.

Small ruminant and laboratory animal research facilities are maintained in the SAPU complex (411m²). These facilities include 10 animal rooms, individual pens for sheep and surgical facilities for instrumenting animals. The animal rooms are temperature and humidity controlled. The species housed at SAPU include rats, mice, hamsters and rabbits.

The Feline Nutrition Unit is managed by the Institute of Food, Nutrition and Human Health. Undergraduate students visit the Unit for animal handling practicals and IVABS staff provides veterinary care of the colony. The companion animal facilities at Jennersmead include a small colony of approximately 20 dogs housed in open-air kennels and runs. The dogs are used primarily for contract nutrition and pharmaceutical research. The whelping facilities at Jennersmead were renovated in 2001. Dogs from the colony are occasionally transported to the IVABS building for use in animal handling and anaesthesia practicals and for non-invasive clinical research.

The construction of the Hopkirk Research Institute required AgResearch (the IVABS partner in the Hopkirk Research Institute) to build a state-of-the-art animal holding facility 1 kilometre from the Massey University Campus. IVABS staff have access to this facility which includes Level 3 containment facilities for laboratory animals and Level 2 containment facilities for sheep and cattle.

In summary, the animal facilities for teaching and research are excellent.

4.2.6 Research facilities and equipment

Research Laboratories

The Institute has research laboratories on the Levels 1 and 6-8 of the IVABS Tower and Level 2 of the Hopkirk Research Institute. These laboratories are predominantly shared by more than one researcher to ensure efficient use of the space and collectively occupy approximately 1500 m².

Institute staff have ready access to a variety of other laboratory space and facilities on other parts of the campus. These include a new electron and confocal microscopy facility (The Manawatu Microscopy Facility) recently established in Science Tower D, a genotyping service, a nutrition laboratory, a DEXA scanner and an NMR unit.

Laboratory bench space within the Institute remains at a premium but as a result of the construction of the Hopkirk Research Institute is currently adequate to meet the needs of the Institute.

The state-of-the-art Hopkirk Research Institute is a strength of the Institute.

4.2.7 Administration and Staff Offices

The offices for administrative staff are located on Levels 1, 3 and 8 and are adequate for the administrative functions of the Institute.

Staff offices are located primarily in the IVABS Building, Hopkirk Research Institute, and the Wool Building with a small number in the Batchelar Complex, Equine Parentage Unit, Jennersmead Farm and Large Animal Teaching Unit. The increasing staff numbers in parallel with the larger class put considerable pressure on office space. This has been alleviated by the construction of the Hopkirk Research Institute and the new Equine Farm Services building.

All staff offices have windows helping to ensure good lighting and ventilation and a pleasant working environment. Air conditioning is not required as a result of New Zealand's temperate climate although has been installed in the Hopkirk Research Institute. However, some offices do not heat well for brief periods in winter and others become too hot in summer. Some of the Level 1 offices are small but remain functional.

New postgraduate student offices have been built on Level 3 of the IVABS Tower and in the Hopkirk Research Institute. Postgraduate students are also housed in a variety of smaller offices in other areas of the IVABS Building and Wool Building.

Overall – office accommodation for staff and postgraduate students is adequate.

4.2.8 Service areas for students

Library

The library is a University facility and is well maintained, lighted and ventilated. Please see Section 6 for a full description of the Library.

Lockers/Lounges

Separate male and female locker rooms are provided on Level 1. Each student is provided with a locker for the storage of protective clothing, bags, books and diagnostic equipment. These facilities meet the needs of the veterinary and veterinary nursing students.

The student lounge is in the foyer of the IVABS building. The lounge occupies 59 m² and has student mail boxes, seating for 56 students and a small number of tables for discussions and for reading. Vending machines are provided for snacks and “sodas”. The student lounge has facilities for making coffee and heating food and has recently been provided with wireless internet services. The very public location of the lounge results in an untidy appearance to the foyer. In the long-term a separate 5th year lounge is desirable.

The Undergraduate Programme Office opens onto the foyer providing a close association between the office responsible for undergraduate student affairs and the student lounge.

A small office on the 8th floor is provided to MUVSA from which the Association conducts its business.

Veterinary students are also encouraged to mingle with other students in the campus facilities made available by the University. These facilities have undergone extensive renovation since the last accreditation visit. They are only a short walk from the IVABS Building and offer a variety of food, café, student support, entertainment and banking services. The temperate

climate means that the campus facilities are accessible to students throughout the year. Most students prefer to take the short breaks between lectures outside in the fresh air. Longer breaks are usually taken in the library, the on-campus cafés, the Recreation Centre or the park-like grounds of the University.

4.2.9 Building Infrastructure, Janitorial services and Waste Disposal

Air handling infrastructure such as fume hoods and air conditioning units (where used) are adequate. The lifts in the IVABS Tower were modernised in 2006 and the electrical supply upgraded.

In general the building infrastructure is adequate although for short periods during mid-Winter and mid-Summer the heating and ventilation, respectively, are inadequate in some rooms.

Maintenance of Buildings and Janitorial Services

The Facilities Management division maintains the buildings occupied by the Institute. The majority of cleaning, security and refurbishment tasks are now contracted by the division to private companies. In general, this out-sourcing has proved effective.

The Facilities Management Division operates a rolling maintenance plan. As a result, the quality of maintenance is variable from area to area. In general, however, the Institute's buildings are maintained in a good state of repair and Facilities Management staff do their best to respond promptly to problems identified by Institute staff. The most recurrent and intractable maintenance problem is leaking of the flat Level 1 roof which intermittently occurs during the occasional torrential downpour.

Waste Management

Biological waste from the necropsy room is placed in bins and transported to a commercial biowaste facility for incineration. Animal material from the dissection room or from physiology is disposed via the necropsy room (as above) or if appropriate (fresh sheep or ox) into specially prepared and fenced offal pits on the Massey farms. This cartage uses a flat bed truck with a fibreglass canopy to ensure that the material is secure and out of the public gaze. Sharp waste (needles, scalpel blades etc) are disposed of through a commercial medical waste service.

4.3 Health and Safety

Health and safety measures include a formal occupational health and safety (OH&S) orientation of the students at the start of each year so they are familiar with the hazards in their 'workplace' and the policies and procedures to minimize risk. This orientation is refreshed at the start of each week for roster groups entering the different areas of the Veterinary Teaching Hospital. Careful attention is paid to all national regulations and external audits are performed.

Cattle sheep and horse handling is taught at LATU to students entering the veterinary programme and all must meet specified requirements at the end of the practicals before they are allowed to progress in the veterinary programme. Standard operating procedures are in place for high-risk exercises such as horse handling and clinical procedures.

A constant effort is made to upgrade facilities to modern standards and to use appropriate protective clothing to reduce risks.

Health & Safety is a standing item on the Agenda of the IVABS Executive committee and the Executive reviews incident reports twice yearly for adverse trends. The Institute employs a Safety Officer who, along with the Technical Services Committee, is responsible for oversight of University workplace safety policies, hazard identification, accident reports, safety workshops and recommendations on improvements to current practices. Each staff member's accountability statement includes a paragraph clearly stating they must act to minimize risks to the safety of staff and students. Each laboratory manager is responsible for safety in their laboratory, including storing chemicals and material data sheets correctly. Training of staff and postgraduate students using dangerous equipment (e.g. the band-saw) is carefully carried out by their supervisors with written standard operating procedures being required.

4.4 Current Plans for Improvement of Buildings

The Institute is continuing on its phased major capital works programme. The programme began in 1999 and aimed at remedying existing deficiencies and preparing for the expanded veterinary class and faculty.

Redevelopment of the Large Animal Teaching Hospital and the surgical teaching facilities of the Veterinary Teaching Hospital has begun. Several of these projects (large animal isolation, undergraduate surgical facility) will be on-going during the next accreditation visit. Prior to the 2014 accreditation visit we expect to have completed the redevelopment of the Large Animal Teaching Hospital according in most respects to the Master Plan provided in the Supplements. Included in this programme will be upgrades to the post mortem room. We also plan to digitalize the diagnostic imaging suite in the very near future and are hopeful of soon having access to an in-house CT-scanner.

A new faculty entrance will also be under construction in early 2007 as part of an upgraded shared entrance for staff of IVABS and the Hopkirk Research Institute.

Later in 2007, a new ground floor common room for staff of IVABS (clinical and non-clinical) and the Hopkirk Research Institute is due to be built. All other IVABS common rooms are to be closed to ensure that all veterinary and animal science staff from throughout the organisation have the opportunity to get together on a daily basis in order to promote collegiality.

A new College of Sciences centralised wet-laboratory complex will be built in 2007 adjacent to the IVABS building into which the functions of a number of the current teaching laboratories in the College will be consolidated. The physiology, laboratories of IVABS will be affected by this change freeing up approximately 400m² of new space for re-development within the IVABS Tower in to which we plan to move the EpiCentre staff.

The refit of the Veterinary Tower has begun with the upgrades of infrastructure (lifts and electrical supply). Minor capital works in the Tower will occur in 2007 as a result of the reallocation of space vacated by the movement of some staff to the Hopkirk Research Institute and the consolidation of the common rooms.

4.5 Equipment – general comments

A list of the current equipment assets valued at greater than \$10,000 is provided in the Supplements.

The Institute purchases major items of equipment using two main funding routes: the University's annual major capital equipment round from which IVABS attracts on average approximately \$250,000 per annum and from external research initiatives. Items valued at less than \$20,000 are prioritised for purchase in two competitive equipment funding rounds held within IVABS. Alternatively these minor capital items are purchased from research accounts, consultancy income or clinical income.

The equipment available to IVABS staff for teaching, research and clinical services is in general adequate.

4.6 Recommendations

The facilities available for the veterinary programme at Massey University enable the Institute to meet the objectives of our undergraduate teaching, research and postgraduate programmes and our clinical activities.

The expenditure to date on the Institute's facilities has allowed us to satisfactorily remedy the concerns identified in previous accreditation visits and to make many other improvements.

The principal areas where additional improvements will be made over the next few years are highlighted in Section 4.4. These improvements are scheduled as a component of the major capital works programme of the University. The most pressing of these is the redevelopment of the Large Animal Hospital.

We wish to acknowledge that to date the University has been very supportive in ensuring that IVABS capital works projects are high priorities among the many competing capital development programmes of the University. We have no reason to believe this commitment will change.

Appendix 4.1 Campus Map

[illegible]

Appendix 4.2 – Massey University Farms

- Deer Research Unit - this Unit is used almost exclusively by IVABS staff and consists of covered yards for handling deer along with indoor teaching and research facilities both of which were built in 2006. The land area of the unit is 26 hectares adjacent to campus. It is intensively sub-divided and farms approximately 200 deer. This farm is designed primarily for grazing and management studies.
- No. 1 Dairy Farm – A milk supply unit and part of the original farmland at Massey Agricultural College purchased in 1928. It comprises 120 hectares of pasture and 4 hectares of forestry. There are 300 Holstein Friesian cows milked on the farm. The objective of this farm is to explore winter milk production and to provide farming “systems” demonstrations and associated teaching, research and extension.
- No. 4 Dairy Farm – This is a seasonal supply dairy unit owned and supervised by the University since 1973. It comprises 180 hectares of pasture and 12.5 hectares of forestry. There are 500 Friesian cows milked on the farm. The objective of this farm is to operate as a profitable seasonal supply dairy farm exploring the opportunity and problems relating to increased technical and economic efficiency. The farm also provides facilities for teaching and research associated with seasonal dairying. The wide range of research includes automatic detection of oestrus in the large herd, and effluent disposal on the heavy soils.
- Dairy Cattle Research Unit – (No 3 Dairy) - This is a seasonal supply dairy unit owned and supervised by the University since the 1960s. It comprises 42 hectares, with about 100 cows, mainly Holstein Friesian, but changing to Jersey cross breeds. Its main purpose is to provide facilities for detailed dairy research, which has included wintering methods on the heavy soils, studies of cow with high or low genetic merit, the feeding value of different pasture cultivars, magnesium metabolism in cows, once daily milking and studies of cows selected for heavy or light body weight. Currently it is studying two systems of dairy production, one farmed using conventional methods and the other farming organically.
- Tuapaka Sheep and Beef Farm – This is a high country sheep and beef cattle property 10 kilometres east of the Palmerston North Campus, farmed by the University since 1938. The farm now operates as two separate units with a heifer and 2-tooth ewe operation on the flats. The Hill Unit comprises 315 hectares of grazing and 35 hectares of forestry and the Flat Unit comprises 97 hectares of grazing and 6.5 hectares of forestry. The objective of the Hill Unit is to explore management systems relevant to hill country agriculture and assist with teaching and research related to this topic. The objective of the Flat Unit is to examine the opportunities for mating ewe lambs at 7-8 months of age and heifers at 15 months of age and the influence of early mating on production.
- Riverside Farm (Wairarapa) – This is a sheep and beef cattle property in the Wairarapa. Massey University has taken responsibility for farm policy and the day-to-day running of the property since 1978. It comprises 475 hectares of flat land and 248 hectares of hill country. The objective of Riverside Farm is to assist the University to accumulate, expand and disseminate knowledge about dry-land farming. IVABS constructed a field laboratory at Riverside in 2001.
- Keeble Farm – This is a “North Island” sheep and beef “finishing unit” used for teaching, research and extension purposes. It was purchased by Massey University in March 1978. It comprises 240 hectares of grazing, 8 hectares of forestry and 14 hectares of native bush. The objective of Keeble Farm is to undertake research studies on sheep and beef cattle nutrition, new systems for meat production, reproductive performance, sheep selection and various aspects of animal health, behaviour and welfare.

Section 5 – Clinical Resources

5.1 The Veterinary Teaching Hospital (VTH)

Introduction

The majority of the clinical instruction at Massey University is provided by a 'traditional' veterinary teaching hospital. This reflects the faculty's view that the first tentative steps of veterinary students into clinical medicine should be in a nurturing, student-focussed environment with a good supply of case material including first-opinion cases.

The VTH operates as a separate "budget unit" but in all other respects is an integral part of the Institute. Careful steps have been taken to avoid any tangible barriers between the VTH and the Institute in order to ensure that the goals of the VTH and Institute remain in harmony. For example, the Director of the VTH reports directly to the Head of the Institute and all academic staff involved in clinical service are employees of IVABS rather than the VTH. Furthermore, the mission statement³ of the VTH nominates the provision of clinical education and scholarly opportunities - not generation of revenue – as its role. These principles are embodied in the "Veterinary Teaching Hospital Agreement" between IVABS and the University (provided in the Supplements).

The clinical services in which IVABS staff participate are small animal, production animal, equine, laboratory diagnostic services, nursing and wildlife. The clinical services draw on staff in a variety of different (Human Resource) Management Groups. These include the Centre for Companion Animal Health, Massey Equine, Pathobiology, Infectious Diseases and Public Health, Clinical Technical Services and Pastoral Livestock.

The clinical services are overseen by Service Chiefs whose primary responsibility is to ensure the efficient running of a clinical service. As described previously, Service Chiefs meet monthly in a forum referred to as the Clinical Services Management Committee chaired by the VTH Director.

Financial Support of the VTH

The Institute transfers \$140,000 per annum to support the direct costs of clinical teaching in the VTH. In addition, the majority of the clinical staff salaries are met from the University's GL (block) grant to the Institute amounting to support of approximately \$2.6 million per annum. The VTH sets the prices of some of its clinical services at slightly below the current commercial rates. This is primarily done for certain procedures considered of high teaching merit (such as pregnancy testing of cattle, RSPCA spays and neuters, and horse castrations). However, for ethical, financial and professional leadership reasons, most VTH services are not discounted below the prices of neighbouring practices.

Individual clinical staff are given the right to discount services "for teaching" through a mechanism known as the Clinicians Discretionary Fund. The fund (\$3000 per annum per FTE clinician) was set in place to provide clinicians the capacity to discount cases which have significant teaching or academic merit.

³ VTH Vision, Mission, Values are as follows: Vision: *To be a world-leading Veterinary Teaching Hospital.* Mission: *To provide outstanding education through clinical services and advancement of knowledge in an excellent environment.* Values: *Integrity, Excellence, Caring, Community, Sustainability and Innovation.*

5.2 Number and Type of Patients

The number of patients cared for by the VTH and Herd Health Programmes are provided in the Tables in Appendix 5.1. Case load trends have been generally positive.

Small Animal Service

Small animal cases are derived from four main sources:

- Primary accession material, derived from the VTH and through Central CityVets (who provide a contracted externship for 5th Year students)
- Referral cases, including medical and surgical cases referred to the VTH and ophthalmic cases referred to Central CityVets
- Cases derived from animal shelters/charities and pounds in Palmerston North
- Cases seen during the 12 weeks of extramural studies that students undertake in Years 3-5 of the programme.

The small animal caseload in the VTH has been held at steady levels despite a decline in pet ownership in New Zealand over recent years. Nevertheless, the total small animal case load remains modest compared to that of veterinary schools based in large urban areas. This is partly a reflection of the school's provincial location. It is also due in part to the Hospital's policy of limited receiving hours. This policy is somewhat inconvenient to clients but has the distinct advantage of allowing staff to devote time to demonstrating or assisting students with diagnostic procedures and maximising the value of the day's clinical material (see below). More recently, the VTH has appointed two Community Veterinarians in part to provide more flexibility to clients requiring early afternoon appointments. Needless to say, emergencies are seen whenever they arise, 24 hours a day.

Ninety percent of the small animal patients are first-opinion cases and 10% are referrals from veterinarians predominantly in the lower North Island. On a day-to-day basis, the sixteen students rostered on to small animal medicine, surgery and anaesthesia can expect to deal with approximately 20 new patients, of which 2 are referrals and with 19 hospitalised patients. This ratio of first opinion to second opinion cases provides many routine presentations that are of great value to the training of "entry-level" veterinarians and a steady stream of more complicated cases to stretch the students' diagnostic capabilities.

The VTH has a formal agreement to spay and neuter cats on behalf of the Manawatu RSPCA and currently is negotiating with the Palmerston North City Council and Manawatu District Council on a dog desexing arrangement.

The educational value of the case material is maximized by interactive clinical rounds, "talk-and-chalk" tutorials to develop deeper understanding of the cases seen each day and group demonstrations of interesting abnormalities detected by physical examination of hospitalized patients. This group approach is of particular importance to ensure all students get exposure to "pocket pets", pet birds and wildlife the accessions of which are relatively low.

All students undertake a minimum of 7 weeks in the small animal hospital/externships in Year 5; those who choose a Small Animal Track increase this figure by 9 weeks.

Equine Service

Equine case material is provided through:

- The Equine referral service of the VTH
- Primary accession material derived through the VTH, including dentistry, castrations and general medicine
- A contracted externship with Matamata Veterinary Services
- The teaching herd of horses maintained at LATU, Massey University
- The 12 weeks spent in extramural studies in Years 3-5 of the programme

It is recognised that students' experience with horses before entering veterinary school ranges from extensive to negligible. Hence, the aim of the programme is to expose students to handling, managing and performing clinical procedures on horses, in circumstances that allow even diffident students to develop confidence with them. A herd of teaching horses (30 mares, 2 stallions) is maintained at LATU for teaching students entry-level handling skills and, later on in the programme, to ensure that they can perform basic equine clinical skills (ranging from removing shoes to nasogastric tubing) at a satisfactory level of competence. This "in house" exposure to horses is reinforced by a requirement to undertake 3 weeks practical work with horses (at an equine stable, breeding farm and/or farrier) in the first 3 years of the programme. Students are required to pass tests in horse handling and/or clinical examination (Years 1 and 3, respectively) before undertaking required farm or clinical work with horses in vacation times because of the potential risks involved with working with horses.

The equine VTH service is predominantly a referral service, drawing cases from over the entire lower North Island and the Waikato (the core of New Zealand's racing and stud-breeding industries). Case numbers were adversely affected by the recent opening of a new equine surgical facility in a neighbouring practice and by the general move of the thoroughbred industry northward to the Waikato region of New Zealand. The Massey Equine group has responded to this challenge by an enhanced promotional campaign to local horse owners and referring veterinarians, as well as by the termination of its long-standing referral-only policy. More focus has been placed on obtaining cases from the Wellington region, where there are few experienced equine veterinarians. The success of this campaign is evidenced by the increase in equine case numbers over the last two years but particularly in the last 12 months.

A first opinion (non-ambulatory) equine service is now offered and is generating small, but increasing, numbers of equine cases of value to the teaching programme.

In addition, the equine service provides the routine health care and reproductive management of the equine teaching herd (30 mares and 2 stallions). Procedures include care of feet, management of foot abscesses, dentistry, suturing of lacerations, reproductive examinations, worming, vaccinations and other herd health care. These animals are also used throughout the programme for teaching students routine procedures (e.g. injection techniques, passing nasogastric tubes in Years 3-5), handling (Years 1-3) and clinical examination (Years 3 and 4).

An "in-house" equine castration service is offered. Clients are encouraged (by competitive pricing) to transport colts to the VTH for castration. This allows this procedure to be taught in a more controlled environment (with professional anaesthesia support) than can be achieved during "in-field" castrations. The VTH is actively promoting an equine dentistry service and has invested in specialised dental equipment. Weekly dental clinics are held at the VTH.

The contracted externship at Matamata Veterinary Services provides students with interest in equine practice exposure to additional material that includes stud medicine, racing and medical and surgical cases. Students who choose the 5th Year Equine Track spend 3 weeks at this externship; other students (who do not choose this track) are selected to spend 1 week at the externship based on their performance and interest in Equine Studies in Year 4.

All students spend 2 weeks in the VTH Equine service in Year 5 and all students spend a third week either at Matamata Veterinary Services or in the VTH (as described above). Students who choose a Mixed track spend one further week in equine studies, whilst those who choose an Equine track, spend a further 9 weeks with horses.

Ambulatory (Production Animal) Service

Production animal case load is provided through:

- The “Farm Service Clinic” of the VTH, whose main function is to provide primary accession services to local dairy herds
- Animal Health and Sheep and Beef rosters, which provide primary accession (e.g. service testing of bulls) and referral (e.g. parasite resistance problems), services to dairy, sheep, beef and deer herds/flocks; together with exposure to pig herds
- Contracted externships with two mixed (predominantly farm-animal) practices in the Waikato region of New Zealand: Veterinary Enterprises, Te Awamutu and Animal Health Centre, Morrinsville
- The 12 weeks spent in extramural studies in Years 3-5 of the programme
- The 2 weeks spent in the spring (August) of Year 4 undertaking extramural study in dairy practices (to provide them with experience in obstetrics and peri-partum disorders of dairy cows)

The ambulatory service of the VTH provides a first-line ambulatory veterinary service to about 60 dairy farms (15,000 cows), 25 sheep and beef farms (40,000 sheep and 3,000 cattle, respectively) and 2 deer farms (500 deer). The sheep, beef and deer farms are predominantly serviced by staff teaching the clinical rosters that underpin the herd/flock programmes of the Veterinary Teaching Hospital (see section 5.3 below). The dairy work, both individual animal and herd investigations, is predominantly handled by the “Farm Service” clinicians. These clinicians also contribute to the planned dairy health programmes along with staff teaching the Animal Health roster (see below).

On a yearly basis the Farm Service clinicians carry out approximately the following number of procedures on dairy cattle:

- pregnancy diagnosis (8,500)
- NVOs (no visible oestrus) (1050)
- “herd profiling” ie. Liver biopsies and blood sampling for assessing macro- and micro-mineral status; 30 herds plus (10-15 cows per herd).
- calvings (55), plus fetotomy (55) and c-section (10)
- metabolic problems (80)
- sick cow investigations (450) including mastitis, endometritis, ketosis, abdominal problems (LDA, RDA, caecal dilation etc.), respiratory problems, cardiovascular problems (endocarditis, TRP, etc.), facial eczema
- lameness (275)
- abortion investigations (15)
- ill-thrift/parasitism investigations (10)

- herd health visits (50)
- various surgical procedures (100) including eye ablation, third eyelid removal, dehorning, bloat stab wound repair, claw amputation/arthrodesis, abdominal surgery etc.

In recent years, the caseload of the Farm Service clinic has been modestly increasing. Various steps have been undertaken to ensure the caseload is adequate for educational purposes. These include a significant expansion of the case-based tutorial time (to gain better educational value from each clinical case), successful changes led by the current Farm Service Chief to improve the competitiveness of the practice and its 'service ethic', an expansion of the Herd Health programme, introduction of a free transport service to bring sick cattle to the VTH, and the introduction of a rebate scheme and a "patrons' seminar day" for farmers making a significant contribution to our teaching programme.

To supplement the cases seen through Massey's ambulatory clinic, contracted externships have been set up with two, large, multi-centre clinics in the Waikato region. These practices, work predominantly with production animals (mainly dairy) and have very substantial case loads. These take students at busy times of year (i.e. autumn, when herds are being pregnancy tested and dried off; and spring, when herds are calving). The cases seen by students at these practices are mainly primary accessions, that are augmented by herd health visits and tutorials in production animal/preventative medicine practice on each day of the externship.

5.3 Herd and Flock Health Programmes

The Herd and Flock Health programmes conducted by the Institute occur in the fifth year of the curriculum. The programme is compulsory for all students as part of the core rosters but students who follow mixed or production animal tracks undertake a more extensive programme. Herd and flock health are primarily taught by way of two clinical rosters (the "Animal Health roster" and the "Sheep and Beef roster") aspects of which are conducted during different seasons to ensure the seasonality of the farming system is understood by the students. The Herd and Flock health programmes are described in Appendix 5.2.

5.4 Practical Work and Extramural Requirements

As described in Section 10, the clinical training that students receive at the VTH in their 5th year is augmented by extramural; practical work requirements. The farm practical work includes at least 4 weeks on a commercial sheep farm, 4 weeks on a commercial dairy farm and 3 weeks of equine stable, stud or farrier work and up to 3 weeks work in piggeries, poultry units, zoos or other livestock units. Clinical extramural study ('seeing practice) in the 3rd and 4th year must include at least 6 weeks supervised practical experience in not less than two veterinary practices one of which must be a large animal/rural New Zealand practice. Extramural study in the clinical rosters must include two weeks dairy practice during the spring of Year 4 and seven weeks supervised practical experience in not less than two veterinary practices during 5th year (one of which must be a large animal/rural New Zealand practice). The numbers of patients seen by each student during their veterinary practical work are not recorded.

5.5 Contracted Teaching Practices (Externships)

The Institute has successfully used contracted teaching practices over the last three years to augment the clinical training provided by the VTH. These experiences have been very well received by the students.

Four leading veterinary practices have been selected to be part of this programme.

- Animal Health Centre – a leading rural practice in Morrinsville, Waikato [<http://www.ahc.co.nz>]
- Central CityVets – a large small animal practice in Palmerston North
- Matamata Veterinary Services – a leading equine practice in Matamata, Waikato
- Veterinary Enterprises – a leading rural practice in Te Awamutu, Waikato [<http://www.vetent.co.nz/profile.htm>]

Animal Health Centre, Veterinary Enterprises and Matamata Veterinary Services are established practices with a long history of excellence in their fields. Central CityVets was created by the IVABS-brokered merger of three local practices into a single modern high quality, 7-day-a-week, general practice based in central Palmerston North. The creation of Central CityVets was seen as the most effective way to provide students in Palmerston North with additional access to primary accession cases whilst avoiding head-on competition with our professional colleagues.

Our goals in developing the contracted teaching programme were to:

- improve the number and variety of first-opinion companion animal, equine and production animal clinical cases available for veterinary student learning
- increase the exposure of veterinary students to leading rural private practices to help inspire students about rural veterinary careers
- increase the influence of leading practitioners on student learning to demonstrate the high standards that can be achieved in private practice and to educate the students in the practical realities of day-to-day practice

Students spend up to 2 weeks at each practice in numbers ranging from one to five students at any one time. The responsibilities of all parties (students, University and practice) are clarified in a written contract. The provisions of the contract include the agreed learning outcomes, supervision, assessment and financial arrangements. A standard teaching contract will be available to the site team in the supplemental documents available on site.

The adequacy of the education provided at the practices is reviewed through student feedback surveys and focus groups. Suggestions for improvement are fed back to the practices at meetings. Meetings to debrief the preceding teaching period and to plan for the forthcoming period are held once or twice a year with each practice. These meetings may include structured sessions on teaching-skill development.

5.6 Patient Load in Relation to the Number of Patients of Each Species Necessary for Adequate Clinical Instruction

The VTH has access to ample production animal clinical resources. As mentioned above, the emphasis of the production animal teaching is on herd rather than individual animal medicine since this reflects the nature of farm animal practice in New Zealand. In order to ensure undergraduate students have sufficient skills in the management of individual large animals, the ambulatory service staff utilize problem-based tutorials and offer a free transport service to bring sick cattle into the VTH for diagnosis and necropsy by undergraduate students. This has increased the numbers of sick cattle hospitalised but these numbers remain low. In addition, the 4th year vacation periods have been altered to ensure the August vacation of these students coincides with spring calving. This allows the students to undertake practical work with rural practices during their busy season and ensures an intensive 2 week period of hands-on-clinical experience with obstetrical, mastitis, metabolic and perinatal problems. These steps are supplemented by the contracted teaching experiences described above.

While the provincial location in Palmerston North has been advantageous for the teaching of production animal veterinary science, it constrains the development of the companion animal practice. Nevertheless, the current case load is more than adequate to keep the students in the small animal rosters busy yet allows time (on most days) for in-depth interactive group discussions of the clinical material seen that day. Debate on why particular diagnostic tests and therapies were chosen is entered into helping to instil critical thinking skills. The small animal case material seen during the VTH clinical rosters builds on that observed during 4th year clinical tutorials and is supplemented by the cases observed during the weeks spent in private practice externships. In addition, a variety of other arrangements are utilized to increase clinical exposure including undertaking the health care of the Best Friend Feline Unit and the Palmerston North City Council aviary along with the Central CityVet roster mentioned in the Contracted Teaching section above. In combination, these mechanisms provide excellent entry-level small animal clinical knowledge and acceptable technical competency.

The equine clinical resources are currently considered adequate. Nevertheless, the caseload is vulnerable because of our distance from the principal equine region of New Zealand (the Waikato). This has led us to supplement first opinion and referral equine cases via the contracted teaching arrangement with Matamata Veterinary Services. Other initiatives to secure our equine caseload have been the establishment of an equestrian facility on campus for horse-owning students attending the University, re-investment in our equine facilities, recruitment of new service-orientated clinical staff, exploration of equine joint ventures with neighbouring practices in the Lower North Island and the successful \$10M Equine Partnership for Excellence programme. The latter is a government-private sector-university research and education partnership which has allowed us to increase staff numbers, send Massey staff for specialist equine training programmes overseas, invite leading equine professors from overseas universities to contribute to the equine programme at Massey University, and invest (up to \$250,000 pa) via a newly established Equine Trust in innovative equine and teaching and research initiatives. Marketing activities have also increased through annual attendance at the New Zealand Horse of the Year show.

The numbers of wildlife cases seen at Massey University are now adequate for our teaching purposes. This is a result of the establishment of the New Zealand Wildlife Health Centre and Wildlife Ward as part of a successful bid to the Maritime Safety Authority (MSA) to manage

marine oiled wildlife disasters. Sponsorship by Shell New Zealand assists us meet the cost of treatment and good relationships with the Department of Conservation assures a steady stream of high conservation value wildlife to the Ward. The wildlife caseload is principally avian which has augmented the small numbers of pet birds seen at the VTH.

The clinical staff have, in association with the profession, defined (in general terms) the entry level technical competency standards expected of new graduates. These standards are listed in the Practical Work Handbook and serve to focus the attention of academic staff, practitioners and students on ensuring these minimum skills are acquired either during the student's VTH training or their externships.

In summary, expanding the available clinical resources in proportion to the increased class size was achieved by the variety of mechanisms described above along with changes to the curriculum. The latter included extension of the final year of clinical instruction from 28 weeks to a full year of instruction to make use of all of the VTH's caseload, and introduction of greater clinical experience in the junior years of the curriculum (see Curriculum Section). As a result, all students now achieve a superior clinical education to that achieved previously.

In conclusion, we believe the patient load in each species is adequate for clinical instruction.

5.7 Medical Records

The VTH maintains a comprehensive set of medical records for all species. Core patient and client data and financial information are computerised using a practice management system (RxWorks software). The practice management system is hospital-wide with all data stored on a central server. RxWorks functions adequately for billing, inventory management and financial reporting. Case records are recorded manually by students and staff and linked to the practice management system by case numbers so retrieval of case material is straight-forward. The standard problem-orientated medical record system is used to facilitate student learning. Diagnoses are manually coded to facilitate retrieval of patient records for research purposes. A part-time medical archivist has recently been appointed to assist reception staff with the task of maintaining the medical records and voice recognition software is under trial to help staff reduce the time demands of referral letters.

The VTH's dependence on paper-based case records remains under regular review but as yet we are not satisfied any cost-effective, proprietary, locally-supported, veterinary software packages provide sufficient medical record security to be implemented in a teaching hospital environment. As previously mentioned, we are currently in discussion with a US veterinary school about the feasibility of purchasing their 'home grown' patient management software.

5.8 Recommendations

The VTH has been successful in maintaining the delicate balance between its service, scholarship and teaching functions and IVABS is privileged to have access to a diverse range of small animal, equine and production animal clinical resources at a single location. We are satisfied that we have increased the clinical resources available to the Massey University veterinary students sufficiently to meet the needs of the expanded class and to provide students with opportunities to achieve a higher level of competency in routine clinical procedures than previously.

The access to high quality pastoral production animal systems at our doorstep is a notable strength of the Massey University veterinary programme. We intend to continue to reinforce this strength in the future because of the importance of pastoral agriculture to New Zealand economy and because this is a particular strength we can offer the international veterinary community.

As mentioned previously, we are committed to the traditional veterinary teaching hospital model of 'experience plus reflection' as the best way to provide a professional clinical education. For this reason we will continue to actively develop and promote the VTH and its services in order to ensure its continued success. The strategies we have adopted in this regard include:

- regular client and staff satisfaction surveys (each client receives a feedback form and 'results' are available on our Intranet site).
- expanding, in a cost-effective and strategic manner, the range of clinical services offered to support teaching and scholarship
- adding selected advanced clinical techniques that secure the role of the VTH as a national referral centre
- utilizing the juxtaposition of agricultural and veterinary scientists to offer high quality, value-added consultancy services to farm clients
- Patrons' Day seminars to veterinarians and farmers who provide clinical resources to the VTH
- staged improvement of VTH facilities
- improved cost-effectiveness through continual improvement of business practices
- targeted advertising to appropriate market segments

We are also exploring a joint venture with a Wellington practice (similar to that with Central CityVets) along with an agreement with the Wellington RSPCA (similar to that with the Palmerston North RSPCA). The educational goal of these Wellington initiatives is to increase student exposure to companion animal emergency medicine and intensive care cases, and to spay/neuter programmes. The business goal is to minimise the risk of a competing specialist practice opening in the Wellington region that may reduce the VTH referral case load.

We are also considering another teaching contract with a local equine/mixed animal practice to further increase student exposure to first opinion equine cases. Two equine specialty practice joint ventures are being considered, one in the Waikato and one in the Wairarapa, with a view to building the equine referral case load.

Finally, the Institute is privileged to have a sympathetic University administration which regards the Teaching Hospital to be an academic unit rather than a revenue-generating enterprise. This favourable situation will require continued justification to University authorities.

Appendix 5.1

Table A. Veterinary Teaching Hospital Patient Data^a

Table 1

	2000	2002	2003	2004	2005	2006 ^b
Bovine						
New Accessions	17	24	27	34	41	50
Hospitalisations	4	24	27	34	41	50
Hospital days	20	41	40	48	66	114
Canine						
New Accessions	2600	2956	3184	3205	2947	3029
Hospitalisations	1087	358	383	441	474	568
Hospital days	3264	1396	1494	1720	1859	2153
Caprine						
New Accessions	5	2	0	0	2	2
Hospitalisations	4	2	0	0	2	2
Hospital days	12	5	0	0	4	16
Equine						
New Accessions		387	411	248	375	474
Hospitalisations		139	134	113	119	137
Hospital days		1195	1152	972	1058	1142
Feline						
New Accessions	1613	1940	1961	1992	1723	1717
Hospitalisations	389	112	89	131	143	243
Hospital days	1168	336	267	393	442	557
Ovine						
New Accessions	12	4	2	0	6	2
Hospitalisations	7	4	2	0	6	2
Hospital days	21	8	9	0	53	2
Porcine						
New Accessions	6	0	0	0	0	3
Hospitalisations	6	0	0	0	0	3
Hospital days	6	0	0	0	0	9
Cage Birds						
New Accessions	24	133	208	226	177	112
Hospitalisations ^c	2	24	21	48	36	47
Hospital days	4	96	84	192	145	220
Cage Pet Mammals						
New Accessions	40	93	77	127	110	87
Hospitalisations	15	^c	^c	^c	^c	^c
Hospital days	30	^c	^c	^c	^c	^c
Avian Wildlife						
New Accessions	5	70	146	196	138	158
Hospitalisations	5	43	72	145	81	100
Hospital days	25	173	613	1990	1136	1100
Other (non-avian wildlife)						
New Accessions		4	5	7	10	20
Hospitalisations		1	3	4	5	13
Hospital days		3	28	54	65	585

^a Estimates are provided for some species if formal records were unavailable.

^b Annualised data from the first 9 months of the year.

^c Cage Pet Mammals and Cage Birds have the same hospitalisation code so these are combined figures for both subheadings.

Table B. Ambulatory/Field Service Program^a

	2000	2002	2003	2004	2005	2006
Dairy						
Number of Farm (site) calls	961	1049	918	914	1195	1114
Number of animals Examined/Treated	12,328	10,328	11,860	13,200	12,817	13,999
Caprine						
Number of Farm (site) calls	32	3	3	10	10	7
Number of animals Examined/Treated	38	3	3	19	10	8
Equine						
Number of Farm (site) calls			Not	offered		
Number of animals Examined/Treated			Not	offered		
Ovine						
Number of Farm (site) calls	4	2	6	2	5	7
Number of animals Examined/Treated	8	11	24	11	16	24
Beef						
Number of Farm (site) calls	24	2	12	4	5	4
Number of animals Examined/Treated	135	9	20	9	21	8
Porcine						
Number of Farm (site) calls	6	4	4	4	4	4
Number of animals Examined/Treated	33	100	100	100	100	100
Poultry						
Number of Farm (site) calls			Not	offered		
Number of animals Examined/Treated			Not	offered		
Deer						
Number of Farm (site) calls	11	23	19	12	2	9
Number of animals Examined/Treated	250	426	392	190	108	241

^a Estimates are provided for some species if formal records were unavailable.

Table C. Herd/Flock Program Serviced by Veterinary Teaching Hospital^a

	2000	2002	2003	2004	2005	2006
Dairy						
Number of Herds/Flocks/Lots	35	42	46	51	49	50
Number of Animals per Herd	250	250	260	260	265	270
Number of Animals	8750	10,500	11,960	13,260	12,985	13,500
Beef Feedlots						
Number of Herds/Flocks/Lots	0	0	0	0	0	0
Number of Animals per Herd	0	0	0	0	0	0
Number of Animals	0	0	0	0	0	0
Equine						
Number of Herds/Flocks/Lots	2	0	0	0	0	0
Number of Animals per Herd	48	0	0	0	0	0
Number of Animals	96	0	0	0	0	0
Cow-calf						
Number of Herds/Flocks/Lots	0	0	0	0	1	2
Number of Animals per Herd	0	0	0	0	200	200
Number of Animals	0	0	0	0	200	400
Sheep and Beef Cattle						
Number of Herds/Flocks/Lots	29	36	62	48	42	63
Sheep per Flock	1700	700	630	700	550	550
Beef per Herd	120	120	120	140	140	140
Number of Sheep	50,000	9,800	10,100	6,500	2,750	7,700
Number of beef Cattle	3400	2,640	5,550	4,680	5,180	6,860
Porcine						
Number of Herds/Flocks/Lots	12	5	5	5	5	5
Number of Animals per Herd	200-1000	1,000	1,000	1,000	1,000	1,000
Number of Animals	10,000	5,000	5,000	5,000	5,000	5,000
Poultry						
Number of Herds/Flocks/Lots	0	0	0	0	0	0
Number of Animals per Herd	0	0	0	0	0	0
Number of Animals	0	0	0	0	0	0
Fish						
Number of Herds/Flocks/Lots	50	0	0	0	0	0
Number of Animals per Herd	60,000	0	0	0	0	0
Number of Animals	3,000,000	0	0	0	0	0
Deer						
Number of Herds/Flocks/Lots	4	2	2	2	1	1
Number of Animals per Herd	250	250	250	250	280	300
Number of Animals	1,000	500	500	500	280	300

^a Estimates are provided for some species if formal records were unavailable.

Table D. Non-Institutional Sites for Clinical Instruction

Hospital	Duration of Rotation (weeks)	Surgical & Medical facilities	Necropsy	Imaging	Diagnostic Support Services	Isolation	Intensive or Critical Care	Reference materials	Medical Records
Central CityVets	1	Yes		Yes	No		No		Yes

Veterinary Enterprises	1	Yes		Yes	No		No		Yes
Animal Health Centre	1	Yes		Yes	Yes		No		Yes
Matamata Veterinary Services	1	Yes		Yes	No		No		Yes

Appendix 5.2

Animal Health Roster

The Animal Health roster has the following components:

Rotation 1: Core

- Introductory session (Interactive tutorial):
 - Trends in the global marketplace for farm produce, farming and veterinary practice in New Zealand of relevance to veterinary services and skills required by rural veterinarians into the future
 - Concepts and principles of delivery of herd/production medicine services focusing particularly on the human interface, farmer oriented service, farmer learning, education and skill
- Information access and retrieval
 - Hands-on interactive session providing skills in information access, retrieval, quality interpretation and use.
- Dairy herd health and production management
 - A morning visit to a commercial dairy farm (note: an individual farm is used for each roster group). These farms have large herds. The on-farm visit examines current management issues as they arise, eg: feed budgeting, mastitis control, mating, planning, calving planning etc.
 - The following morning the students have a tutorial session in the computer laboratory where students have access to the computerised records and dataset that relates to the farm they have visited the previous day. They work through reproductive records, mastitis control, culling decisions, animal health etc.
- Parasitology (Interactive tutorial)
 - Refinement of knowledge of the parasites of most significance in veterinary medicine in New Zealand and their epidemiology, treatment, management and control
- Reproductive management programmes
 - Interactive tutorial with deer as a model, using basic knowledge of livestock reproduction. Developing skills of observation, problem solving and synthesis by applying that knowledge to practical situations
 - Developing the concept of year-round deer herd reproduction practices and outcomes. Measurement of reproductive performance in a deer herd. Methodology for investigation of reproductive failure.

- Pricing and costing (Interactive tutorial)
 - Discussion of issues surrounding pricing and costing of veterinary fees for services, products and goods to farmer clients
- Porcine production and medicine
 - Commercial pig farm walk-through, necropsies as available, feeding and management within the production cycle, reproduction and artificial insemination, pig restraint and blood collection.
- Cattle reproduction
 - Undertaken at LATU. Students practice and demonstrate their capability in uterine and cervical palpation, pregnancy diagnosis, intrauterine catheterisation etc.

Rotation 2: Mixed and Production Animal Tracks

- Deer herd health and management:
 - A visit to a commercial deer farm with approx. 450 red deer. Discussion with the owner about farming goals, aims and objectives.
 - A walk of the property to examine pasture height and mass, feed quality, animal condition, environmental factors etc.
 - Two exercises are set from this farm visit:
 - performing a partial feed budget for one aspect of the property.
 - identification of the animal health risks to the farmer's goals, aims and objectives and development of risk management strategies for each of those animal health risks.
 - A session is scheduled later in the week for students to present and discuss their recommendations.
- Deer tuberculosis/Johne's Disease diagnosis, control and epidemiology tutorial.
- Deer Herd Profile presentation
 - Students are given a detailed farm and herd data template to complete on a commercial deer farm of their choice (undertaken during personal study or externship time). The farmer's goals, objectives, management and health practices and data are analysed, subjected to scrutiny and criticism, and recommendations developed
 - A presentation is given to the student group, followed by comments, questions and constructive criticism of the analysis and recommendations.
- Cattle reproduction:
 - Advanced level training that builds on experience from the Core AH rotation mentioned above
- Dairy herd medicine
 - Advanced level training building on the previous session in the Core AH rotation above
- Pig medicine (Interactive tutorial)
 - Analysis of pig herd production and health records, disease, feeding and reproductive management programmes to achieve optimum pig production.

Sheep and Beef Roster

The Sheep and Beef roster is taken by all students on the Mixed and Production Animal tracks, once during the Autumn and once during the Spring. During the teaching year, the Sheep and Beef roster involves 2 veterinary staff members and groups of 8 final year veterinary students. The roster routinely services 25 commercial sheep and beef farms comprising approximate 40,000 sheep and 3,000 cattle. Nine of these farms are involved with ram breeding and sell a total of 3,500 rams each year. A further 20 to 30 commercial and lifestyle farms are serviced on a less frequent basis. In addition, students provide the feet care, semen sampling and palpation of a flock of 40 rams held at LATU. Emphasis in this roster is placed on whole flock or herd health. Students are encouraged to communicate with clients and show initiative in solving problems and also to work cooperatively within the group.

Farm visits involve one or both staff members and the roster group of students for that week when undertaking on-farm activities such as pregnancy testing of beef cows; bull breeding soundness examinations; ram soundness examinations, blood sampling and *B. ovis* accreditation; liver biopsy; ram vasectomies; vaccination of sheep and cattle; and flock/herd health investigations.

Students are also involved in practical aspects of research trials, in particular trace element supplementation trials, reproduction trials, and the development of flock/herd health investigations on the properties of VTH clients and the clients of referring veterinarians. An emphasis is placed on the clinical approach to flock/herd problems, collection of data and the writing of reports to clients.

In addition to these farm visits, every roster group has the following compulsory tutorials which are conducted using case material derived from farm visits:

- investigation and control of trace element deficiencies in ruminants
- gastrointestinal parasitism investigations, monitoring for anthelmintic resistance, development of herd/flock parasite management programmes
- breeding soundness examination in the ram; *Brucella ovis* pathogenesis and eradication programmes
- clinical approach to farm herd/flock health problems
- beef cattle reproductive management
- ovine lameness diagnosis, treatment and prevention; foot pairing practical

Aspects of the large animal surgical training are also incorporated in the Sheep and Beef roster. For example, the following practical sessions are conducted at LATU:

- all students perform a vasectomy on a ram lamb
- large animal surgery practical #1 using cadavers including surgical site preparation, ring block, suture patterns, corneal nerve block, dehorning, sub-conjunctival injection, 3rd eyelid local anaesthesia, 3rd eyelid flap, 3rd eyelid removal, surgical treatment of entropion, local anaesthesia of the orbit, eye enucleation, positioning of penrose drains, repair of umbilical hernia.
- Large animal surgery practical #2 using cadavers including surgical site preparation and local anaesthesia, liver biopsy, rumen torcarization, inverted L block, paravertebral anaesthesia, line block, epidural, left flank laparotomy, caesarean section, rumenotomy, left displaced abomasal replacement and fixation, right flank laparotomy, caecal dilatation and volvulus operation, urinary bladder catheterisation, digital amputation and bandaging.

Further to the above tutorial and surgery sessions, students in the sheep and beef special topic course spend an additional two weeks studying in more depth agronomy and soil science, parasitology, trace element deficiencies, flock fertility, farm business management, farm consultancy and design of flock and herd health programmes.

Section 6 - Library and Learning Resources

6.1 Introduction

From the time Massey University was created out of Massey Agricultural College in the early 1960's there has been a single Library on the Palmerston North campus serving all academic units and the pressure to create specialist Libraries has been strongly resisted by both Library and university administrators. This has resulted in a collection in which specifically veterinary materials stand alongside those of related subjects in the life sciences, agriculture, chemistry and physics. From a more pragmatic viewpoint it allows veterinary students longer opening hours and better facilities than might have been available in a smaller unit. The Library is at most a two or three minute walk from the Veterinary Science Building so there is little barrier to its use by veterinary students.

Webpages

- Library Homepage:
<http://library.massey.ac.nz/>
- Veterinary Science Page:
<http://library.massey.ac.nz/findit/subjectguides/veterinarymedicine/veterinarymedicine.htm>
This is the gateway to many of the Library's veterinary resources.

Library Budget (2006)

	Current Budget	
Personnel	\$4,559,000	
Periodicals	\$4,817,000 (print and online)	
Acquisitions	Print	Non-Print
	\$2,638,000	Not separated
Source(s) of Funds	Centrally funded	

Library Personnel (2006)

TITLE	Full Time Equivalent
Librarians	49.9
Library Technicians, Assistants and Support Staff	53.7

6.2 Study Facilities

For a total student population in Palmerston North of approximately 9,500 there are 965 study seats in the Library. Even at the busiest times of the year (immediately preceding examinations) there is space for all students to be seated.

The Library is open for a total of 92 hours per week during the semester. This figure includes 46 hours outside standard working hours, which is valuable for veterinary students who have heavy commitments during the "working week".

The Library also has an Information Commons - an area of around 100 computers offering full access to all Library and University resources. As well as this, a wireless network is available to students and staff with their own computers. Almost all the Library's electronic resources are available to off-campus users who can access them using their Massey login.

6.3 Acquisitions

The Library has been moving from print to electronic periodicals, while continuing to expand the total number of titles covered:

Year	2006	2005	2004	2003	2002
Volumes Held	980,000	960,600	924,900	986,000	853,000
Current Periodicals	4,608 Print 43,636 Online	4,767 Print 33,389 Online	6,637 Print 24,059 Online	7,525 Print 10,088 Online	7,628 Print 7,232 Online
Acquisitions Budget	\$7,455,000	\$7,110,300	\$8,128,300	\$6,980,186	\$7,369,556
Total Budget	\$12,684,000	\$12,765,213	\$13,610,337	\$12,341,120	\$12,332,220

6.4 Collections – Statistics and Assessment of Adequacy

Books

Veterinarians make extensive use of the Library's collections across the life sciences. Massey University does not have a medical school, but it does carry out teaching and research in a number of medically related disciplines, including: nursing, nutrition studies, medical laboratory science, public health, and sports science. By mid-2006 the Library held a total of around 30,000 titles in the veterinary, life and medical sciences that are directly relevant to veterinarians. Of these about 4,000 (or 14%) are published in the year 2000 or later. These titles have a median publication date of 1985. This total can be broken down further as shown in the table below:

Book Holdings (mid 2006)

Dewey Call No.	No. Titles	Post 2000-	Median Date	Exclusions
636.*089... Vet Science	2,567	571 (22%)	1989	253 theses
636 other Animal Science	2,877	353 (12%)	1986	411 theses
615-617+ Medicine	6,201	1,030 (17%)	1989	114 theses 616.8...books ⁺⁺
570-599 Life Sciences	17,581	2,190 (12%)	1983	633 theses
Totals	29,344	4,172 (14%)	1985	1,411 theses

⁺ This callmark range covers only those parts of medicine most relevant to veterinary sciences – namely: pharmacology, bacteriology, virology, epidemiology, parasitology, immunology and surgery

⁺⁺ Excludes books classified at 616.8*, which deal largely with psychology and psychiatry

In order to compare this collection with one of known excellence, a keyword search was done of the catalogue of the University of California Davis on: veterinar?. There are 1,071 book titles returned dating from 2000 to the present held by UCD. The veterinar* keyword search on Massey's catalogue returns 632 (around 60%) for the same period. As Davis's holdings of conference proceedings, theses and report literature are particularly extensive, the fact that

Massey holds 40% fewer titles should not be a matter of concern – especially given the fact publications of this type are increasingly available via the internet.

Journals

The Library also has extensive holdings in the life, medical and animal/veterinary sciences, with at total of 2,440 currently accessible titles of high relevance to veterinarians. This can be broken down as follows:

Current Periodical Holdings (2006)

Dewey Callmark	Print Only	Electronic	Total
636 (Vet/Animal Science)	127	107 (46%)	234
615-617 ⁺ (Medicine)	158	1,114 (88%)	1,272
570-599 (Life Sciences)	65	854 (93%)	919
General Science Titles ⁺⁺			15
Totals	350	2075 (86%)	2,440

⁺ This callmark range covers only those parts of medicine most relevant to veterinary sciences – namely: pharmacology, bacteriology, virology, epidemiology, parasitology, immunology and surgery. Excludes titles classified at 616.8*, which deal largely with psychology and psychiatry

⁺⁺ This allows for general interest science titles, such as: *Nature*, *Science*, *Scientific American*, etc.

Notable electronic journal collections include: Elsevier's ScienceDirect; Wiley InterScience; Blackwell's Synergy; JSTOR; etc. Electronic journals are accessible to all students and staff, both on and off-campus. At present 129 core titles can be found under the Veterinary Medicine Electronic Journals subject heading on the Library's catalogue.

Journal Citation Reports ranks journals in various subject categories according to the number of times articles in the journals are cited. This can give a measure of the adequacy of coverage of core Veterinary titles. Of the top 20 cited veterinary journals in JCR 2005, Massey Library has 19 (95%). Of the top 50 it has 44 (88%).

Another useful way of assessing a journal collection is to ask whether it provides the documents that the Library's users find in the course of their database searches. Three searches were carried out on "typical" subjects in the CAB database with the following results (in each case search results were limited to journal articles in the English language):

Topic Search	No. articles	No. at Massey	% Available
lameness and horse*	1,744	1,601	92%
Leptospirosis and sheep	246	178	73%
thyroid* and hormone* and poultry	641	514	80%

It was notable in each search that large numbers of hits were clustered in a relatively small number of journals. All of these journals were subscribed to. Holdings are extensive, often dating back to the 1960s, or to the first issue.

6.5 Databases

Massey Library provides the major databases relevant to veterinary science –

- Biological Abstracts (BIOSIS)
- CAB Abstracts
- Medline
- SciFinder Scholar
- Web of Science

Medline and Biological Abstracts are mounted through the OVID system while CAB and Web of Science are mounted through ISI. Both give a high level of search functionality and ease of use. Nearly all of these are available over the web.

6.6 Services to Students

Reference Services

The Information Desk is staffed by professional Librarians until 8.00pm weekdays (until 6pm Friday) and for approximately 12 hours at the weekend. It is situated in the Library's Information Commons. Much of the work involves advising students on the use of the Commons and other Library resources. For inquiries requiring a greater depth of knowledge, there are two specialist Liaison Librarians assigned to the College of Sciences.

Training

All 100 level (first year) veterinary students receive a full lecture plus a 60 minute tailored hands-on workshop on information sources and skills. The workshop included a discussion of basic search techniques and an exercise using veterinary examples. It is presented jointly by the Information Services and College Liaison Librarians for the Sciences who are present throughout to assist the students. This is followed by a more advanced class for 200 level (second year) students. These sessions aim to ensure that students possess appropriate information skills as they advance their degree. As well as these dedicated course-integrated sessions, the Library also offers teaching on referencing with its generic Endnote course.

Other Support

Most new postgraduate students in the College of Sciences participate in a series of seminars on research techniques, provided by the College of Sciences Liaison Librarians. In addition to this, students can also access an on-demand Research Consultation service.

6.7 Conclusion

The Library's veterinary science collection is aimed at supporting a substantial research and teaching programme. This is supported by the Library's services and technological infrastructure to maximise the effective use of these resources. It currently meets the needs of the undergraduate and postgraduate veterinary science students. The Library regularly monitors demand on the collection to identify areas where students are requesting more materials than can be supplied. Veterinary science has never fallen within this category.

Section 7 - Students

7.1 Student Enrolments for the Last Five Years

A. Veterinary Science Programme Enrolments

Class	2002	2003	2004	2005	2006
First-year	86	97	98	100	102
Second-year	71	88	93	95	95
Third-year	71	73	91	90	98
Fourth-year	69	70	68	85	87
Fifth-year	73	69	70	63	90
Graduated ^a	67	73	68	66	59

^a Data shown in the “Graduated” row of figures is derived from May graduation handbooks. It is the total of the students graduating in May ceremonies plus students who have graduated “in Council” since the last May graduation ceremony.

There has been a gradual increase in BVSc enrolments over the last few years, partly as a result of the Government allowing a modest increase in the cap on New Zealand resident veterinary students (approximately 5 more students permitted per class) and partly as a result of a decision to open enrolments to full-fee paying students (predominantly from overseas) in 2002. As the larger classes have progressed through the years the total enrolment in the BVSc has increased. The full-fee paying programme is capped at 24 students per year. This is consistent with University policy which seeks to preserve a New Zealand educational experience for foreign nationals choosing to study in this country and to manage the financial risk resulting from potential fluctuations in overseas enrolments. Staff have gone to great lengths to ensure that the number of veterinary students is maintained at a level consistent with the physical, financial, clinical and human resources available to educate them. Staff numbers and clinical resources have been expanded in proportion to the larger class size and significant investment has gone into expanding and enhancing facilities. Many staff have experience of teaching in universities in Australia, Britain and North America which is helpful for the overseas students.

B. Interns, Residents and Assistant Lecturers

Group	# Interns	# Residents	# Residents-MS	# Assistant Lecturers-PhD
Companion Animal	1	1	0	0
Massey Equine	2	0	0	0
Pathobiology	0	0	3	0
Wildlife	0	0	2	0
Anatomy	0	0	0	1

The number of junior staff (interns, residents and assistant lecturers) has remained low during the period since the last accreditation visit. The principal reason for this is financial (with most of our new resources going into expanding the number of ‘core’ faculty positions) but also concern at the very limited employment opportunities available for specialist clinicians in New Zealand.

C. Graduate Student Enrolments

Academic Year	MS ^a			PhD			Other		
	Total	Minority	%Min	Total	Minority	%Min	Total	Minority	%Min
2006	50	15	30%	51	16	31%	42	1	2%
2005	76	20	26%	51	13	25%	38	2	5%
2004	76	16	21%	56	18	32%	16	0	
2003	66	14	21%	48	15	31%	8	0	
2002	54	11	20%	47	14	30%	11	0	

^a Includes MSc, MVSc and MVS

The number of graduate student enrolments has been relatively stable over the last 5 years with the exception of some growth in the Postgraduate Diploma enrolments as a forerunner to the MVM distance-education masters programme (included in the “other” column in Table C). We are expecting postgraduate student numbers to increase in the future as a result of the larger faculty size, the Hopkirk Research Institute, the introduction of a 1-year option to the MVSc (previously a minimum-2 year programme), growth in the new distance education professional development masters programme (MVM), and a number of overseas student recruitment exercises.

D. Enrolments in Other Educational Programmes Taught by IVABS

Year	Activities			
	ECFVG	Foreign Seniors ^a	Veterinary Nursing ^b	Undergraduate Programmes ^b
2006	0	1	40.5	185.6
2005	0	5	42.1	184.7
2004	0	5	39.6	169.0
2003	0	5	43.5	140.7
2002	0	5	38.6	147.8

- Measured as head count – estimate of average number in years 2002-5
- Measured as Equivalent Full Time Students

IVABS staff make contributions to a number of other University teaching programmes including the BSc (Animal Science), BSc (Physiology), B.Appl.Sc (Agriculture), B.Appl.Sc (Equine), Bachelor of Medical Laboratory Science, Diploma in Veterinary Nursing and Diploma in Agriculture. Enrolments in the veterinary nursing programme are capped but enrolments in the other undergraduate programmes have increased by about 25% over the last 5 years. The percentage of IVABS students who are *not* enrolled in the veterinary programme has declined slightly over the period from 41% to 38%.

7.2 Support Services

Advice and Mentorship

The College of Sciences and the University's central administration provide full information to prospective veterinary students and advise individuals on the necessary prerequisites required for them to enter the programme. This advising is initially undertaken in the University's Central Enrolment and Information Sections. The academic office of the College of Sciences through the Programme Administrator for the Veterinary Science Programme provides more specific and individual advice when required, supported by the Assistant Programme Director (Admissions) for the Veterinary Programme. Unusual enquiries are

referred to the Programme Director, Veterinary Science. A full set of written literature available on the internet informs students of the process for selection and what the Veterinary Programme entails.

A mentoring programme is available to the students within the programme through which each student is assigned to a staff mentor. Students are also encouraged to individually approach staff that they feel are able to advise them. A system is in place where year co-ordinators are charged with responsibility to review the performance of students in order to identify those with potential problems in academic performance. When the year or paper coordinators identify such students, they contact them to discuss areas of concern. The students then are advised on how to deal with the concerns.

Student Organisations and Clubs

The Massey University Veterinary Students' Association (MUVSA)

This association is the major voice of the veterinary students. It has an executive that is traditionally elected from the 4th year of the 5-year degree programme, plus the immediate past-president. The executive includes an elected President, a secretary, treasurer, health and safety coordinator and bookshop manager. There are also elected representatives from all course years. This association has representation on many programme committees including the Staff-Student Liaison Committee, the Veterinary Programme Strategic Advisory Committee and the Veterinary Programme Management Advisory Committee.

MUVSA organises social and academic functions and provides a means of students voicing their ideas, suggestions and complaints. There is the opportunity to do this at any time, but the Staff-Student Liaison Committee provides a formal opportunity for this to occur and helps to maintain the information flow between the students and staff of the veterinary programme. The association also provides input on the allocation of some scholarships where peer recognition is a criterion for their award.

The activities of MUVSA are aided by support from the BVSc Programme Director's Office staff. This includes mail sorting and collection, the provision of stationery and limited secretarial assistance.

Many veterinary students also belong to a variety of sporting and cultural clubs administered by the Massey University Students Association.

Student Chapters of the NZVA Special Interest Branches

Students are encouraged to form student chapters of the special interest branches of the NZVA. Current branches exist in Companion Animals, Dairy Cattle, Equine, Wildlife and Sheep and Beef. These branches arrange meetings that occur generally in the evenings and involve the presentation of a talk of interest to the students by an experienced member of the profession. More recently, a student intensive care chapter has been established under the guidance of a staff member.

Counselling Services

Student Counselling Service

The Student Counselling Service is available to all students while they are at Massey University. The Service provides assistance to students who have personal or family concerns, or psychological problems that impact on their studies. In addition to offering individual, couple and group counselling, they provide short courses and workshops. Their workshops target areas like motivation and managing stress and anxiety.

They also offer to students or their friends who have been involved in a traumatic event (such as an accident) debriefing to help them cope with the situation. They have books and pamphlets on a variety of topics of interest to students (e.g. Managing Stress, Anxiety, Depression, Alcohol and Drinking, Marijuana, Being Assertive, Conflict Resolution, etc). There are also relaxation tapes available and a safe room for students to spend time if they are distressed and need a place to sort themselves out.

The service operates on an appointment basis. Currently, all internal students can use the services. Counselling staff try to see students within one week of an appointment being made and if the matter is urgent they do their best to see them immediately. They generally offer students a maximum of ten sessions per year. In exceptional circumstances this policy is reviewed.

Staff from this service provide a series of lectures and workshops as part of the personal and professional development stream of the BVSc so are known to students and therefore are eminently approachable if advice or counselling are required.

Counsellors also provide Impaired Performance and Aegrotat assessments for tests and exams.

All issues discussed with the service are treated confidentially in line with their ethical codes and the Privacy Act (1993).

Alternative Counselling Services

Counselling services are also available through private providers in Palmerston North and through the Palmerston North Hospital. The New Zealand Veterinary Association also provides a "Vets in Stress" Counselling service through the Doctor's Health Advisory Service - a national programme. Students in all year classes are told of the availability of this service to them, in addition to the other programmes.

Financial Advice

Advice from a financial adviser is arranged for the newly selected students. This aims to impress on them the consequences of irresponsible or poorly planned student loan arrangements. This is arranged by the New Zealand Veterinary Association and is facilitated by the Programme Director's Office.

Self-Care in the Curriculum

Being able to look after one's own well-being is a key outcome of the revamped veterinary curriculum. Lectures from a clinical psychologist now form part of the core veterinary curriculum. A learning program of life skills and self care commences for students after their selection into the professional phase of the BVSc. Appendix 7.1 lists the topics covered in

Life Skills/Self Care components of the curriculum, the year they occur and what course in the technical curriculum they are associated with. Every effort has been made to integrate the self-care topics with relevant sections of the curriculum but a perfect fit is not always possible. As mentioned above, many of these sessions are conducted by staff of the student counselling service who welcome the opportunity to provide this assistance to veterinary students.

Placement of Graduates

The BVSc Programme Office maintains a notice board where advertisements of employment opportunities are placed for senior students to view. This service is well known to members of the veterinary profession who forward information about vacancies for listing. The Programme Office also arranges interview times and venues for those veterinary practices that wish to interview interested candidates for positions.

The IVABS Business Development Manager meets with senior students to review their curriculum vitae and to advise them about suitable employment opportunities that match the student's personality, capabilities and career aspirations. This role requires a good knowledge of the prospective employer and the student to help ensure a successful 'match'. Advice often continues through the early employment period.

Other activities that assist with employment opportunities are the placement of students for required periods of practical experience and the contracted teaching arrangements where many who fit in well with the operations and management of the practice receive direct offers of employment.

Students are also encouraged to take up student membership of the New Zealand Veterinary Association. As a benefit of this membership they receive issues of the New Zealand Veterinary Journal and also Vetscript, the newsletter of the association that contains virtually all advertisements for veterinary positions in New Zealand. Staff also provide many students with access to advertisements from other countries (especially Australia) if they seek them and many are posted on the 'jobs notice board'.

7.3 Testing and Grading System

Student grades in the BVSc degree are based on merit and a passing level of performance is gained when basic outcomes for a paper are met. To this extent the outcomes in each paper are criterion based. Beyond this, the distribution of grades follow guidelines that have been proposed for the BVSc degree and approved by the appropriate College committees. For the professional phase of the BVSc the guidelines are for 5% A+ grades, 20% A and A-, 45% B+, B & B- and 30% C+ and C among all passing students. Guidelines recommend that within the A, B and C bands, grades are split into approximately equal width. Generally a mark of 50% is the pass mark but in some subjects a mark of 60% is required to pass. The criteria for grading is communicated to students in paper outlines if they are different from these standard guidelines, as is the nature and weighting of assessment components.

The student attrition rate after admission is minimal (usually 0-1 per year). Very few students have any problem coping with the academic rigor of the course after selection into the professional phase of the programme. This is likely due to the selection pressure applied to gain entry. The causes of student attrition generally relate to personal or family circumstances

making studies difficult. Some students make the decision that a career as a veterinarian is not really what they want after all, but they are very few in number.

7.4 Student Information and Advertisements

Course information and advertising materials are clear and up-to-date. Examples of information brochures on the veterinary programme will be available as supplementary documents to the site visit team. The principal electronic information resource for prospective veterinary students is the ‘veterinary school’ website <http://vet-school.massey.ac.nz> . Information is also found on the university website at http://study.massey.ac.nz/massey/students/studymassey/programme.cfm?prog_id=92611.

Student orientation materials will be provided in the supplemental documents for the review of the site visit team.

7.5 Other Education Programmes

Graduate Programmes

The principal graduate programmes available to New Zealand and overseas students are the research degrees (PhD and MVSc), a ‘taught masters’ principally in epidemiology (the MVS) and the recently introduced MVM aimed at distance-education continuing professional development (CPD) for veterinarians in employment. It is through the latter degree and traditional CPD short courses and conferences that we support the life-long learning of our graduates.

The masters and PhD dissertations are subjected to external examination.

Many junior staff and postgraduate students contributing to or participating in the clinical veterinary programmes undertake study toward certification in veterinary specialties. Several such individuals have gone on to qualify under the AVMA, Australian College of Veterinary Scientists and Royal College of Veterinary Surgeons umbrellas as specialists in anaesthesiology, theriogenology, small and large animal surgery, internal medicine, nutrition and radiology.

Undergraduate Degree Programmes in Addition to the BVSc

As mentioned in Section 7.1, IVABS staff contribute to a number of undergraduate programmes beside the BVSc. These include the BSc (Animal Science), BSc (Physiology), B.Appl.Sc (Agriculture), B.Appl.Sc (Equine), Bachelor of Medical Laboratory Science, Diploma in Veterinary Nursing, and Diploma in Agriculture.

Overseas Graduates (In lieu of the ECFVG Process)

IVABS staff manage the practical examination of the New Zealand National Veterinary Examination. This tests pathology, surgical, medical, and public health knowledge covering the species as well as professional knowledge.

Previously there has been no training available for overseas graduates to achieve required standards. More recently, where room has been available in undergraduate classes, places have been made available to overseas graduates in the third year of the programme. To qualify, overseas graduates are allowed to sit the 2nd year examinations as challenge

examinations. Where they pass these, such candidates can proceed from third year to obtain a Massey University BVSc degree.

Foreign Seniors

Small numbers of senior veterinary students from other veterinary schools (mainly European) visit IVABS during the summer period and are offered the opportunity to see practice in the Veterinary Teaching Hospital.

Distance Learning & Continuing Professional Development

Veterinary faculty members offer distance learning opportunities in subjects such as canine behaviour to non-veterinarians through the extramural programme of Massey University.

Staff also provide CPD through VetLearn of the New Zealand Veterinary Association. In this role, Massey University staff are frequent presenters at continuing education meetings around the country. Staff also are involved in professional meetings and educational programmes on most continents. Visiting veterinarians are provided with tuition when they seek it to assist them to develop clinical skills or the confidence to change their veterinary endeavours. Some desire assistance to return to the workforce after a break. Training programmes are also arranged at the request of the Veterinary Council of New Zealand for remedial tuition of a few veterinarians showing professional inadequacies.

A programme of Veterinary Practitioners in Residence is operated to provide mutual benefits to students and practitioners wishing to further develop their skills. Companies sponsor this programme in the companion animal, sheep and dairy fields with additional financial support from the Foundation for Continuing Education and the special interest branches of NZVA.

Veterinary Nurse Education

Massey University became involved in educating Veterinary Nurses in 1997 in order to raise the standard of veterinary nurse and technician training in New Zealand. The nursing programme is of 2-years duration and leads to a Diploma in Veterinary Nursing.

Up to 30 candidates may be enrolled into the first year of the Dip Vet Nursing and 20 may proceed to the second year of the programme. The provision of lectures and clinical training has placed additional teaching demands on staff but has helped cultivate mutual respect between the new members of the veterinary and veterinary nursing professions and positively contributed to the availability of competent assistance in the VTH.

7.6 System used to collect student suggestion, comment and complaint

Student suggestion, comment and complaint are collected by several means. The Staff Student Liaison Committee is a forum for students to provide feedback on programmes and their operation. Students can bring concerns to their class representatives for transmission to the paper or year coordinators or to the Programme Director or can make direct representations if they so wish.

Student opinion on papers (courses) is obtained using the SECAT (Student Evaluation of Course Administration and Teaching) instrument that is used and standardised throughout the university. Other devices are used where appropriate such as Small Group Instructional Diagnosis (SGID) that has been used particularly to evaluate the clinical rosters.

A locked suggestion box is placed in the student foyer to allow student feedback on programmes and papers offered by the Institute and on compliance with the AVMA standards.

7.7 Recommendations

We believe the students in the Massey University Veterinary Programme are well supported by committed teaching-orientated faculty who have a close and supportive relationship with their students. The faculty numbers, clinical resources, physical plant and equipment are capable of supporting the current student numbers. Examination systems are fair, catalogue information is accurate and appropriate and feedback is encouraged and acted upon through a variety of formal and informal systems.

The student essentials in place at Massey University ensure that well educated and flexibly prepared veterinarians graduate from the programme. Graduates are readily accepted into veterinary employment in New Zealand and are popular and sought after employees in Australia, Britain and increasingly, the United States.

It is recommended that the size of the veterinary class is not increased significantly above 100 students per class for at least 2 years until such time as the outcomes of the teaching methods currently employed to handle classes of this size are properly evaluated and the impact of this number of graduates on the New Zealand veterinary workforce is assessed.

Appendix 7.1

Self-care within the Life Skills Knowledge and Experiences Required as Part of the Massey University BVSc Programme

#	Experience/Knowledge	Year	Fulfilled through
1	Veterinary career options	1	Project in Animal Handling, Behaviour and Welfare (227.105) contrasting the animal welfare considerations in veterinary careers.
2	Time management	1	Lecture in 227.105. Project in 2.5 hour workshop on time management, with a personal plan for time management. Assigned at start of Semester 2, due 30 September plus participation in group session
3	Stress Management	1	Lecture on Stress Management in 227.105 plus participation in 2.5 hour group session on coping techniques for stress
4	Self-awareness & awareness of others - Personality	2	Personality profiles. How personality influences how people interact. In Mechanisms of Disease (227.208)
5	Self-awareness - Physical Fitness	2	Personal Fitness and fitness in horses. Integrative Veterinary Physiology (227.206). Laboratory and treadmill.
6	Personal stress and its management	2	Lecture in Integrative Veterinary Physiology (227.206) after stress lectures.
7	Team/Group work	2	Lecture on Group dynamics plus group assignment. A written reflection on individual contributions groups. In Mechanisms of Disease (227.208)
8	Substance abuse	3	Covered in, Veterinary Pharmacology (227.305).
9	Assertiveness	3	Students to attend a course on assertiveness provided by Counselling Service or satisfactory alternative. Proof of participation required.
10	Dealing with difficult situations, clients, fellow workers	3	Veterinary Clinical Studies (227.306). 2 Lab sessions on interpersonal skills with 2 hours in small groups and 1.5 hours ½ class.
11	Work/leisure balance	4	In Cattle Health and Production (227.404). Dealing with the busy and demanding times.
12	Personal Relationships	4	Small Anim. Med and Surgery (227.405). The impact of veterinary work on family.
13	Grief Management	4	Lecture on grief counselling. (227.405).
14	Personal Financial Planning	5	Development of a personal financial plan after a lecture in law, Ethics, Practice Management and Personal Care (227.501).
15	Career planning	5	Writing a CV. Present a CV for evaluation. Planning out a future career path based on Prelude to Practice for (227.501).

Section 8 – Admission and Enrolment

8.1 Selection Process

Goals

The goals of the selection process are to:

- Ensure applicants have an understanding of the role of veterinarians in society and have experienced the realities of veterinary clinical practice
- Ensure applicants to the professional phase of the degree (BVSc1, Semester 2 and beyond) have the necessary prerequisite knowledge of biology, chemistry and physics and show high levels of aptitude
- Ensure applicants have the necessary academic ability to succeed in the professional phase of the course and as veterinarians
- Ensure a 'level playing field' on which to judge the relative academic merit of the applicants
- Be transparent, legally defensible, and evidence-based
- Minimise administrative overheads and allow the selection process to take place expeditiously and with high levels of fidelity in the brief period between the 1st and 2nd semesters of the BVSc1 year.
- Pay due regard to the University's commitment to the treaty of Waitangi
- Provide accessibility to disadvantaged students who are capable of succeeding in veterinary studies.

Admissions Committee

The BVSc Admissions Committee is responsible for selection of students. Membership comprises:

- i) Chairperson
- ii) The BVSc Programme Director (ex officio)
- iii) The BSc Programme Director (or nominee)
- iv) The IVABS Director for overseas students
- v) Three members of the academic staff who contribute to teaching the BVSc
- vi) A member nominated by the Vice-Chancellor (who also has specific responsibilities for equity and equality issues)
- vii) A representative of the New Zealand Veterinary Association
- viii) The BVSc Programme Administrator (in attendance)

The Chairperson of the Admissions Committee is responsible to the BVSc Programme Director for the transparency of the selection process. To this end, information regarding eligibility requirements and the principles of the selection process are distributed to all secondary schools and universities in New Zealand and made available in detail on the University's and veterinary school's websites. See <http://vet-school.massey.ac.nz/selection.asp>.

The Admissions Committee is responsible through the Veterinary Programme Management Committee to the College of Sciences Academic Board for its recommendations. There is a right of appeal against decisions of the Committee via a separate admissions appeals committee and ultimately via the office of the Vice-Chancellor.

Numbers of students admitted

Admission to the first semester of BVSc 1 is open to all students who successfully qualify to matriculate at a New Zealand University.

From this applicant pool, approximately 100 students are admitted to the professional programme which begins in the second semester of first year. The number of government-subsidised student places (for New Zealand residents) is capped at 340 Equivalent Full Time Students (EFTS) across the entire programme which equates to approximately 75 students per year for the 4.5 years of the professional phase of the programme. The majority of the remaining students are full-fee paying overseas students. From time to time, the Ministry of Foreign Affairs and Trade supports the education of students from Pacific Island nations (Overseas Development Assistance Programme).

Minimum standards to be considered for application to the professional phase

Applicants may be New Zealand permanent residents, Australian citizens or international students with a student visa and Admission with Equivalent Status.

Applicants may be New Zealand permanent residents, Australian citizens, or international students with a student visa and Admission with Equivalent Status.

All applicants are required to

1. Have undertaken a minimum of five days veterinary work experience, completed within the last two years, certified by a veterinarian
2. Have passed the four subjects of BVSc 1, Semester 1 (Chemistry, Physics, Biology of Cells and Biology of Animals), or their equivalent, at a Tertiary Institution.
3. Have sat a Special Tertiary Admission Test (STAT) or Graduate Record Examination (GRE) General Test. The STAT test examines problem solving ability and comprehension of written material.

Domestic and International applicants with no previous tertiary education are required to enrol in BVSc 1, Semester 1 and take the four papers prescribed for that semester.

Domestic and International applicants who have previous tertiary education (at university level) have their academic records assessed to determine whether they have met the pre-requisites of the four BVSc 1, Semester 1 papers. Those who have may apply for entry to Semester 2 based upon the Weighted Grade Point Average (WGPA) that they achieved in their previous tertiary study. Those who have not achieved pre-requisites are required to enrol in BVSc 1, Semester 1, taking the subjects that they are lacking plus other papers to a total of four.

All applicants must have achieved a minimum grade equivalent to a B average before they will be considered for admission to the Semester 2 of the BVSc programme. This is regardless of whether applicants are New Zealand residents, are being admitted under the Overseas Development Assistance programme, whether they apply for special consideration as a member of a disadvantaged group on ethnic or disability grounds, or whether they are admitted to a non-subsidised (full-fee) place.

Past experience has shown that students not meeting this standard cannot cope with the academic rigour of the BVSc degree programme. It is noteworthy that the strict enforcement of this minimum standard led to slow growth in non-subsidised student admissions between 2002 to 2005 because of the inadequate academic standards of many of the initial applicants.

Selection Process

Once the minimum standards are met, applicants are considered for competitive selection based on their Weighted Grade Point Average (WGPA).

Selection of domestic students for subsidised places is based on grades attained at New Zealand Universities (80%) and the results of the Special Tertiary Admission Test (STAT) (20%). The STAT test examines problem solving ability and comprehension of written material.

For assessing academic grades, a weighted grade point average (WGPA) is calculated for grades attained at New Zealand Universities, using the formula:

$$\text{WGPA} = (\text{University Grade Scores} \times \text{Subject Points}) / \text{Total Points}$$

(Where grade scores are 2 to 9 for grades “C to A+” respectively)

For applicants with a break from University study of three years or more, only grades attained after returning to study are normally used to calculate their WGPA, while for students with an academic record at University of more than two years, only the last two years’ grades are used. University grades obtained overseas are not normally considered in the selection process, but details of such study must be provided so the Veterinary Programme Director can determine pre-selection study requirements (i.e. whether Year 1 Semester 1 pre-requisites have been met). Only papers/subjects listed as part of a Science major are included in the calculation of a WGPA.

Admission of non-subsidised (international) students

International students can apply to enrol for non-subsidised places. They must first gain admission to university in New Zealand. They require a student visa and must submit a completed International Student Application. They also must complete enrolment for the papers to be taken in order to generate a weighted grade point average for the selection process.

The available 24 places for full fee paying students has been divided into two groups, allocated 8 and 16 places, respectively.

Group 1 – Competitive Selection into BVSc via Semester One (8 places)

This group is for those people without sufficient prior tertiary education to satisfy the requirements of Group 2. They must enter the first semester of BVSc 1 and meet the academic minima described above before being selected on the basis of their WGPA for the available non-subsidised places. These students also sit the STAT test.

Group 2 – Competitive Selection directly into BVSc Semester Two (16 places).

Direct entry into the professional programme is for those people who already have or are completing an appropriate undergraduate (minimum of two years completed) or postgraduate qualification in the biological sciences, and can be from any country. In addition to the WGPA from their earlier studies, these students must also present results of a GRE test.

There are 3 criteria for eligibility to apply for a Group 2 position:

- A minimum science GPA of 3.00
- Achievement of a minimum Graduate Record Exam general test (GRE) score of 1600
- Successful completion of classes equivalent to the 4 pre-requisite classes (Chemistry, Physics, Cell Biology, Animal Biology)

8.2 Measures to Enhance Diversity

Minorities

An applicant who is a member of a minority group, believing their recorded academic performance does not accurately reflect their true academic potential, may attach details on a separate sheet giving the minority group to which they belong. At least two references of an academic nature must be filed in support of such an application.

A minority group in this context can be defined as an identifiable group, which is generally under-represented in the Veterinary Science degree programme. Such a group may be ethnic or otherwise, as defined in the Human Rights Act (1993); each case will be considered on its merits. Minority groups defined by the Human Rights Act may be based on sex, marital status, religious belief, ethical belief, colour, race, ethnic or national origins, disability, age, political opinion, employment status, family status, or sexual orientation.

In considering such applications the Admissions Committee will assess whether an adequate case is made by the applicant, to show how their membership of the minority group may have depressed their academic performance. Assessment of the two references filed in support of the application also is undertaken. Consideration also is given to the effect that successful minority group applications may have on any persons who will be displaced from selection.

This policy has been approved by the University Academic Board and the Race Relations Conciliator as well as the Assistant Vice-Chancellor - Maori.

Veterinary graduates & part-graduates from overseas universities

Occasionally places are available for overseas veterinary graduates with non-registerable degrees to enter the Year 3 of the programme if there are unfilled spaces available and if they have successfully immigrated to New Zealand. Provided they pass through the last 3 years of the Massey academic programme, they are eligible to graduate with a Massey University BVSc degree.

Additionally, provided students are in good standing in a BVSc or DVM degree programme at another University, they may be admitted by transfer from Years 2 to 4 to complete their BVSc degree at Massey University provided the programme they have undertaken to date covers the prerequisite material required for their point of entry to the Massey University degree. This opportunity is offered only if there are unfilled places available in the year that they wish to join.

Overseas Development Assistance Programme

Up to two applicants from overseas countries without a Veterinary School, supported by the New Zealand Overseas Development Assistance programme, may be selected each year.

Admission to Non-Subsidised Places

The admission of non-subsidised BVSc students from overseas countries has resulted in a marked and beneficial increase in cultural diversity within the programme.

Disabilities

Students intending to enrol for the professional phase of the BVSc degree must be able to complete all requirements for the programme. Students who are aware of any physical or mental condition that might affect their so doing are advised to identify themselves so that

their potential ability to complete the course can be assessed and appropriate advice, taking cognisance of the Human Rights Act, can be given.

8.3 List of Factors other than Academic Achievement Used as Admission Criteria

As mentioned above, the admission process also includes:

- verified experience of veterinary clinical practice
- the Special Tertiary Aptitude Test which accounts for 20% of the weighted grade point average used to rank selections

8.4 Ratio of Applicants to Admissions

Table A Intake of Veterinary Students 2002-2006

	NZ RESIDENTS		OVERSEAS			
			Group 1		Group 2	
Year	A/P*	O/A**	A/P	O/A	A/P	O/A
2006	275/78	81/79	22/8	10/9	35/16	25/15
2005	276/78	81/81	26/8	5/5	30/16	12/10
2004	220/78	75/75	18/8	5/4	?/16	?/16
2003	212/78	78/75	18/24	8/8	N/A	N/A
2002	206/77	79/77	N/A	N/A	N/A	N/A

*A/P = Applications/Positions Available; **O/A = Offers Made/Acceptances; ? = Data not available

The number of applicants for the New Zealand Resident places is always far in excess of the positions available. In the first few years of offering admission to overseas students (i.e. non-subsidised students) there were fewer applicants meeting the minimum entry standards than places available. This has now been rectified as awareness of the Massey University programme has increased. Massey University joined the VMCAS application service for 2007 matriculation and for the 16 Group 2 positions received 144 applicants.

8.5 Current Plans for Assessing the Success of the Selection Process to Meet the Mission of the Veterinary Programme

The influence of the selection process on the quality of graduates is difficult to separate from other influences such as the structure of the curriculum and the quality of teaching. However, the success of the admission process is currently assessed by the following criteria:

- The low number of appeals regarding the decisions of the Admissions Committee
- The low number of students who fail to complete the degree programme
- The high pass rates during each year of the professional curriculum and the high pass rates in the NAVLE
- The acceptable entry-level competency of the new graduates as assessed by the clinical faculty, practitioners-in-residence and contracted clinical teachers in private practice

- The continued strong interest of the majority of new graduates in increasingly under-represented areas of the profession such as mixed animal practice (currently 50-60% of graduates are initially employed in rural mixed-animal practices)
- The very high rate of employment of our graduates (usually 100%)
- The graduate outcomes assessments described in Section 1.3 and Section 12 which include feedback from recent graduates and their employers and indicate a high level of satisfaction with Massey University graduates
- The high regard with which Massey graduates are held internationally

8.6 Recommendations

We believe the selection process achieves the goals outlined in Section 8.1.

Prospective students are provided with easily accessible and understood requirements and a fair and unbiased selection process is used for admission. The number of students admitted to the professional phase of the BVSc is appropriate to the resources available as is required by the New Zealand Education Act. Admitted students are of a high academic calibre and the number that drop out is very low and is usually associated with personal factors. The average duration of studies is highly satisfactory with the vast majority of students achieving their degrees in the minimum time. Graduates are highly sought after and, in their own assessment and those of their employers, usually perform very well in a diverse range of veterinary employment sectors.

The Admission's Committee and Veterinary Programme Management Committee monitor admission processes in professional programmes around the world seeking outcome-based evidence to support changes to the admission criteria currently used by Massey University. To date we feel the weight of evidence still points to academic achievement as being the greatest predictor of future professional success. We conclude there is not sufficient evidence from other programmes (or from our own outcomes-assessment processes) to justify a change to the current admissions process.

The Admissions Committee is currently working with the Assistant Vice-Chancellor (Maori) to develop policies to facilitate the admission of indigenous people to the BVSc programme.

Section 9 - Faculty

9.1 Loss and Recruitment of Faculty

Table A – Loss and recruitment of faculty over the past 5 years (2002-2006)^a

Discipline	Number of faculty lost	Number of faculty recruited	Number of positions yet to be filled
Anaesthesia	3 ^b	1	2 ^c
Anatomy & Histology	3 ^d	3	0
Bacteriology	2	2	0
Genetics	1	0	1 ^c
Pathology	2	2	0
Physiology	2	2	0
Epidemiology	2	2	0
Small animal internal med.	3 ^e	3	0
Small animal surgery	2 ^f	2	0
Equine internal medicine	2	2	0
Equine surgery	2 ^f	2	0
Parasitology	1	1	0
Swine health	1	1	0
Virology	1	1	0
Production animal health	2	2	0
Wildlife	2	1	1 ^c

^a Excludes fixed term appointments; ^b Includes a transfer; experiencing recruitment difficulty

^c Advertising; ^d Includes a retirement and a death; ^e Includes a retirement and an internal transfer

^f Retention difficulty

The academic staffing of the Institute is relatively stable with the principal exception of small animal and equine surgery which have had a higher than desirable turn over during the last decade. Recruitment into these areas has also been difficult although all six positions are currently filled with high quality staff. The reasons for previous resignations have been varied. One problem has been the growing gap between the remuneration of academic and private practice surgical specialists. In recent years, IVABS has been able to partially bridge this gap through ‘off-scale’ salary payments to specialist staff. Another concern is the complex nature of an academic surgical role. High standards of performance are expected in professional service, teaching and scholarship. This problem has been ameliorated by the introduction of a ‘practising clinician’ employment scale. Surgical staff can choose to be employed in the academic track or practising clinician track. Practising clinicians are considered to be ‘clinician educators’. They are required to undertake scholarly work but their promotion does not depend on the establishment of a major research programme.

Turnover of staff in internal medicine has been numerically similar but due to different causes: a resignation, a retirement and the movement of a staff member to another (preclinical) role within the Institute. Prior to this period, turnover has been low.

We are experiencing difficulty in recruiting specialist anaesthesia staff. We have two vacancies. One vacancy is through resignation and the other is a newly-created position in support of the larger class size. At the time of writing we are in negotiation with two suitable candidates but have not yet confirmed these appointments. We have increased the anaesthesia technical staff numbers (from one to three posts) to better support this discipline and to improve the scholarly time available to faculty anaesthesiologists.

Fortunately, unlike many other veterinary programmes we are not having difficulty recruiting and retaining pathologists and we are privileged to employ highly qualified and committed anatomists and physiologists with veterinary qualifications.

9.2 Staff Support for Teaching and Research

Table B – Staff Support for Teaching and Research^a

Area	FTE Clerical	FTE Technical
Vet Teaching Hospital	7	22
Non-Clinical ^b	10	31

^a Excludes casual and fixed-term appointments

^b The majority of the general (non-academic staff) in the non-clinical areas support both the teaching and research activities of academic staff; any attempt to split these roles for this table would have been arbitrary.

The ratio of academic staff to permanent support staff on an FTE basis is approximately 1:0.8 – a ratio which is similar to that found in most New Zealand universities. Casual and short-term appointments are used to supplement this assistance on an as-needed basis.

9.3 Strengths of the Faculty and Support Staff

IVABS is privileged to employ staff with a strong commitment to education. Faculty and support staff have a collegial relationship with students and their day-to-day teaching interactions are guided by a personal sense of responsibility more than an imposed (from above) accountability. i.e. staff care about their students and do everything in their power to create a high quality teaching programme. IVABS is a place where research is fitted around teaching – not vice versa.

As one of the leading veterinary schools in the region, we benefit from the ability to attract an enthusiastic cadre of young, highly motivated and well-trained Australian and New Zealand veterinarians who wish to return to the region after gaining experience and specialty credentials in the US and Europe.

IVABS staff have a strong sense of collegiality and common purpose. As a result, formation of teams (research, teaching and clinical) and mentoring of younger staff is readily accomplished.

The clinical faculty are highly skilled, very well credentialed, enthusiastic and hard-working. They are strongly teaching and client-service orientated.

The senior faculty are international leaders in their fields (to be promoted to the rank of ‘professor’ staff must demonstrate through external-peer review that their work has international influence). They are proud of the veterinary programme and are committed, experienced and considerate academic role models. Senior staff are involved in all facets of the Institute’s operation through membership of the Veterinary Programme Management Committee, Institute Executive and other leadership roles.

9.4 Credentials of the Academic Faculty

Academic staff contributing to the BVSc programme are listed in the tables below along with their credentials. Over 78% of these staff are employed in GL-funded positions derived from university funds and 94% are full time.

The clinical specialty credentials of the academic staff at Massey University include qualifications from the Australian College of Veterinary Scientists (ACVSc), the American Veterinary Specialty Colleges and the Royal College of Veterinary Surgeons of the U.K.

In the Table below, only those with Diplomate status of the American Colleges, Fellowship status of the Australian College or Fellowship qualifications from the Royal College are referred to as “Board Certified”. Several other academic staff at IVABS have achieved specialty registration with the Veterinary Council of New Zealand via “grandfather” clauses. These staff are not recorded as “Board Certified” in the Table below.

Table C - Non-Veterinary Academic Staff contributing to the BVSc Programme

Title	BSc etc*	MS	PhD etc*	Total
Lecturer	2	0	5	7
Senior Lecturer	0	3	2	5
Associate Professor	0	0	4	4
Professor	0	0	5	5
TOTAL	2	3	16	21

* includes other Bachelor degrees (especially BAgSc); # includes other Masters degrees (especially MAgSc)

These figures do not include 8 Research Officers that are solely committed to research activities within the Institute.

Table D – Veterinarians

Title	BVSc only	BVSc & MSc*	BVSc & PhD	Board Certified Only	Board Certified & MSc	Board Certified & PhD	Board Certified, MS & PhD	Total
Assistant Lecturer	4	0	0	0	0	0	0	4
Lecturer	7	2	2	1	0	0	0	12
Senior Lecturer	8	6	17	10	0	0	0	41
Associate Professor	0	0	1	0	0	2	0	3
Professor	0	0	6	0	1	4	2	13
TOTAL	19	8	26	11	1	6	2	73

* includes other Masters degrees also – especially MVSc.

The ratio of academic staff to undergraduate veterinary students is approximately 1 to 5. An expertise database that summarises the skills and interests of the staff will be provided in the Supplements. Appendix 9.2 gives a current list of the specialty credentials of the staff.

9.5 Challenges in Maintaining Faculty Numbers and Quality

The principal challenge for the Institute is the recruitment and retention of specialist clinical faculty. As mentioned above, we have been actively working to overcome this problem by introducing ‘off-scale’ salary payments, establishing the ‘practising clinician’ employment scale and strengthening technical support in under-resourced areas. In addition, flexible employment options are available through which academic staff are permitted on a case-by-case basis (approved in writing by the Head of Institute) to undertake a limited amount of private consultancy work to broaden their clinical experience and improve their remuneration. Lastly, IVABS is actively supporting a number of clinical staff through PhD programmes with the goal of improving their interest and ability to take advantage of the research opportunities offered through an academic career.

9.6 Promotion and Tenure Policies

New Zealand university staff are not offered tenure. However, their interests are protected by detailed individual or collective employment agreements with the University and by the country’s employment legislation which seeks to ensure employees are treated fairly by their employers. The lack of tenure is arguably advantageous to teaching and research quality rather than disadvantageous. It allows poorly-performing staff members to be called to account and, in extreme circumstances, to have their employment terminated. It also promotes a sustained period of contribution while maintaining an appropriate work-life balance in contrast to the ‘boom and bust’ sometimes seen pre- and post-tenure. Security of employment is protected by the aforementioned contracts and legislation. Employees cannot be dismissed without very good reason and only after following an exhaustive performance review process which ensures ample opportunity for improved communication and professional development to remedy any perceived employment difficulties.

Promotion policies are covered in detail by the individual and collective employment contracts. These contracts will be made available to the site visit team in the Supplements along with the Application for Promotion document. Briefly, staff undergo annual Performance Review and Planning (PRP) meetings with their line manager. Satisfactory performance results in progression up the academic (or technical staff) scale until a bar is reached. Accelerated progression up the scale or progression over a bar (e.g. between lecturer and senior lecturer) require a formal promotion application to the College of Sciences peer-review promotions committee. This application must be accompanied by evidence of performance (teaching, research and community/clinical service) and a letter of support from the Head of Institute. The letter provides the Head of Institute the opportunity to extol the virtues of the staff (e.g. teaching excellence) and to outline any particular constraints to performance (such as clinical service duty or personal circumstances).

9.7 University Policy for the Relationship of Research, Service and Teaching to Promotion

The sentiment of the policy is best expressed as follows. All academic staff are expected to show excellence in teaching and peer-recognised excellence in research and scholarship. The University also takes into account the applicant's contribution to his or her profession, and to administration and service within the University. The intent of the policy is simple. If you are a poor teacher, you should not expect promotion. If you do not contribute to knowledge in your discipline, you will not be promoted at the expected rate. However, contribution may come through "scholarship". Thus, clinical staff (especially those on the practising clinician employment track) are not required to have large "bench research" programmes to ensure rapid progression. They must, however, contribute to knowledge via retrospective and prospective studies, clinic research trials or reviews. The time pressure on clinical staff created by their service work is taken into account by promotion committees and the Head of Institute. As a result, clinical staff have shown rapid progression in the Massey University system.

9.8 Part-Time Faculty

The University provides for the appointment of part-time faculty. Remuneration and benefits are negotiable but are usually pro-rata that of full-time academic or general staff. IVABS utilises part-time staff to enhance its teaching programme through the addition of specialist expertise not required or available or affordable on a full-time basis. The Institute also uses part-time appointments to meet the personal circumstances of its staff, in particular those with young families and those near the end of their careers. Four to six part-time faculty have been employed in most years of the assessment period (2002 – 2006).

9.9 Faculty Professional Development Opportunities

Enhancing Teaching Effectiveness

The Training and Development Unit (TDU) offer a variety of courses for University staff that are well patronized by IVABS staff. All new staff appointed to a full time position for more than a year are strongly urged to complete the Learning and Teaching Development Programme in their first year and are required to complete it within two years. Those appointed for one year or less or on a part time basis are required to attend specific half-day courses. The Learning and Teaching Development Certificate is issued on completion of 30 hours of training. In addition to the courses offered by TDU, the Director of the BVSc promotes "in-house" teaching and learning seminars (see Appendix 9.1). Lastly, all academic staff in IVABS are encouraged to have a teaching portfolio that outlines their teaching philosophies, methods, innovations, assessments and achievements. These are provided to supervisors at the annual staff performance review and allow supervisors to evaluate the staff member's commitment to teaching.

Enhancing Research Quality

Methods used to enhance the research quality of staff include:

- Mentoring by the Director of Research & Commercialisation and other senior staff
- Disbursing the majority of external research income back to the staff earning the income

- Investing the funds available from four internal granting rounds (Lewis Fitch, McGeorge PacificVet Fund and Taupo Veterinary Club) in small (up to \$10,000) research grants for new academic staff. This provides the opportunity to guide staff in the art of preparing grant proposals and provides them with money for pilot work.
- Capitalising on alliances such as the Hopkirk Research Institute, the Equine Partnership for Excellence and the National Research Centre for Growth and Development and working toward additional research alliances
- Encouraging IVABS staff to undertake overseas travel to esteemed international universities and receiving sabbatical visitors of high international repute at IVABS
- Investing the Building Research Capability in Strategically Relevant Areas (BRCSRA) funds in the development of research capability (See Research Section)
- Further development of the commercial research programme (e.g. Estendart Ltd)
- Fee concessions for Massey University study and the provision of time to pursue masters and PhD study
- TDU courses on seeking research funds, grant writing and postgraduate student supervision
- IVABS Seminar Series and Research Colloquium to show-case high quality research

Enhancing Clinical Expertise

Methods used to enhance clinical expertise include:

- Mentoring by the Director of the Veterinary Teaching Hospital and other senior staff
- Expected attendance at clinical rounds
- Encouraging IVABS staff to travel to leading veterinary teaching hospitals and private practices
- Encouraging annual attendance at a continuing professional development conference
- Adjunct lecturer programme by which overseas specialists are invited to Massey University to participate in the teaching programme and professional development of staff
- Provision of a Clinicians' Discretionary Fund to allow for investment in the diagnostic work-up of special interest cases
- Reflective practice during periods off-clinics

9.10 Current plans/changes in programme direction that would be affected by faculty retirements, recruitment and retention

The strategies of IVABS and the BVSc Programme have driven the staffing profile rather than the staffing profile driving the strategies. A failure to recruit or retain staff has not yet constrained our activities. That said, the shortage of specialist veterinary anaesthesiologists has resulted in a decision to place a heavier reliance on anaesthetic technicians in the Veterinary Teaching Hospital than we have done traditionally. Furthermore, long periods without a full complement of equine and companion animal surgeons has placed undue pressure on remaining faculty and required IVABS to rely in part on short-term 'locums' to support our long-term faculty. Paradoxically, we have been very pleased with the quality of the teaching from the locums – unencumbered as they are by the full complement of academic responsibilities. Furthermore, several locums have subsequently applied for long-term faculty positions after enjoying the IVABS working environment.

9.11 Recommendations

In conclusion, we believe we have a sufficient number of appropriately qualified faculty to provide a high quality education for our students and to meet the mission of the Institute. Staff are assigned only to subjects they have expertise to teach. Most teaching is performed by permanent faculty. These staff have security of employment despite lack of a tenure system. All staff are encouraged to undertake professional development opportunities and to participate in scholarly activities. Their professional development is monitored through the Performance Review and Planning process.

The Institute is privileged to have staff with a strong commitment to teaching and the welfare of students. The commitment arises in part from the comparatively close relationship between staff and students that has characterized Massey University veterinary teaching since the inception of the programme. This close relationship is perhaps best illustrated by the first name basis of most staff-student interactions. The student-focussed culture of IVABS is a strength that the Institute Executive is conscious of preserving and for this reason, efforts are made to ensure the demands on staff to perform research, scholarship and service are within reason. This requires careful monitoring and year-by-year adjustment of staff priorities by supervisors during the annual performance review and planning meetings.

Key strategies for the Institute in relation to its staff include the following:

- Creating a supportive environment that encourages staff to achieve their best
- Playing to staff strengths in teaching, research, service or administration
- Investing in staff development
- Preserving reasonable work hours to support family life
- Preserving the essential features of the “academic environment”
- Preserving staff-student ratios during the BVSc expansion

Appendix 9.1 – Teaching Development Courses

Modules and programmes offered by the Training and Development Unit include:

- Introduction to Teaching Skills
- Teaching Students of International Origin
- Assessing Students
- Developing Teaching Portfolios
- An introduction to the peer review of teaching
- Developing a Curriculum for a University paper
- Learning about Learning
- Evaluating your Teaching
- Developing and Writing a Study Guide
- Creating Study Media for Flexible Learning
- Online Learning and Teaching Programme (7 modules)

Recent seminars (and attendance) arranged by the Academic Director, Veterinary Science have included:

- Using feedback to improve learning – 30 attendees
- Encouraging active learning – 25 attendees
- Enhancing learning through student – faculty interaction – 26 attendees
- Computer based testing – 20 attendees
- Assessment – 30 attendees
- Clinical assessment – 25 attendees
- Gleanings from the floor of the classroom – approximately 70 attendees
- Experiences teaching clinical veterinary medicine extramurally – approximately 70 attendees
- Learning is messy: Teaching through critical dialogue – approximately 70 attendees
- Software for authoring and delivering scenario-based teaching – approximately 50 attendees

Appendix 9.2 - List of the Specialty Boards/Colleges Represented on the College Faculty, and the Number of Faculty Represented in Each[#]

American College of Theriogenologists <i>Norm Williamson</i>	Diplomate	1
American College of Veterinary Anaesthesiologists <i>Sandra Forsyth, Roz Machon</i>	Diplomate	2
American College of Veterinary Internal Medicine <i>Grant Guilford, Richard Squires, Kate Hill, Joe Mayhew</i>	Diplomate	4
American College of Veterinary Neurology <i>Christine Thomson</i>	Diplomate	1
American College of Veterinary Nutrition <i>Nick Cave</i>	Diplomate	1
American College of Veterinary Radiology <i>Angela Hartman</i>	Diplomate	1
American College of Veterinary Pathologists (Anatomical) <i>Keith Thompson, Bob Jolly, John Mundy, Wendy Roe</i>	Diplomate	4
American College of Veterinary Surgeons (Large Animal Surgery) <i>Elwyn Firth, Fred Pauwells, Richard Archer</i>	Diplomate	3

American College of Veterinary Surgeons (Small Animal Surgery) <i>Barbara Kirby</i>	Diplomate	1
Australian College of Veterinary Scientists (surgery) <i>Andrew Worth</i>	Fellow	1
Australian College of Veterinary Scientists (Anaesthesia and Critical Care) <i>Roz Machon, Vicki Walsh</i>	Member	2
Australian College of Veterinary Scientists (Animal Behaviour) <i>Kevin Stafford</i>	Member	1
Australian College of Veterinary Scientists (Animal Welfare) <i>Kevin Stafford</i>	Member	1
Australian College of Veterinary Scientists (Avian Health) <i>Brett Gartrell</i>	Member	1
Australian College of Veterinary Scientists (Canine Medicine) <i>Grant Guilford</i>	Fellow	1
Australian College of Veterinary Scientists (Canine Medicine) <i>Liz Norman, Frazer Allan</i>	Member	1
Australian College of Veterinary Scientists (Cattle Medicine) <i>Norm Williamson</i>	Member	1
Australian College of Veterinary Scientists (Deer Medicine) <i>Peter Wilson</i>	Member	1
Australian College of Veterinary Scientists (Epidemiology) <i>Roger Morris</i>	Fellow	1
Australian College of Veterinary Scientists (Epidemiology) <i>Mark Stevenson</i>	Member	1
Australian College of Veterinary Scientists (Medicine of Australasian Wildlife Species) <i>Richard Norman</i>	Member	1
Australian College of Veterinary Scientists (Sheep) <i>Dave West</i>	Fellow	1
Australian College of Veterinary Scientists (Small Animal Medicine) <i>Wendi Roe</i>	Member	1
Australian College of Veterinary Scientists (Veterinary Radiology) <i>Mark Owen</i>	Fellow	1
Australian College of Veterinary Scientists (Veterinary Radiology) <i>Andrew Worth, Mark Owen</i>	Member	2
European College of Veterinary Anaesthesia <i>Craig Johnson</i>	Diplomate	1
European College of Veterinary Internal Medicine (Companion Animals) <i>Richard Squires</i>	Diplomate	1
European College of Veterinary Surgery <i>Barbara Kirby</i>	Diplomate	1
New Zealand Veterinary Council (Ophthalmology) <i>Craig Irving</i>	Specialist	1
New Zealand Veterinary Council (Pathologist) <i>Mark Collett</i>	Specialist	1
New Zealand Veterinary Council (Parasitology) <i>Bill Pomroy</i>	Specialist	1
Royal College of Veterinary Surgeons (Theriogenology) <i>Tim Parkinson</i>	Fellow	1
Royal College of Veterinary Surgeons (Diploma in Veterinary Radiology) <i>Richard Squires</i>	Diplomate	1
Royal College of Veterinary Surgeons (Diploma in Veterinary Anaesthesia) <i>Craig Johnson, Paul Chambers</i>	Diplomate	2

Some staff have more than one specialty qualification and thus appear twice in this table.

Section 10 - Curriculum

10.1 Introduction

The Massey University BVSc degree is the only veterinary degree taught in New Zealand. It aims to appropriately educate and develop veterinarians to serve the interests of a country which is heavily reliant on animal production to maintain its export earnings and thereby its place in the world. It is nationally important that our veterinarians are well respected and recognised for their knowledge, skills, values and attitudes. It also is critical to the profession's success that veterinarians are recognised by their clients for these attributes. While Massey University produces veterinarians primarily for New Zealand and the conditions occurring here, graduates from this university are internationally recognised for their skills and practical abilities and many choose to work off-shore. The curriculum works to achieve these objectives. The BVSc (Massey) is the standard in New Zealand against which veterinary education elsewhere is judged. The Veterinary Council of New Zealand states its registration policy to be that the minimum standard of veterinarians being registered in New Zealand will be equivalent to the minimum standard expected of Massey University graduates.

The BVSc curriculum is delivered over 5 years, generally after 7 years of high school training. The professional phase of the Massey University veterinary degree lasts for 4.5 years after one semester of pre-veterinary science. The curriculum is structured to study the normal animal and environment, followed by study of the abnormal animal and then the study of "return to normal". In addition to return to normal, the clinical curriculum addresses requirements for the optimisation of production, performance and wellbeing of animals. The programme is near the completion of a curriculum change which in 2007 will see its implementation in the 5th (final) year of the course. Previous significant curriculum revisions were introduced in 1987 and 1995.

Clinical aspects of the production animal curriculum emphasise a herd health and production enhancement approach. Problem-based and situational learning is intercalated into the teaching programme throughout the curriculum. All domestic species along with wildlife are covered. All undergraduates follow the same curriculum in Years 1 to 4 of the programme, but, in Year 5, they select species-based clinical tracks for ~25% of their curriculum during that year. In addition, each student selects 2 week-long special topics as part of their 5th year curriculum.

By far the majority of teaching in Years 1 to 4 of the programme is conducted at the University. In Year 5, ~70% of clinical instruction occurs in the University; the remainder occurring in private clinical practices. Instruction in private practices is delivered on a formal, contractual basis in 4 practices (one equine, one small animal, two production animal) and informally in other practices. During Years 1-4 of the programme, students undertake 14 weeks of practical experience on farms and 8 weeks "seeing practice" during vacation times in private veterinary practices and other veterinary establishments.

The curriculum and delivery of courses at Massey University undergoes continual adjustment to achieve introduction of new knowledge, teaching methods and educational philosophies as well as to meet new requirements emerging in the profession. The structure of the teaching programme and its oversight are aimed at ensuring that the programme delivers the type of veterinary degree training that is required by a broad group of stakeholders. In the current

arrangements, representatives of stakeholders are charged with providing direction to the development of the veterinary teaching programme, through the Veterinary Programme's Strategic Advisory Committee convened by the Academic Director of the Bachelor of Veterinary Science Programme. The new (2003 onwards) curriculum was developed as a result of a consultation with this group.

10.2 Overall Objectives of the Curriculum

The overall objectives of the course (including values, attitudes and behaviours) have been stated in Section 1.2.1 of the self-study document.

To reiterate "The principal objective of the BVSc curriculum is to produce a competent veterinary graduate with the entry-level knowledge and skills required by registration bodies in New Zealand, the Commonwealth and North America and a commitment to life long learning".

The nature of veterinary practice in New Zealand requires the BVSc curriculum to provide a fundamental level of competency in all domestic species and in meat hygiene and public health. Nevertheless, a growing need is recognised for undergraduate focus to tailor the skills of graduates entering some areas of the profession.

The programme objectives are integrated into the curriculum by having the Veterinary Programme Management Committee (curriculum committee) ensure that the individual papers of the programme are developed and integrated to meet the objectives outlined in the learning outcomes document produced by the Strategic Advisory Committee. There is an ongoing process of review with minor modifications made annually and major curriculum reviews occurring every five years once the changes from the previous curriculum review have been fully implemented through all years of the programme.

10.3 Major Curricular Changes Since Last Accreditation

A major curriculum review commenced in October of 2000 and the developed programme of study was introduced in semester 2 of 2003. This implemented the policy of having the curriculum develop to meet stakeholder needs where stakeholders' views were represented on the Veterinary Programme Strategic Advisory Committee. Comments from previous visits of the VSAAC and the AVMA preliminary and accreditation visits were also noted and considered in the development of the curriculum. The review also considered programme modifications aimed at enhancing the BVSc degree as a result of anticipated changes in class size and resulting increases in teaching faculty numbers. A web based curriculum database was developed and implemented to assist with this review. In the development of the 2003 curriculum, a considerable effort was put into reviewing coverage and integration of material, together with the elimination of unplanned repetition of subject matter, in a series of faculty-wide meetings and in one-to-one discussions with the prospective coordinators of new papers.

The previous curriculum review undertaken internally was conducted during 1992 – 1994 and the resulting changes were introduced into the BVSc programme from 1995 with that year's intake of students. The first cohort of students undertaking that curriculum completed their studies in 1999 and the final cohort has just completed its studies (2006).

The most recent curriculum review (2003) made the following changes to the programme.

- The distribution of instructional material was adjusted to better balance students' workload in different years of the programme.
- Greater emphasis was placed upon self-directed learning.
- Lectures in 5th year have largely been eliminated and such teaching is confined to two short blocks, so that time spent on clinics is uninterrupted.
- The 5th year has been extended to 40 weeks (including exam and study weeks) from the previous 28 weeks to allow increased clinical exposure for students.
- Students undertake clinical externships in contracted practices as a part of the extended final year.
- Students select species-based clinical elective tracks for 9/34 weeks of clinical rosters in their 5th year.
- Veterinary Public Health has been placed in the 5th year of the programme as a "capstone" learning experience.
- The topics of quality management, self-care and professional development are integrated throughout all years of the curriculum and again are drawn together in 5th year block lectures.
- The programme has been designed to achieve greater vertical integration and elaboration of clinical relevance in the basic science components of the programme.
- Elimination of unnecessary material and duplications in teaching has been used to create space.

It was accepted that facilities and resources would not allow a full problem-based learning approach to the curriculum. However, continued developments in computer-based learning are being encouraged and supported with a view to achieving enhanced and efficient learning. The use of contracted teaching is designed to provide additional case exposure and experience to augment and complement the University-based teaching which underpins the Massey University BVSc. The changes to the final year of teaching are discussed in more detail in Appendix 10.1.

10.4 Processes Used for Curriculum Assessment

The assessment of educational outcomes of the curriculum is conducted internally, externally and internationally by a number of means (see Sections 1 and 12).

A major means of assessment is oversight of accreditation authorities such as VSAAC and AVMA. These Committees ensure the programme offered meets the requirements of the registering bodies in Australia and New Zealand, the United Kingdom and North America. The recommendations of these committees are taken very seriously by the Institute and University and where it is within the power of the programme to respond to the recommendations this is done.

Other assessments include formal surveys of former students and employers of graduates and reviews on a discipline-by-discipline basis of the papers being introduced into the new curriculum (a) to identify any problems within the papers and (b) to ensure that the papers meet the learning objectives of the programme and cover the discipline area to an appropriate level.

All papers are subjected to the Student Evaluation of Teaching and Learning (SECAT) process. Another method of assessing paper effectiveness is by the Small Group Instructional Diagnosis technique. Staff are encouraged to undertake reflection on their teaching and provided with staff development opportunities in order to gain the skills to do this effectively.

Opportunities are taken to have papers and activities reviewed by external qualified visitors such as staff spending time at this University as sabbatical visitors. External examiners have also been used to evaluate student performance and to provide feedback on the standards achieved by students in final year and their strengths and weaknesses. Where weaknesses have been observed, these have been addressed by adjusting the teaching programme to overcome them.

10.5 Strengths and Weakness of the Curriculum

The Massey University BVSc curriculum has benefited from regular review and developments that keep it contemporary with global developments in veterinary education. A strength of the programme is that the curriculum developed from a learning outcomes approach that resulted from consultation with a stakeholder group (the Veterinary Programme Strategic Advisory Committee) which included clients, representative veterinary professional groups and teaching staff. Agreed learning outcomes were then reviewed with a trained curriculum development advisor to develop a framework of desired attributes for Massey University BVSc graduates. Along with the momentum for curriculum development, care is also taken to maintain a degree of curricular stability that ensures a sound outcome that is evidenced by producing graduates that maintain respect from others for their knowledge, skills, values and attitudes. We regard the proven process of teaching in the normal, abnormal return to normal model as a strength that is enhanced by teaching on optimisation of production, performance and wellbeing of animals. Our introduction of self-care and wellbeing as an integrated component of the curriculum is also regarded as a strength.

The strengths and weaknesses of our technical curriculum reflect the environment in which Massey University and our veterinary teaching clinics and hospital are located. A clearly apparent strength of our programme is access to a wide range of ruminant species for clinical work on farms in the surrounding area of the Manawatu. This availability is enhanced by the extensive land holdings of Massey University that are run as commercial, teaching and research farms adjacent to the teaching campus. The Large Animal Teaching Unit is such an asset that is very well used throughout the curriculum to maximum advantage and allows the teaching of practical skills with large and production animals in a safe and comfortable facility for staff, students and teaching animals.

There is also considerable strength in our curriculum in the teaching of companion animal medicine and surgery utilising our modern or well maintained and attractive facilities. Teaching in primary accession medicine and surgery is well supported by the activities of the teaching hospital and clinics and further enhanced by contracted practices such as the nearby CityVets clinic. Excellent use is made of the companion animal case material to compensate for the modest case numbers.

A further strength of our new curriculum is the closer arrangements with the veterinary profession through the increased exposure to clinical experience in commercial clinical practice in 227.503. It was a desire of the strategic advisory committee to allow greater exposure of students to the realities of clinical practice and the business of practice by having

greater input into undergraduate education by veterinary practitioners. Our current curriculum achieves this without compromising previous standards of on-campus instruction.

As a result of the increase of clinical time in the later part of the programme through removal of most didactic teaching, there has been a compaction of material that involves the learning of many new names and concepts in subjects like microbiology and parasitology into the third year of the degree. In the first year that the new curriculum was taught, some students expressed concern that too much was being expected of them. Adjustments were made to the programme and student attitude improved considerably among third year students for the second offering of the year. Further improvements are also being introduced next year.

10.6 Preceptor, Externship and Contracted Clinical Teaching Programmes

Preceptorship and externship programmes are undertaken as practical work experience with farmers and ‘seeing practice’ with veterinarians. They are compulsory requirements for completion of the degree. A set of guidelines and regulations regarding practical work is made available to students in the Practical Work Handbook.

The practical work required by Regulation 1(c) for the BVSc course regulations, is as follows:

- (a) not less than 14 weeks practical farm work;
- (b) not less than 6 weeks veterinary practical work during years 3 and 4 of the programme.

There is a further requirement for 2 weeks of dairy cattle practice in the Spring of 4th year, 7 weeks of veterinary practical work in 5th year and 1 week of meat processing experience as a part of Veterinary Public Health requirements in 5th year.

The aim of the practical farm work is to give some experience in animal production, and familiarity with the environment of farming. The students are expected to obtain varied experience, particularly with sheep, horses, beef and dairy cattle. They are required to carry out their work on approved farms, to supply satisfactory reports, and to provide certificates from employers stating the periods of employment.

The veterinary practical work provides experience of veterinary practice and the disease control and meat hygiene activities of Government Regulatory Authorities. The students are required to carry out this work at approved places and to provide certificates from suitable persons stating the periods spent in each class of work.

Credit is given only for the practical work completed in accordance with the conditions detailed by the Veterinary Practical Work Committee.

Contracted clinical teaching is used to supplement the clinical instruction available through the Veterinary Teaching Hospital. The contracted clinical teaching contrasts to the ‘seeing veterinary practice’ experience described above in that it is a learning outcome-driven (i.e. learning outcomes are agreed in advance), structured, educational programme including assessment. The veterinary practices are paid for their teaching services and there are regular meetings between veterinarians from the practice and IVABS staff. Student experience at the practices is assessed formally (interviews and surveys) and informally (student feedback to

clinical staff). Students may spend up to 2 weeks of their final year at each of these practices. Please see Section 5.5 for more information.

10.7 Curriculum Digest

An overview of the curriculum is provided in the Appendix 10.2. Course descriptions are available on the Vet School website at <http://vet-school.massey.ac.nz/coursedetails.asp>

10.8 Audit of Selected Curricular Content

Please see Appendix 10.3.

10.9 Plans for Curricular Revisions

The introduction of a revised curriculum will be completed in 2007 so there are no plans for a major curriculum revision currently. However, the curriculum is under constant review as a result of formal and informal student feedback and inputs from staff and the profession.

10.10 Recommendations

We believe the current curriculum meets the learning outcomes of the BVSc Programme, provides a sound understanding of basic biological principles, pathophysiology and the applied clinical skills of veterinary science. The curriculum is well structured, has the appropriate content for a modern programme, is extensive in scope and is rigorously assessed.

The Veterinary Programme Strategic Advisory Committee provides a valuable mechanism through which stakeholders in the veterinary degree programme can make recommendations on the nature of the programme to meet their foreseen requirements. The Veterinary Programme Management Advisory Committee then have the responsibility to develop an appropriate programme to meet those needs. Once the programme is developed the Programme Director must liaise with the Institutes of the University to deliver appropriate papers that ensure that the programme's objectives are being met. This programme management strategy is innovative and offers greater flexibility and responsiveness to the needs of the profession than previous models.

We recommend continued application of the feedback mechanisms relating to the curriculum in order to ensure that it remains contemporary and relevant while meeting the needs of students and the profession.

Appendix 10.1 - Veterinary Clinics (227.503)

From 2007, a new Veterinary Clinics paper (course) has been introduced that makes a number of significant changes from previously. The clinical teaching year has been increased from 24 weeks to 36 weeks. When students are in clinics they are available all day. Previously for half of a year students attended lectures for 2 hours in the morning. The only remaining didactic teaching in the 5th year of the programme is in the courses in 227.501 and 227.503 that occur in a 2 and a 1 week block. Students have the option to choose a 9-week clinical elective track. Tracks available are Small Animals, Production Animals, Mixed Practice, Equine and a Special track for students whose interests are not otherwise accommodated.

Core rosters, taken by all students, include Small Animals (medicine, surgery, imaging and anaesthesia): for 7 weeks; Production Animals (including 2 weeks spring medicine in Year 4 and one week of preventative medicine) for 5 weeks; Equine Hospital for 3 weeks; Necropsy and clinical pathology for 2 weeks; and tutorials for 2 weeks. All students are also required to spend one week in a meat processing plant, as a part of 227.502. Roster weeks for tracks are shown below. These are additional to the core weeks

Small Animals	Mixed Practice	Production Animals	Equine
Medicine (2 weeks)	Sheep and Beef (2 weeks)		Massey Equine clinic (3 weeks)
Imaging (1 week)	Animal Health (spring: 1 week)	As for mixed practice	Equine Externship (2 weeks)
Surgery (2 weeks)	Farm Service clinic (spring: 1 week)		Equine EMS (2 weeks)
SA Externship (1 week)	RP Externship (spring: 1 week)		
Clinics/tutorials in emergency and critical care (1 week)	Small animal externship (1 week)	Pastoral management (1 week)	
	Equine EMS (1 week)	Dairy field trip (1 week)	
2 Special Topics	2 Special Topics	2 Special Topics	2 Special Topics

“Special Topics” are week-long, one-off offerings of an item. A list of these is given below

Small Animal Medicine	Holistic medicine
Imaging	Animal Welfare
Equine Medicine and Imaging	Animal Behaviour
Avian Medicine and Surgery	Veterinary Business Management
Sheep and Beef Production	Clinical Pathology
Pastoral Dairying I (Waikato)	Intensive Dairy Systems
Pastoral Dairying II (Southland)	Pastoral Management
Deer Production	

Students also spend a minimum of 7 weeks “seeing practice” (EMS). They are encouraged to use this time to develop both core and species-related interests. Many students choose to divide this time between seeing practices locally in New Zealand and in Teaching Hospitals/private practice overseas.

Appendix 10.2 - Overview of the BVSc Curriculum

Course Regulations

1. Every candidate for the Degree of Bachelor of Veterinary Science shall:
 - a. follow the prescribed course of study for not less than five years;
 - b. pass the examinations hereinafter prescribed; and
 - c. perform to the satisfaction of the Academic Board approved practical work of normally not less than 20 weeks, which need not be consecutively; students not completing this practical work requirement by 30 September in the year of the sixth examination will be ineligible to sit this examination.
2. There shall be a first, second, third, fourth, fifth and sixth examination. The subjects of the examinations shall be:

Year 1 BVSc

Semester One (pre-selection) [first examination]

Paper No	Paper Title	Credits	Requirements
123.101	Chemistry and Living Systems	15	
124.111	Physics for Life Sciences	15	
162.101	Biology of Cells	15	
199.101	Biology of Animals	15	

A candidate who has attained a sufficiently high standard in Chemistry, Biology or Physics and/or Mathematics in the Entrance Scholarship examination or University Bursaries examination may be exempted by the University from passing one or more of any of the subjects of the first examination, but will be required to substitute other approved papers.

Semester Two (post-selection) [second examination]

227.102	Biochemistry for Veterinary Science	15	
227.103	Veterinary Anatomy I	15	
227.104	Veterinary Physiology I	15	
227.105	Animal Behaviour, Handling and Welfare	15	

Year 2 [third examination]

227.201	Animal Science for Veterinarians	33	
227.202	Veterinary Genetics and Breeding	12	
227.203	Veterinary Anatomy II	15	
227.204	Veterinary Physiology II	15	
227.205	Comparative Veterinary Anatomy	15	
227.206	Integrative Veterinary Physiology	15	
227.207	Mechanisms of Disease	15	

Year 3 [fourth examination]

227.301	Veterinary Pathology I	25	
227.302	Veterinary Microbiology and Immunology	23	
227.303	Veterinary Parasitology	19	
227.304	Poultry, Fish and Wildlife Management and Disease	8	
227.305	Veterinary Pharmacology, Therapeutics and	19	

Toxicology

227.306	Veterinary Clinical Sciences	26
---------	------------------------------	----

Year 4 [fifth examination]

227.401	Veterinary Pathology II	10
227.402	Equine Clinical Studies	19
227.403	Health and Production in Deer, Sheep and Goats	18
227.404	Cattle Health and Production	18
227.405	Small Animal Medicine and Surgery	38
227.406	Pig and Poultry Health, Production and Management	7
227.407	Veterinary Biometrics and Epidemiology	10

Year 5 [sixth examination]

227.501	Law, Ethics, Practice Management and Personal Care for Veterinarians	9
227.502	Veterinary Public Health, Food Safety and Quality Management	15
227.503	Veterinary Clinics	96

- After the first examination, no candidate for the Degree of BVSc may commence the course for, or present themselves for, any examination until they have passed in all the subjects of the previous examination.
- The Academic Board may, under such conditions as it may determine and taking into account the recommendations of the examiners, admit any candidate to a supplementary examination in a subject or subjects in which the candidate failed to gain a pass.
- Except for supplementary examinations, a candidate must offer all subjects of an examination at the one examination.
- Notwithstanding Regulation 5 above, a candidate who has satisfied the requirements in a subject for any examination at a University or other tertiary institution where, in the opinion of the Academic Board, the content and standard are substantially the same as for the degree of BVSc may be exempt from examination in that subject.
- Notwithstanding Regulations 3 and 5 and subject to the approval of the Academic Board, candidates may be permitted to enrol in the BVSc course at a point later than the second examination provided they have been granted sufficient exemptions to allow the completion, in one academic year, of all requirements up to and including those for the examination relating to the year of entry.
- Candidates who withdraw or who are excluded from the course will be readmitted to the course only with the approval of Academic Board and under such conditions as it may determine. Applications for readmission should be addressed to the Academic Programme Director and received by 1 September in the year preceding proposed entry.
Note: Candidates withdrawing or excluded under the 'old' Regulations (operative prior to 1995 or 2003) and seeking readmission to the course when the 'new' Regulations are in force will be required to re-enrol under the conditions of the 'new' Regulations.
- Candidates of sufficient merit may be awarded the degree with Distinction, and for this award, results of the second, third, fourth, fifth and sixth examinations shall be taken into consideration.

Appendix 10.3 – Audit of Selected Curricular Content

	Paper # / Hours	Paper # / Hours	Paper # / Hours
Clinical Reasoning & Problem Solving			
Critical Patient Care	-	-	-
Intensive care & emergency medicine	227.207 – 7 hours	227.405 – 7 hours	227.503 – 32.25 hours
Pain management	227.206 – 5 hours	227.105 – 1 hour	227.503 – 25.5 hours
Principles & hospital practice for isolation of infectious disease	227.304 – 1 hour	227.405 – 1 hour	227.503 24-75 hours
Information Management and the Medical Record	-	-	-
Herd health	227.406 – 11 hours	227.304 – 26 hours	227.503 – 18.75 hours
Individual animals	227.406 – 2 hours	227.503 – 64.75	
Human Animal Bond	-	-	-
Behaviour	227.105 – 31 hours	227.503 – 14 hours	227.405 – 4 hours
Animal Welfare	227.206 – 10 hours	227.105 – 15 hours	227.503 – 26.5 hours
Euthanasia & grief counselling	227.405 – 2 hours	227.105 – 1 hour	227.503 – 17.25 hours
Epidemiology & Zoonoses	-	-	-
Regulatory principles	227.304 – 6 hours	227.503 – 17.5 hours	
Epidemiology	227.406 – 2 hours	227.304 – 4 hours	227.503 – 19.75 hours
Animals & the environment	227.304 – 18 hours	227.406 – 1 hour	227.503 -11 hours
Zoonoses	227.406 – 3 hours	227.304 – 20 hours	227.503 - 23.25 hours
Food safety	227.406 – 1 hour	227.304 – 8 hours	227.503 – 26.5 hours
Exotic animal disease	227.303 – 2 hours	227.405 – 2 hours	227.503 – 12.5 hours
Molecular and Cell Biology			
Professional Development	-	-	-
Career knowledge/options	227.406 – 3 hours	227.304 – 1 hour	227.503 – 97 hours
Attributes & worth of a professional	227.207 – 1 hour	227.406 – 1 hour	227.503 35.5 hours
Ethics	227.207 – 4 hours	227.406 – 2 hours	227.503 – 23.62 hours
Communication	227.207 – 1 hour	227.406 – 1 hour	227.503 – 73.5 hours
Business and practice management	227.503 – 69.37 hours		
Clinical techniques & Skills	-	-	-
History & physical exam	227.207 – 18 hours	227.403 – 6 hours	227.503 - 90.12 hours
Hands-on clinical procedures (e.g. catheter placement etc.)	227.405 – 30 hours	227.403 – 36 hours	227.503 – 213.37 hours

Section 11 – Research Programmes

11.1 Examples of Research Programmes of Emphasis & Excellence

The Institute has focussed on a set of over-arching, multidisciplinary research programmes of key importance to New Zealand. These programmes are:

- Animals and society (including welfare and bioethics)
- Emerging diseases affecting biosecurity, trade or public health
- Food safety and quality
- Growth and development and musculoskeletal rehabilitation
- Mycobacterial diseases (tuberculosis and Johne's disease)
- Nutritional management of animal production & diseases
- Reproductive management and diseases
- Spatial epidemiology
- Wildlife health and conservation

Most of the research programmes are composed of two or more research groups gathered together under the over-arching theme of the research programme. The majority of the research programmes are entirely IVABS-based drawing their expertise from staff in a variety of different management groups. Some research programmes draw on staff from other University units and some form part of larger University-wide, New Zealand-wide or international research programmes.

Several IVABS research programmes have been formalised into research "centres". Thus, the majority of the spatial epidemiology research is conducted by the staff of the EpiCentre, the majority of the wildlife research by members of the New Zealand Centre for Wildlife Health, and the majority of the "animals in society" research by the staff of the Centre for Companion Animal Health and the Centre for Animal Welfare and Bioethics. The usual reason for the formation of a Centre is to improve the marketability of the research expertise to funding groups. On occasion, Centres have been formed to "glue" distinct University groups or external parties into formal collaboration. This is true of the Centre for Animal Welfare and Bioethics and of the Hopkirk Research Institute and National Research Centre for Growth and Development, respectively. The principal centres to which IVABS staff contribute are listed below:

- Centre for Animal Welfare and Bioethics
- Centre for Companion Animal Health
- EpiCentre
- Hopkirk Research Institute
- National Research Centre for Growth and Development
- New Zealand Centre for Wildlife Health

Some IVABS research work is undertaken by spin-out companies. The most important of these companies is Estendart Ltd which undertakes contract research for pharmaceutical companies to Good Clinical Practice and Good Laboratory Practice standards.

In addition to the research conducted under the auspices of the research programmes, centres and companies, individual academic staff undertake a diverse array of small research projects.

The Institute recognises that this type of ‘blue-sky’ research is an important element of academic freedom and creates the diverse academic environment treasured by many staff.

A brief description of five of the principal research programmes of the Institute follows.

11.1.1 Emerging Diseases Affecting Biosecurity, Trade and Public Health

Introduction

The team capitalises on the synergistic expertise of epidemiologists, molecular biologists, parasitologists, infectious disease experts, pathologists and veterinary clinical specialists. The research integrates epidemiology, management and health.

Groups contributing to the programme

The Emerging Diseases research programme draws upon and integrates research performed by staff belonging to most IVABS groups including: the EpiCentre, the Infectious Diseases and Public Health Group, the Pathobiology Group, the Pastoral Livestock Group, the Hopkirk Research Institute and Massey Equine. The research work of the Emerging Diseases programme overlaps with that of the Animals and Society, Food Safety, Musculoskeletal, Mycobacterial, Nutritional, Reproductive, Spatial Epidemiology and Wildlife research programmes.

Team Size

Twenty-nine senior researchers available for a combined total of 8 FTSE.

Overview of current projects

Recent areas of research include tuberculosis, Johne’s disease, Neospora epidemiology, significance and vaccination, trace elements, lameness in cattle and horses, BSE, BVD, *Brucella ovis*, *Salmonella brandenburg*, *Campylobacter*, *E. coli*, Leptosporosis, *Trichinella spiralis*, retroviruses, equine herpes, cryptosporidia, nematode parasite anthelmintic resistance, pleurisy and ovine pneumonia.

11.1.2 Growth and Development and Musculoskeletal Rehabilitation

Introduction

This research programme draws together the Institute's expertise on musculoskeletal anatomy and physiology, growth and development, exercise physiology, equine locomotion, equine and companion animal orthopaedic diseases and rehabilitation. The team integrates research on nutrition, growth and development, athletic injury, and health.

Groups contributing to the programme

The Growth and Development and Musculoskeletal Rehabilitation research programme draws upon and integrates research performed by staff belonging to the following groups: Massey Equine, Centre for Companion Animal Health, Comparative Physiology and Anatomy Group, Pathobiology Group, EpiCentre, Institute of Food, Nutrition and Human Health, the Equine Partnership for Excellence and the National Research Centre for Growth and Development.

Team Size

Sixteen senior researchers available for a combined total of 4 FTSE.

Overview of current projects

Current projects include: equine bone mineral density during development and exercise, effect of early exercise on cartilage health, influence of exercise on tendons, factors influencing tensile strength in tendons, structure of the equine growth plate, metacarpal injuries, computerised gait analysis, trace element supplementation, adequacy of equine pasture nutrition, developmental diseases of horses, diagnostic imaging of companion animal tendons and rehabilitation of animals with musculoskeletal injuries; effects of foetal programming on lifetime productivity and health.

11.1.3 Nutritional Management of Animal Production & Diseases

Introduction

The primary focus of this programme is sustainable pastoral production systems. The University manages 2000 hectares of farmland that provides unsurpassed opportunities to conduct cost-effective research into pastoral production and health. The team integrates the expertise of soil and pasture scientists, ruminant nutritionists, animal scientists, physiologists, parasitologists, and veterinary scientists. The focus of the team is “pre-farm gate” but it works closely with other Massey University research groups with expertise in agribusiness, development of innovative food and fibre products, and the influence of food on human health to form a seamless, pasture-to-plate research conglomerate.

Groups contributing to the programme

The Nutrition research programme draws upon and integrates research performed by staff belonging to the following groups: Pastoral Livestock Group, Dairy Systems Group, Infectious Disease and Public Health Group, the Deer Research Unit, the Institute of Food, Nutrition and Human Health, the Institute of Natural Resources and the National Research Centre for Growth and Development. Collaborative links include AgResearch and the Fonterra Research Institute.

Improved animal production from pasture also requires the identification of reproductive and animal health constraints to production. Thus, there is considerable overlap between this research programme and the Reproduction and Emerging Disease programmes.

Team Size

19 senior researchers and support staff available for a combined total of 7 FTSE.

Overview of current projects

Recent areas of research include evaluation of forage species for growth, trace element deficiencies, profiling and supplementation, digestive physiology, ruminant nutrition, feed efficiency, optimising genetic gain, growth and meat quality in cattle, effect of liveweight on efficiency of grazing cows, interactions between production systems and reproductive performance, alternative/sustainable control strategies for nematode parasitism, minimising health constraints to production, pastoral animal welfare, dryland farming strategies, alternative forages and the environmental impact of farming practices.

11.1.4 Reproductive Management and Diseases

Introduction

IVABS has a strong research programme in reproduction. This programme includes research into basic reproductive physiology, conservation endocrinology (endangered wildlife), reproductive management, reproductive diseases, the interactions between production systems and reproductive performance and the application of reproductive technologies to pastoral production systems. Massey University has had a tradition of solving industry-related genetics problems since the 1930's, when Dr Dry uncovered the mode of inheritance of hairy fibres in Romney sheep. Ultimately this work led to the development of the Drysdale, a specialist breed for carpet wool production.

Groups contributing to the programme

The Reproduction research programme draws upon and integrates research performed by staff belonging to the following groups: Comparative Physiology and Anatomy, Dairy Systems Group, EpiCentre and Pastoral Livestock Group.

The research work of the Reproduction programme overlaps with that of the Emerging Diseases and Nutrition research programmes.

Team Size

Eight senior researchers available for a combined total of 3.5 FTSE.

Overview of current projects

The team is currently working in a number of inter-related areas of reproductive performance. Work includes the reproductive physiology of endangered birds. In dairy cattle, the main focus is in the interactions between production systems and reproductive performance, particularly in relation to the diversity of genetic strains that are currently represented in the national herd. Another major interest is the automatic detection of oestrus in large herds to reduce reliance on inductions. There is also a significant interest in emerging diseases of reproduction such as neospora and in mastitis control strategies. Work extends into areas of research which have been identified by the dairy industry as of critical importance to the sustainability of the national dairy herd: namely, (i) development of dairy management systems that allow high genetic merit animals to breed regularly, (ii) selection and multiplication of cows that are both fecund and productive and (iii) identification of key genetic and metabolic limits of reproductive outcomes (iv) investigating the physiological basis of high/low fecundity in cattle that are genetically highly selected for production traits (v) limitations imposed by management on herd reproduction. In sheep, projects include the effects of shearing on lamb survival, methods to reduce reproductive wastage, managing triplets and all-year-round lambing. The genetics staff also lead a variety of industry improvement programmes.

11.1.5 Spatial Epidemiology

Introduction

The Epidemiology research programme is centred on the staff of the EpiCentre. The EpiCentre is the largest veterinary epidemiology training and research centre in Australasia and is widely considered to be one of the leading groups in the world. The Centre offers expertise in the understanding of disease in animal populations and methods for controlling diseases.

Groups contributing to the programme

The EpiCentre's research is performed in collaboration with staff of the following groups: Pastoral Livestock, Dairy Systems, Massey Equine, Infectious Diseases and Public Health, Pathobiology, Centre for Companion Animal Health and the Institute of Information Sciences and Technology. The research work of the Epidemiology programme overlaps with that of the Emerging Diseases, Mycobacterial, Food Safety and Quality, and Animals in Society research programmes.

Team Size

Six senior researchers available for a combined total of 3.5 FTSE.

Overview of current projects

Current projects include development of a decision support system for control of bovine tuberculosis; strategic geographical modelling of the epidemiology and control of bovine tuberculosis in possums and cattle; development of methods to vaccinate opossums against bovine tuberculosis; lameness in dairy cattle; respiratory disease in pigs; epidemiology of bovine spongiform encephalomyelitis in the UK; epidemiology of Johne's disease; epidemiology of bird flu; development of software to standardise and semi-automate import risk analysis; development of biosecurity software for the Swiss Government (KodaVet).

11.2 Examples of Evolving Research Programmes

11.2.1 Hopkirk Research Institute

For the last 40 years, New Zealand's animal health research capability has been fragmented between the Wallaceville Animal Research Campus in Upper Hutt (established 1905) and the Massey University, veterinary faculty in Palmerston North. In 2005, AgResearch (a Crown Research Institute) decided to close the Wallaceville campus and agreed to relocate the 60 science staff of their Animal Health Platform to a purpose-built research facility adjacent to the IVABS building. The building will be leased to AgResearch with occupancy beginning in mid-December 2006.

The food safety and mycobacterial research teams of IVABS will be moved into this building to join their AgResearch colleagues who will be researching infectious disease (including mycobacterial diseases), immunology and parasitology. The principal focus of the IVABS food safety researchers is the molecular epidemiology of food-borne pathogens and that of the IVABS mycobacterial researchers is Johne's disease vaccination and diagnosis.

The co-location of New Zealand's animal health research capability on one site at Massey University has a number of advantages. The co-location almost doubles the number of *full-time-staff equivalent* animal health researchers on the campus and extends the University's leadership in this area of critical importance to the nation's economic and social well-being. The advantages the co-location offers include an increased critical mass of scientists (depth of expertise, synergies, networks), enhanced ability to form cross-disciplinary teams (e.g. clinicians, pathologists and fundamental scientists), expanded postgraduate research programme, and a significant improvement in research facilities (equipment, Level 2 and Level-3 containment laboratories).

11.2.2 Equine Partnership for Excellence

IVABS has recently been successful in establishing a research-based partnership with the equine industry. The Partnership will endeavour to enhance the equine teaching and research programmes of Massey University, and the productivity, profitability and sophistication of the New Zealand equine industry, in domestic and export markets. It will seek to achieve a number of key outcomes including more persons with in-depth, sound, theoretical and practical knowledge of equine science, technology and business entering New Zealand equine industries, improved performance, soundness and reputation of New Zealand horses and maintaining New Zealand's equine biosecurity, health and welfare at world class levels.

The outcomes of the Partnership will be achieved through private sector, Government and University support of the equine teaching and research programmes of Massey University along with international partnering (University of California Davis, Colorado State University, Utrecht). The Government's investment of \$5 million has been matched dollar-for-dollar by various equine organisations – in particular the New Zealand Racing Board. The Government's investment is to be placed in the newly created 'Equine Trust' a subtrust of the Massey University Foundation. The investment income of the Equine Trust (minus an adjustment for inflation) will be available to the trustees of the Equine Trust to invest in research and education projects. The Trust Board is chaired by the Head of IVABS.

The initial focus of the partnership for excellence is on equine wastage, the benefits of exercise on joint health, anthelmintic resistance, benchmarking of reproductive performance, neonatal mortality and equine infectious diseases.

11.3 Breadth and Quality of Institute Research Programmes

Number of staff involved in research

Research-led education is the primary role of Massey University. As such, all academic staff of the Institute are expected to advance knowledge in their discipline by way of research and scholarship. However, it is recognised that individual staff have greater or lesser interest and capability in research and as such the amount of time committed to research and the nature of the research varies. Staff who do not perform much research are required to shoulder a greater share of teaching or clinical duties and there remains an expectation that they undertake scholarly activities.

It is acknowledged that the time commitment of clinical staff to their service work limits their capacity for research. However, clinical staff are still encouraged to undertake scholarly activities, such as case reports, review articles and conference presentations, and to conduct retrospective and prospective studies with a view to advancing the knowledge of the veterinary profession. This type of research and scholarship is given as much weight in promotion rounds as is "bench research" provided it results in publications that contribute knowledge to a discipline.

The following mean and range time commitment to research was reported by academic staff in the most recent annual work load survey: mean = 225 hours, range = 0-1,200 hours. Thus, mean research commitment across the entire faculty is approximately 15% of an FTE. The lowest research workload occurs amongst the clinical staff and the highest amongst physiology and pathology staff.

Measures of Research Productivity

The research productivity of IVABS staff is satisfactory given the relatively high undergraduate contact and clinical service time required of them in comparison to academics in many North American Colleges. Refereed and non-refereed publications are two of the key performance indicators monitored by the University. IVABS academic staff average 1.5 refereed publications per year and approximately 3 non-refereed publications.

Recently, the Government has introduced a nation-wide research quality assessment tool referred to as the Performance Based Research Fund (PBRF). The PBRF-process involves independent peer review of the research standing of all academic staff in the tertiary education sector. Staff are required to compile an 'evidence portfolio' which the reviewers evaluate to assess the quality and quantity of publications, peer esteem and contribution to the research environment (e.g. postgraduate student education) of each staff member. This process confirmed the high research standing of many IVABS researchers but revealed the difficulties faced by clinical staff in establishing active research programmes. The Government has responded quickly to this information and has established a new fund to assist IVABS develop the research capability of clinical staff (see BRCSRA below).

External research funding is another measure used to evaluate research activity and research relevance. The IVABS external research revenue has averaged between \$4.5 and \$6 million per annum over the last 5 years. The research revenue of Estendart Ltd (a university-owned company established by IVABS to undertake contract research for the animal health industry) generates a gross income of approximately \$1.4 million per annum. IVABS wins approximately \$3 million per annum from the competitive Performance Based Research Fund. The revenue earned from the PBRF is a measure of the Institute's research quality in comparison to other academic units from New Zealand universities.

11.4 Building Research Capability in Strategically Relevant Areas (BRCSRA) Fund

The Government has agreed to assist IVABS enhance the research performance of IVABS (and in particular the veterinary clinical staff) by allocating funding through the BRCSRA fund. The BRCSRA money (approximately \$750,000 per annum for three years) will be invested in a series of establishment grants for research groups along with capability funds focussed on the development of research capability in young staff.

The establishment grants are intended to act as 'kick starts' for new research groups that will be sustained in the future by mainstream funding sources. The groupings chosen are in areas of strategic opportunity for the animal health sector. They have capable leadership, joint venture/alliance opportunities and allow the majority of the IVABS faculty to participate in one or more research teams. It is our experience that the formation of research groups is the best way to involve clinical staff (who comprise the majority of the IVABS staff with low or modest research activity) in research and postgraduate study rather than expecting these very busy staff to lead their own individual research programmes.

11.5 Impact of Research on the Professional Programme

All undergraduate students develop some appreciation of research, particularly through projects and assignments.

An introduction to scientific methodology is delivered in the laboratory sessions of 124.111 Physics for Life Sciences. This includes the concepts of hypothesis testing, statistical analysis and error. Research project work, mainly in the form of literature review and integration plus presentation by means of posters, is a requirement in several papers.

During anatomy dissection laboratories students in groups of 4 are required to research, dissect and present their dissection of an anatomical region for the benefit of their classmates. As well as dissecting the preparation for demonstration, students develop a poster presenting the key features and their significance.

Projects in Veterinary Pharmacology at the 3rd year level involve literature based research in which students conduct an analysis of 2 papers on the same subject that are reported as clinical studies in one paper and as scientific studies in the other paper. They are required to analyse, compare and contrast these 2 approaches to recording observations on the use of pharmaceuticals. The time allocated for the conduct of this study approximately 24 hours of effort by the students. Another study in clinical pharmacology requires literature research into clinical trials that use pharmaceutical or other treatments of veterinary interest.

In veterinary microbiology students working in groups of 3 are required to develop a presentation on a microbiological agent and present it to their classmates as an audiovisual presentation. Individual students each take an aspect of the study and provide an individually written report on an aspect of the organism studied and this is integrated into a final document.

As a part of the Meat Works practical experience students are required to design, conduct, analyse and report on a small research project to familiarise themselves with research methodology and processes.

During study of veterinary epidemiology students are instructed in the types of experimental design used in epidemiological studies. This information is put to use in 5th year rosters when they are required to select a published veterinary epidemiological study from the refereed literature and to critique it in terms of its design and conduct. Students then must present their brief (10 to 15 minute critique) of the study to members of their roster group in a seminar setting.

There are opportunities for students that have a particular interest to undertake further research experiences. For instance, summer research scholarships are offered to students by the central university administration and by some research groups. An intercalated research degree is offered in association with the BVSc, the Bachelor of Philosophy. The B.Phil. has a history of attracting very able people but has not been a popular option since the imposition of higher student fees.

11.5 Recommendations

IVABS has a vigorous and successful research portfolio that makes a significant contribution to the prosperity of New Zealand and the knowledge of the global veterinary profession. The research has a significant impact on the professional teaching programme and enriches the educational environment. This success is primarily due to the enthusiasm of the Institute's staff and postgraduate students in association with the guidance of the IVABS Research Office.

The Institute will continue to further develop its research infrastructure and to increase the quality and quantity of its research. The strategies for this include:

- continuing the policy of disbursing the majority of external research income back to the staff earning the income.
- devoting most of the Institute's internal research funding to the principal IVABS research programmes
- encouraging further use of the Institute "loan fund" established to assist staff purchase equipment
- capitalising on alliances such as the Hopkirk Research Institute, the Equine Partnership for Excellence and the National Research Centre for Growth and Development and working toward additional research alliances
- encouraging more sabbatical visitors of high international repute
- investing the BRCSRA funds in the development of research capability
- further development of the commercial research programme (e.g. Estendart Ltd)

The amount of research training within the BVSc is adequate to allow students to understand the processes of research and to participate in research at above the minimum required level if they are motivated to do so.

Section 12 - Outcomes Assessment

A comprehensive set of informal and formal assessment procedures are used for quality assurance purposes to continuously improve the Institute's teaching, research and community service programmes and to ensure that the learning outcomes of BVSc Programme are met.

12.1 Student Outcomes

Veterinary Programme Strategic Advisory Committee

As previously described, this invited group of 'stakeholders' in the BVSc programme is convened to advise the BVSc Programme Director about the attributes that graduates of the BVSc programme should possess to meet the needs of the profession and animal-owning public.

Staff-Student Liaison

The Staff-Student Liaison Committee meets at least twice per year to discuss items of mutual interest or concern. Students also may call additional meetings of the Committee at any time or approach year coordinators or the Programme Director if matters of immediate concern arise. The Programme Director manages feedback from Staff-Student Liaison Committee meetings. This may include discussing matters of concern with individual staff, paper coordinators, year coordinators or the Institute Head and instituting changes to meet the legitimate needs and concerns of students.

The Massey University Veterinary Student's Association has members appointed to the VPMAc that advises the BVSc Programme Director on the management of the degree. The student appointees provide regular feedback from the veterinary students.

The Director of the international veterinary student programme also meets regularly with the international students as a group to discuss issues of particular relevance to these students. These meetings have led to improvements in such matters as loan processes, graduation arrangements and NAVLE timetabling.

An important part of the IVABS culture is the close and collegial professional relationship between staff and students. This greatly enhances the ability of students on a day-to-day basis to provide positive feedback on learning experiences, discuss matters of concern and make suggestions for improvement. It also assists both students and staff better understand the teaching and learning partnership that underpins high quality education.

Student Evaluation of Content, Administration and Teaching (SECAT).

Massey University operates a central programme for obtaining student feedback on papers, the Student Evaluation of Content, Administration and Teaching (SECAT). All papers in the university must have a SECAT evaluation at least once every third offering. Staff may choose to evaluate their papers more often than that and many choose to evaluate their papers every year.

SECAT is a questionnaire-based instrument, which is used near the end of a semester to obtain an evaluation of students' experiences in the paper. There are compulsory questions on the organization of the paper and there are options for evaluation of the contributions of individual teachers to the paper and/or asking further questions on matters such as the

learning outcomes, content, delivery, assessment and time-budget.

Students' responses are collated by an external agency, that analyses numerical data and transcribe responses to open questions. Individual teachers have access to only their own SECAT evaluations but the evaluations of all teachers within the paper are returned to the Paper Coordinator whose responsibility it is to consider if any improvements are necessary. The Head of Institute and BVSc Programme Director review the SECAT scores of all staff members of the Institute. Most IVABS papers and staff achieve very high SECAT scores (a grade of 4 or more on a scale of 0-5). If problems are identified, the Head of Institute and BVSc Programme Director discuss the problematical paper or staff member and then meet with the Paper Coordinator or staff member to discuss the issues raised by the students. A plan of action is agreed at this meeting which may include adjustments to paper learning outcomes, organisation or delivery, mentoring of staff, formal staff-development programmes, and additional reviews of the paper (or staff member) once changes have been made. On very rare occasions, individual comments made by students about teacher behaviour, have been sufficiently concerning to result in disciplinary investigations by the Head of Institute.

IVABS staff take the results of their SECAT evaluations very seriously. To reinforce the personal pride staff have in their teaching, they are asked to include their SECAT documents in all promotion applications. Staff are advised that these scores (along with other evidence of teaching quality) are taken into account during promotion applications. This request reinforces the blunt message given by the Head of Institute to all new staff that if they are not a good teacher then they are in the wrong place.

Local evaluation of papers

Other methods are used, either informally or formally, to complement the information provided by SECAT. Individual paper coordinators and teachers use other questionnaire-based evaluations to ask specific questions about a component of a paper, innovations, or at a mid-point in its delivery to check that a paper is meeting the needs of students. No record of such evaluations is kept centrally and the feedback that is gathered from them is for the use of the people/group that collected it.

As SECAT proved inappropriate to adequately evaluate clinical rosters, Small Group Instructional Diagnosis (SGID) techniques have been used as the primary method of obtaining feedback on the clinical teaching. The SGID is conducted in the final week of the programme (so is primarily summative) by the Director of the University's Training and Development Unit. The findings of the SGID evaluation are sent to the paper coordinator, who then forwards it and/or discusses it with individual roster leaders. Significant changes have been made to rosters on the basis of SGID feedback. In addition to the SGID, once every two or three years, a paper-based questionnaire is used to evaluate the clinical teaching of each contributing member of academic staff. This uses the same basic questions as SECAT, although staff also have the opportunity to ask personalised questions about specific aspects of their teaching if they wish to do so. Both of these forms of evaluation conform to the University's rules for the confidentiality and anonymity of respondents.

Research on aspects of veterinary students' learning

In order to understand more thoroughly the processes of learning that occur within the BVSc programme, two extensive research studies have been undertaken with students and graduates. These studies, undertaken in collaboration with members of staff from the College

of Education, have asked searching questions of students about their perceptions of teaching, and constraints to their learning, in the programme.

The objective of the first study (2001-2002) was to seek the opinion of senior students and recent graduates about the merits of introducing an element of specialisation (i.e. elective tracking) into the 5th year of the programme. The findings of this study were that there was little support for more than a limited amount of specialisation/tracking within the BVSc programme and that there was an overload of work and an excessive reliance on transmission methods of teaching. These findings were used to inform the development of the new curriculum.

The objective of the second study (2003-2004) was to evaluate the workloads and motivation to study of students at each stage of the programme. This study was initiated in response to the results of the first study and to a perception that workloads were excessively heavy in the 4th year of the old curriculum; and also to provide benchmark data about workloads and learning methods against which the reforms of the new curriculum can be evaluated. Workload in parts of the new curriculum (currently, Year 3) have been evaluated (2005), using similar methodology.

Data from the 2003-4 study were used to inform the curriculum review process, whilst that from 2005 has been used as part of the process of validating and interrogating the changes that have been made to the programme in the curriculum review.

Briefly, the findings of the 2003-4 study were, firstly, that workloads were high in Years 3 and 4 of the programme, with the result that students' learning and motivation moved from active, intrinsically-motivated patterns towards passive, extrinsically-motivated patterns. Secondly, interest and motivation declined as students studied each discipline: introduction of a new discipline was always greeted with renewed interest and enthusiasm, whereas after 2-4 semesters of study, those virtues had somewhat waned.

The major uses of these data in the curriculum review process were (i) to limit workloads, (ii) to use instructional methods that favoured active, rather than passive learning methods and (iii) to place a high value on developing students' ability to contextualise the information that they were receiving (especially in regard to pre-clinical disciplines).

The 2005 review of Year 3 (new curriculum) suggested that, whereas these goals had largely been met for Years 1 and 2 of the programme, further review was needed to ensure that workload and the consequent patterns of students' learning also met the goals. This was done prior to 2006: SGID methods were used to evaluate the success of the changes (end of 2006).

Examination results

Written, practical and oral examinations are used to evaluate learning. Short answer and essay questions are favoured over multiple choice questions because of the wish to ensure students are able to integrate and apply their factual knowledge in a way that demonstrates their ability to solve problems. The assessment of clinical competency includes continuous assessment during clinical rotations, demonstration of specific technical skills through practical examinations and a final written and practical examination focussing on an integrative approach to clinical problems.

NAVLE

The NAVLE is an increasingly important external assessment of student learning. Currently only small numbers of Massey students have taken the NAVLE but this is expected to increase as the international students reach the final year of the course in larger numbers. Currently the NAVLE pass rate of Massey graduates and students is 100%.

Table A - NAVLE

Year	Students taking exam(s)	Students passing exam(s)	Average Scores (SD)
2006	7	7	527 (49)
2005	3	3	487 (5)
2005	3	3	559 (60)

Student attrition

As mentioned in Section 7, the student attrition rate after admission is low (usually 0-2 per year). Most students comfortably achieve the necessary learning outcomes. The causes of student attrition most often relate to personal or family circumstances.

Table B – Student Attrition – average number of students lost from each class over the period 2002-2006

Relative Class	Attrition*	% Attrition due to Academic Causes	% Attrition due to Personal Causes	Absolute Attrition**
2006	1/101	100	0	0
2005	6/100	33	67	4
2004	9/99	22	78	7
2003	12/97	67	33	2
2002	12/89	42	58	9

* Students that either withdraw from the programme or move to a different (earlier) class

** Students who leave and never return

Staff Assessments

Staff are encouraged to comment on the adequacy of the staffing, clinical resources, facilities, equipment, and information resources to support learning outcomes via the relevant portfolio holders on the Institute Executive. IVABS has a faculty library representative who liaises closely with a librarian appointed by the Head Librarian to manage IVABS information resources. Staff also have opportunities to raise issues of concern in Management Group meetings, IVABS Forums, Veterinary Teaching Hospital meetings and with Clinical Service Chiefs. Many issues of concern are emailed directly to the Head of Institute, Operations Manager and BVSc Programme Director.

Opportunity for staff to formally comment on the preparedness of students entering phases of education occurs at annual examiners' meetings (during which the grades of individual students are considered and commented upon), curriculum meetings and meetings convened by the year coordinators to review student performance and progress. Staff may take concerns to the Veterinary Programmes Management Advisory Committee. Concerns about

preparedness (or new initiatives) are also considered at the Institute Executive Committee, particularly in circumstances in which the potential solution has resourcing consequences. Many concerns are dealt with on a staff member to staff member basis. The latter has become easier as a result of the elimination of academic departments which in turn means there are no financial consequences if a staff member teaching in one part of the curriculum wishes to contribute to teaching in an earlier area of the curriculum to enhance preparedness or inspire students with the relevance of what they are learning. E.g. radiologists teaching in anatomy.

External examiners and practitioners in residence

Teaching materials, examination questions and student answer scripts of some subjects are sent for external peer review. External examiners have been used in the final assessment of the 5th year students but their use in recent years has been inconsistent because of debate about their effectiveness and place in our quality assurance system. The Institute offers a “Practitioner in Residence” scheme in which leading veterinary practitioners spend 8 weeks with our small animal, dairy and sheep/beef services observing and contributing to our teaching. These practitioners provide valuable informal and formal assessments of the relevance and effectiveness of our teaching on an annual basis.

Rate of employment of graduates

This is used as qualitative assessment of the suitability of our graduates for employment. In all years under review, 95-100% of the graduates wishing to find work are employed within 3 months of the successful completion of their BVSc degree.

Feedback from recent graduates

Massey University veterinary graduates receive temporary practicing certificates from the Veterinary Council of New Zealand when they pass their final examinations in November. The graduates return for their formal graduation ceremony in May of the following year. Prior to their return for graduation, the new graduates are mailed a survey to assess their views on their preparedness for clinical practice. They are also invited to a focus group meeting to discuss the same issue. Informal interaction between staff and the new graduates at the functions surrounding graduation also provides important feedback on the perceptions of new graduates regarding the adequacy of their training.

Results from two surveys are appended in Appendix 12.1. The first was undertaken in 2004, surveying graduates from 2001-3; the second is of the graduating class of 2005, which was undertaken in May, 2006.

Feedback from the Veterinary Profession

IVABS has a close relationship with the New Zealand veterinary profession and receives invaluable feedback on graduate quality through this relationship.

Veterinary Council of New Zealand

Formal feedback occurs in the setting of the Veterinary Council of New Zealand on which the BVSc Programme Director has a statutory appointment. The VCNZ includes veterinarians and lay members of the farming and companion animal sectors. It is responsible for the licensing of degrees from Massey University and veterinary colleges around the world and for the maintenance of professional standards. Membership of the Council allows the BVSc Programme Director to monitor the professional standards of other veterinary colleges, complaints, judicial proceedings, continuing professional development participation, and all statutory matters to do with veterinarians.

New Zealand Veterinary Association

The New Zealand Veterinary Association (NZVA) works closely and positively with IVABS in the interests of new graduates. Communication occurs in both directions with IVABS receiving feedback and guidance from NZVA on such matters as learning outcomes, graduate performance and continuing professional development programmes (such as the MVM) and IVABS contributing to NZVA policy on the employment of new graduates and other policy and operational matters. IVABS staff play significant roles in Special Interest Branches of the NZVA (such as the Deer Branch, Dairy Branch, Sheep and Beef Society, Companion Animals Section etc.) and have numerous daily interactions with their private practice colleagues and recent graduates.

Structured Feedback from the Veterinary Profession

For many years, IVABS has received informal feedback from the veterinary practices in which students do their practical work and our new graduates are employed. We have now instituted formal, structured feedback from the profession by way of in-depth questionnaires and interviews. The first of these surveys was performed in 2004 (see Appendix 12.1) and is to be repeated on a 4 yearly cycle coinciding with the graduation in 2008 of the first class from our new curriculum.

Benchmarking with other Colleges/Schools

IVABS rarely undertakes extensive formal benchmarking on an institute-wide basis – the last being with Murdoch University approximately 8 years ago. However, benchmarking of individual papers is undertaken by way of the invitation for subject-area experts from other universities to review course content and teaching methods. In addition, informal benchmarking occurs extensively by way of the academic networks of the staff. Important amongst these are the participation of the BVSc Programme Director in the Australasian Veterinary Deans' Committee meetings that occur twice annually, involvement of senior staff in accreditation visits of the AVMA and VSAAC, membership of academic staff in the leadership of organisations such as the Australian College of Veterinary Scientists, American College of Veterinary Pathologists, American College of Veterinary Nutrition, staff exchanges, sabbatical and short-term visits to other veterinary schools, attendance at scientific and educational meetings and international academic visitors to IVABS. All of these opportunities allow individual staff to benchmark their own teaching programmes against those of their peers.

Miscellaneous Assessments of Relevance to Educational Outcomes

Teaching Portfolios

As mentioned above, the University recognises that student opinion (SECAT) should not be the only method of evaluating teaching. For this reason, IVABS has adopted the use of Teaching Portfolios as a way of documenting, substantiating and displaying teaching philosophies and accomplishments.

Informal Feedback and Reflective Practice

Reflection by staff about student responses to their teaching, evaluation of the significance of the responses, and informal testing of changes to teaching methodology remain an important part of our management and assurance methods.

Peer review

Peer review of course objectives and content and teaching methodology is employed to develop and evaluate the performance of less experienced staff members. Peer review is usually instigated at the request of a staff member or at the suggestion of the Head of Institute or Group Leader.

Teaching Prizes

Students in each class of the veterinary programme nominate staff for the annual BVSc 1, 2, 3, 4 and 5 teaching awards. Only one prize is allocated by each year-class. The awards are considered prestigious and are given considerable weight in promotion rounds. From time to time, IVABS staff are also successful in University-wide or New Zealand-wide teaching awards.

12.2 Institutional Outcomes

Evaluating whether the College is Meeting its Mission

The Institute meets its mission by way of its academic programmes, research programmes and community services. The methods by which IVABS evaluates the quality and effectiveness of its academic programmes are described above in Section 12.1.

The Institute's research and postgraduate programme quality is assessed by the following methods:

- Research database - The University maintains a research database which records publications, presentations, patents and other contributions. Publications per staff member is a key performance indicator for the Institute. The research output information is also required during the annual performance and planning meeting.
- The dollar value of research grants is recorded.
- The numbers of postgraduate students and postdoctoral research staff is recorded.
- The average completion time for graduate students is compared against normative completion times.
- Progress reports on all postgraduate students are evaluated every 6 months by the Institute's Research and Postgraduate Studies office and the Graduate School.
- Postgraduate graduation and employment rates are monitored.

In addition, as described in Section 11, the research quality, quantity and relevance of the Institute are independently evaluated by a newly established processes referred to as the Performance Based Research Fund (PBRF).

More recently the Institute has begun to pay more formal attention to research "outcomes". Research "outcomes" refer to the influence of our research outputs on the industries and communities we serve. Currently, these measurements are subjective and are determined and tabulated by the researchers themselves.

The principal community service role of the Institute is the clinical services provided by the Veterinary Teaching Hospital. The success of the Veterinary Teaching Hospital in meeting its mission is evaluated by reviews of the academic quality of the clinical teaching (see Section 12.1 above) and the research quality of the clinical staff assessed in the PBRF. In addition, the quality of the professional services is measured by on-going client satisfaction surveys; biannual client satisfaction benchmarking; monitoring of client complaints by the VTH

Director and the associated feedback from staff; standard financial benchmarking indices; and regular dialogue with referring veterinarians.

In addition, to the above methods, we utilise external accreditation reviews by AVMA and VSAAC and the Royal College of Veterinary Surgeons to assess the quality and success of our endeavours.

Adequacy of Resources and Organisational Structure to Meet Educational Purposes

As described in the sections on organisation, faculty, clinical resources and facilities, IVABS has an organisational structure and sufficient resources to meet the needs of a research-led academic mission.

12.3 Clinical Competencies Outcomes

Learning Objectives for Clinical Competencies

The over-arching learning outcomes for the clinical sciences are described in Section 1. In addition to these broad-brush learning outcomes, specific learning outcomes for the clinical sciences are included in each paper and lecture course within a paper. Examples of these for the final year curriculum are given in Appendix 12.2. A book of compulsory procedures that each student must perform before graduation will be included in the Supplements.

The data collected for the listed clinical competencies includes the weekly roster assessments, final examinations including clinical (practical) examinations and the assessments from externships and extramural placements.

12.4 Examples of Changes Made to the Resources and Curriculum Based on Outcomes Assessment Procedures

The feedback from staff and students have led to numerous improvements in staffing in under-resourced areas such as anatomy, pathology, anaesthesia, behaviour, surgery, medicine, radiography, nursing, farm services, epidemiology and food safety. Tailored staff-development courses have also been initiated following feedback from students. Similar feedback has led to many improvements to the facilities including enhanced computer-aided learning facilities and Veterinary Teaching Hospital facilities.

As a result of the development of defined learning outcomes through the Veterinary Programme Strategic Advisory Committee and from information gained through surveys of recent graduates and their employers, as well as input from external review agencies, a number of important changes were made to the new curriculum. These included:

- A more balanced and reasonable student work load
- Increased input from the profession into instruction and improved awareness of the realities of veterinary practice
- A change in philosophy in teaching methods from primarily teacher-centred, transmission techniques to student-centred, constructivist techniques
- Introduction of Animal Handling as a Year 1 class
- The implementation of a limited aspect of tracking into 5th year rosters
- Increased emphasis on clinical exposure, especially during the middle and latter years of the programme
- Enhanced learning on Quality Management

- Development of Public Health as a 5th year “capstone” course
- Increased emphasis throughout the programme on professional development, communication, health and safety, self-care and self-directed learning

12.5 Recommendations

In general, we believe teaching, research and clinical standards and the outcomes of student learning (both at a paper and programme level) are objectively and exhaustively assessed and the results used effectively (by individual academics, paper coordinators, year coordinators, VPMaC and the Head of Institute) to improve the programme.

We are still feeling our way somewhat with the more recently introduced ‘structured feedback’ from the veterinary profession and we intend to keep an active eye on the approaches used by other veterinary colleges to ensure we keep abreast of ‘best practice’.

Appendix 12.1

1. Survey of Practice Owners, Senior Assistant Veterinarians and 2001-3 Graduates (2004)

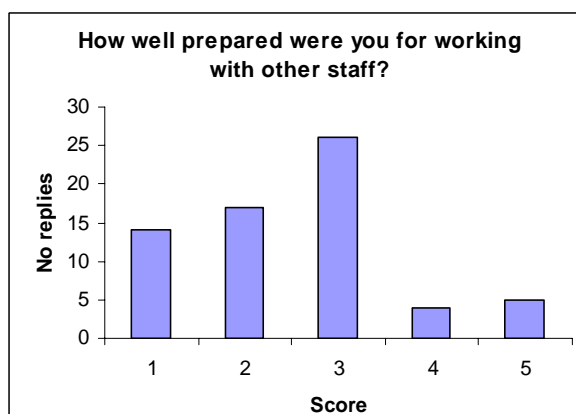
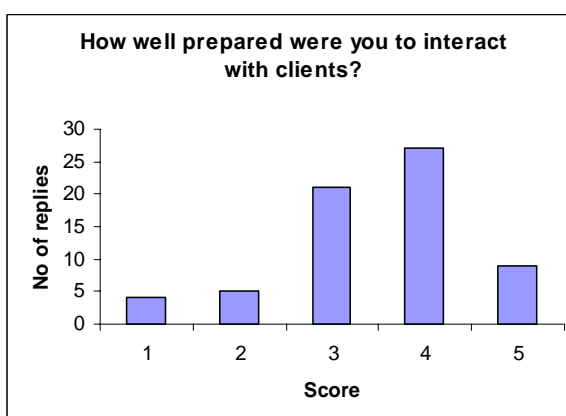
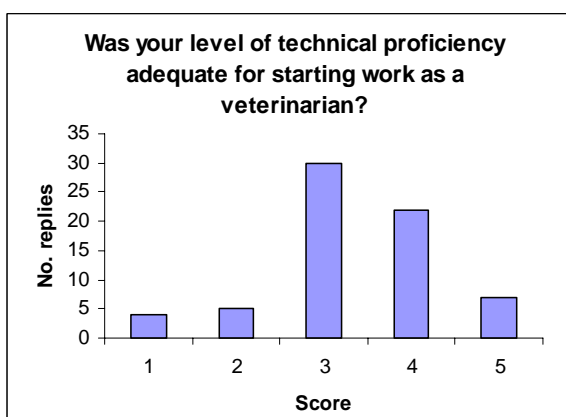
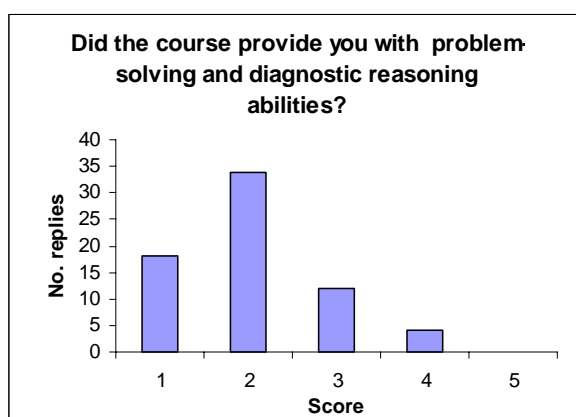
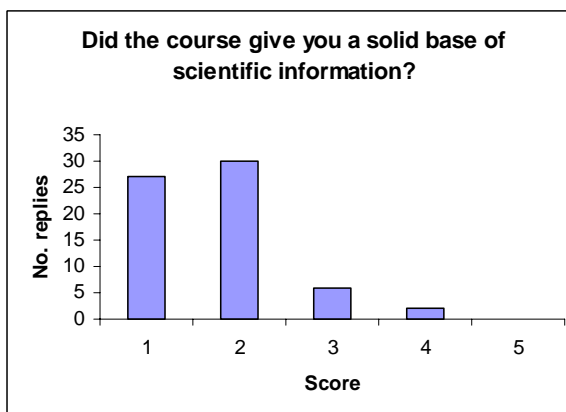
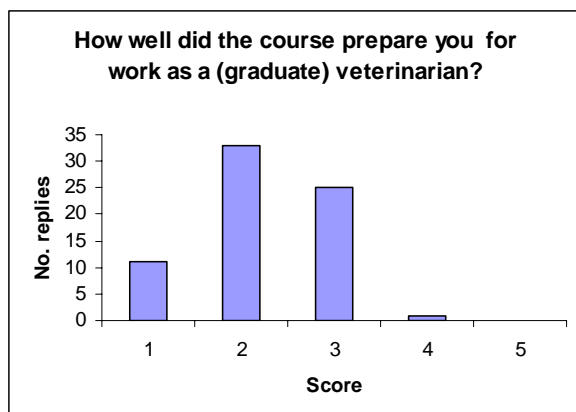
A survey was undertaken, using questionnaires, focus groups and one-to-one interviews of the graduates of 2001-3, veterinarians who had been graduated for 3-10 years and senior veterinarians (owners, managers or senior partners) on the abilities of Massey graduates. This was part of a larger study that also examined issues of recruitment and retention of veterinarians in rural practice in New Zealand.

Questionnaires were received from 64 graduates and 114 employers. In addition, 142 people agreed to participate in interviews/focus groups, of whom 115 were actually interviewed. Of the graduate respondents, 63% were in mixed practice, 22% in large animal practice and 11% in small animal practice. Responses from employers showed that 57% had employed one or more graduates in the previous 3 years; typically these graduates remained in their employment for 1-3 years.

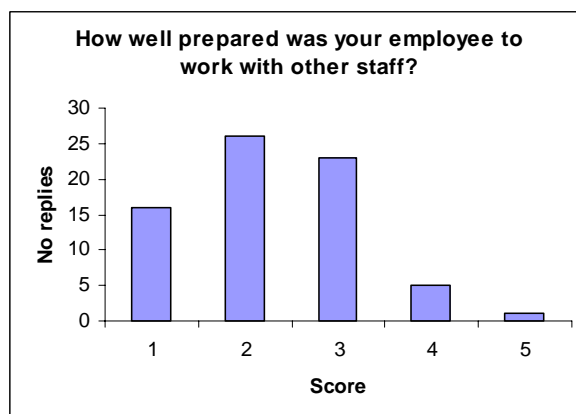
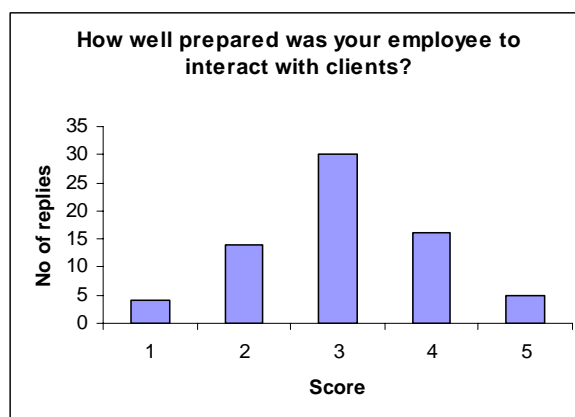
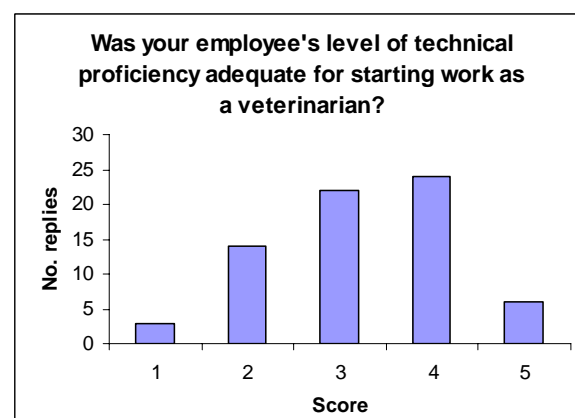
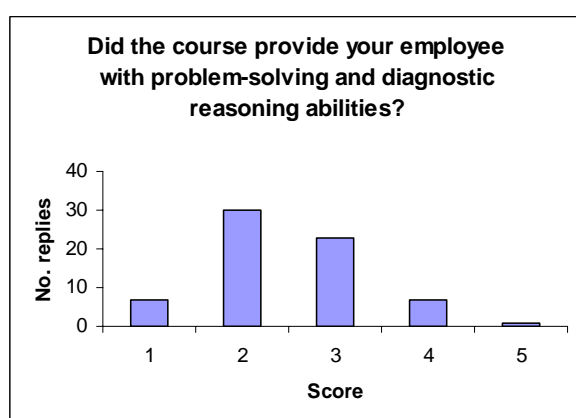
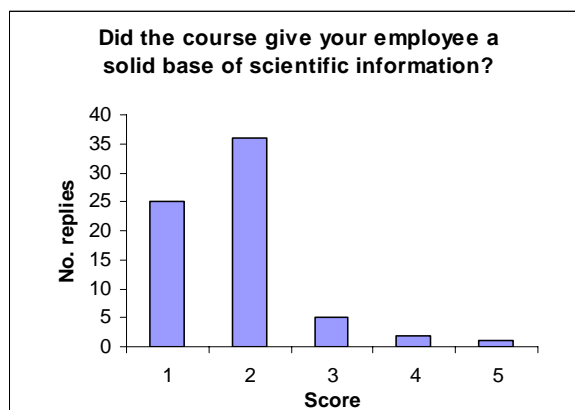
Summary of responses

- The gender ratio of Massey's graduates closely reflects the ratio of those who apply. The dearth of male entrants may reflect perceptions of the profile and/or remuneration of the profession amongst school students, and may reflect inappropriate advice given by career advisors. However, there is little difference between the abilities of female and male graduates to function as veterinarians.
- The programme at Massey was generally regarded as providing a good theoretical grounding for clinical practice. Some weaknesses in technical proficiency were identified; however, the consensus was that it is not feasible for graduates to be technically competent in many areas, but that they should be equipped to develop such competence in their first 1-2 years in practice. A need to teach students how to relate to clients and to have an appreciation of practice as a business was also identified.
- Many students graduate without having a real understanding of what life in rural veterinary practice is really like. Improvements to the 'seeing practice' scheme, in terms of duration, timing and location of placements, could ameliorate this situation. Having students to see practice is also regarded as an important aspect of their recruitment into rural practices, especially those in remote areas.
- Other than in some remote or depressed areas, recruitment into rural practice is not a problem. Most graduates want to start their careers in mixed, rural, practice.
- The first year in practice is a 'make or break' period in a veterinarian's career, especially in terms of the support for the graduate whilst they develop clinical and client skills.
- There can be a tension between the work ethics of principals and of graduates.

Graduates' responses to questions regarding their entry level competencies (1=best, 5=worst)



Employers' responses to questions regarding Massey graduates' entry level competencies (1=best, 5=worst)



It was clear that both graduates and their employers regarded the scientific basis of the degree as good, as 88% of responses from both graduates and employers gave scores of 1 or 2 to this question. Diagnostic and problem-solving skills were more highly regarded by graduates (77% giving scores of 1 or 2) than employers (54% scoring 1 or 2), yet it was regarded as adequate or better by 88% of employer and 94% of graduate respondents. The difference between employers' responses and those of graduates approached, but did not reach, statistical significance ($p=0.1$).

In interviews and in responses to open questions, graduates said that they considered their knowledge base to be good and that they had useful sources of information in their study guides. They considered that they had learnt a 'gold standard' approach to medicine at Massey. However, they found it difficult to translating this information into everyday situations.

Likewise, employers generally rated graduates' knowledge-base highly, often commenting that they were a good source of up-to-date information to themselves. Such negative comments as there were largely focused upon the differences between 'text-book' information and the realities of practice. In terms of diagnostic reasoning and process, some noted that graduates tended to give undue emphasis to esoteric diseases at the expense of common ones. Skills in this area were considered to be better for small animals than for farm animals.

Graduates felt that the problem-orientated approach of clinical teaching was valuable, especially in terms of working through diagnostic pathways rather than just 'spotting' a possible diagnosis. Some graduates experienced tension between this approach and the more intuitive approach used by experienced veterinarians. It should be noted that, in the literature, this dichotomy of approach is universal in medical practice:- graduates work from first principles, experienced clinicians from pattern recognition drawn from their experience.

Technical training was less well regarded by both groups. Similar proportions of employer (44%) and graduate (43%) respondents regarded the technical proficiency of graduates as less than adequate. Curiously, however, 24% of employers gave scores of 1 or 2 (better than adequate) whereas only 13% of graduates did so. This difference between groups again approached, but did not reach, statistical significance ($p=0.1$).

Graduates' comments about their practical skills tended to concentrate upon those in which they considered themselves to be deficient. Pregnancy testing of cattle, lame cattle, small animal surgery and routine/everyday procedures with all species were prominent amongst these. Most graduates recognised that developing proficiency in most areas was a function of the number of times that they had done the procedure. Hence, a supportive work environment was regarded as a vital component of developing skills. Many respondents recognised the constraints that limited the amount of practical experience that they had been able to acquire during their degree programme. However, even increasing practical experience by 'seeing practice' did not compare with the volume of material (and, hence, development of skills) that occurred during the first year in practice.

Employers highlighted similar items. Again, pregnancy testing of cattle, routine large animal procedures and routine small animal surgery were highlighted by those whose comments were negative. On the other hand, small animal surgical skills were specifically mentioned as being good in a substantial number of replies.

Both graduates and employers commented that graduates rapidly become upskilled during their initial period in practice. Employers also noted that, because of the seasonal nature of livestock systems in New Zealand, it took a year for a graduate become competent in working with farm animals (i.e. once they had experienced each season once). For small animals, those

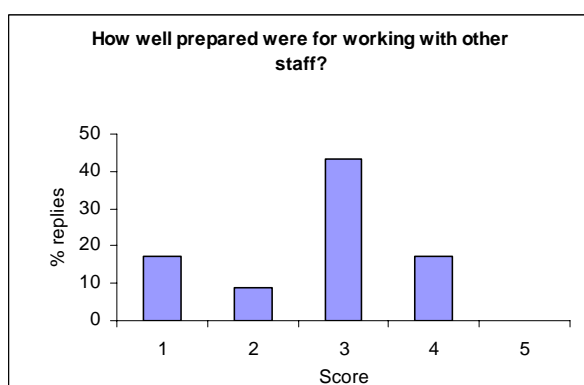
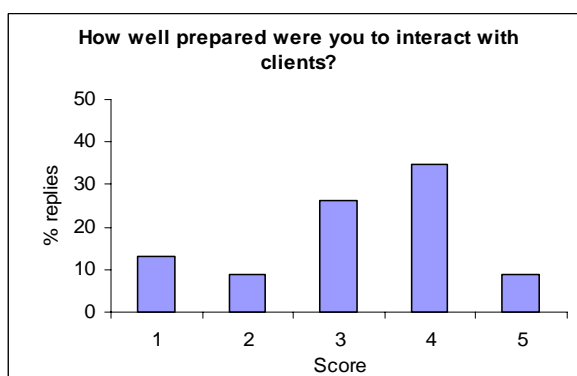
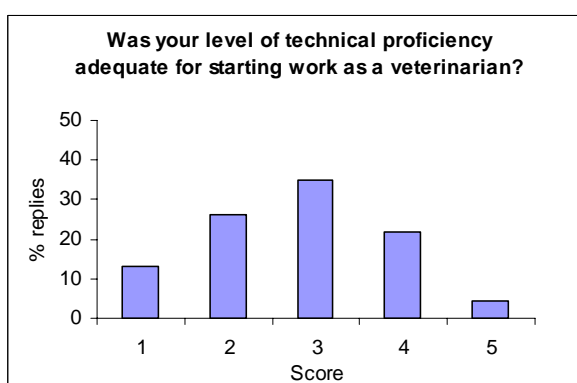
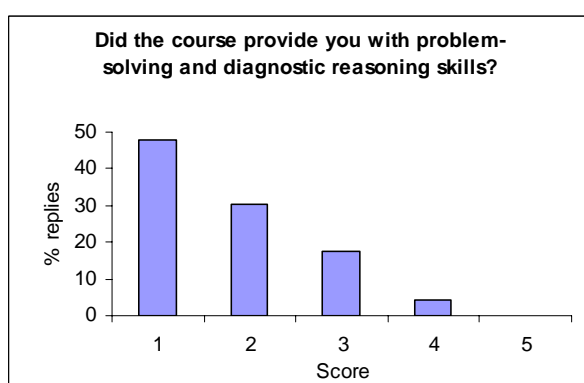
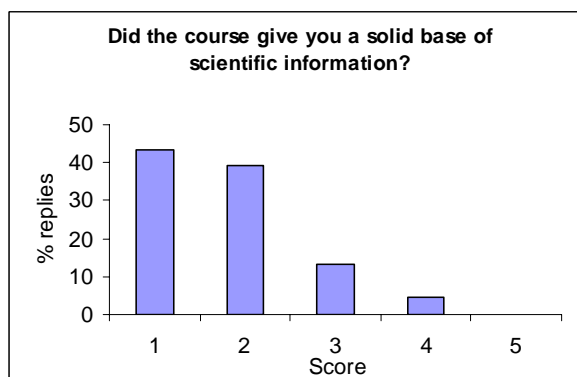
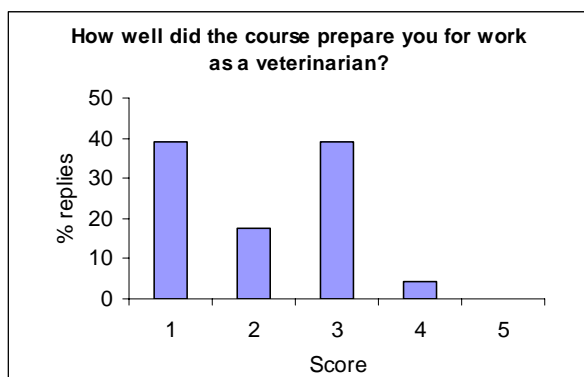
whose work was primarily in that area, development of basic skill required about 6 months, but for those whose work was primarily with large animals, it could be much longer. There was a consensus that by two years after graduation, most common things had been encountered and could be managed successfully. Graduates of 7-10 years standing considered that they were fully competent after about 5 years.

A large proportion of graduates gave scores of 4 or 5 in response to the question about their preparation to interact with clients (55%), of the remainder 32% only scored it as adequate (score 3). Employers were significantly ($P < 0.01$) more lenient in their verdict than were graduates: 30% gave scores of less than adequate (4 or 5), 43% adequate and 26% better than adequate (1 or 2). Most respondents (86% graduates and 92% employers) considered graduates adequately prepared (scores of 1, 2 or 3) for working with other staff.

Managing and handling clients was seen as a demanding aspect of their work by many graduates, but one which they primarily handled from their own resources of personality and attributes rather than from formal teaching during their degree. Several graduates noted that they had acquired such skills as they had in this area from the time they had spent 'seeing practice' or from other experiences that they had had in their lives. Many graduates noted that the change in responsibility between being a student and being a graduate was challenging. Employers noted that it was clear that graduates' ability to relate to clients and to other staff was determined more by the intrinsic personality of the individual, rather than to any training or lack thereof that they had received.

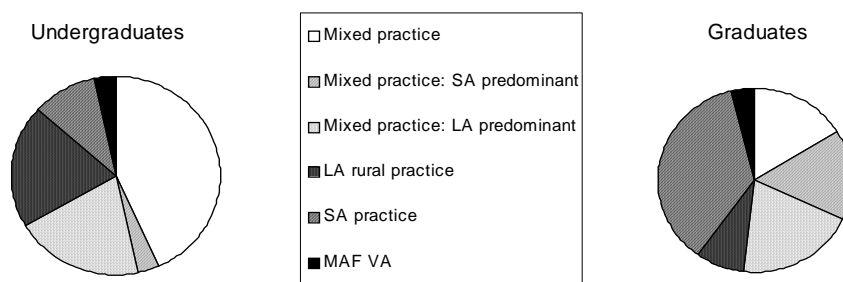
The majority of respondents (88% graduates and 91% of employers) thought that graduates were adequately prepared (scores of 1, 2 or 3) to deal with regulatory, legal and ethical issues. Some employers identified graduates' abilities in the prescribing and documentation of withholding periods for drugs given to production animals as deficient

2. Survey of 2005 Graduates (2006)

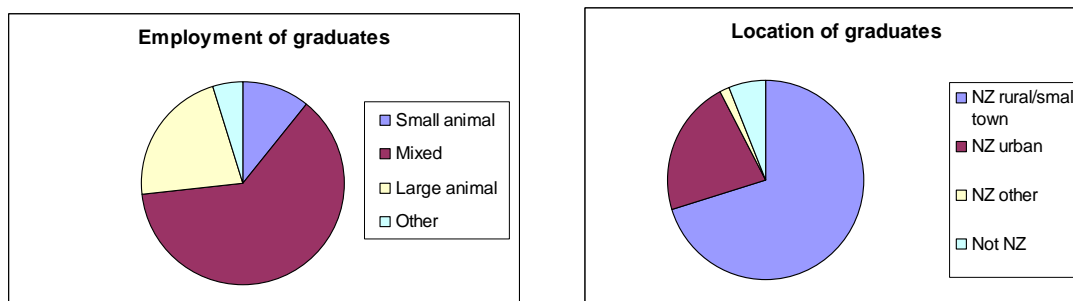


3. Demographics of graduates' employment

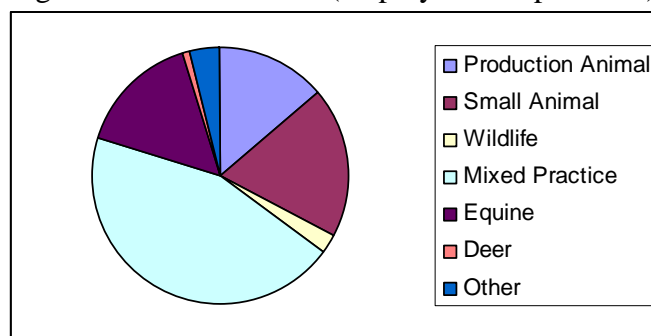
- i. Survey of 2001: 5th year undergraduates (employment aspirations) and 1-year graduates (actual employment)



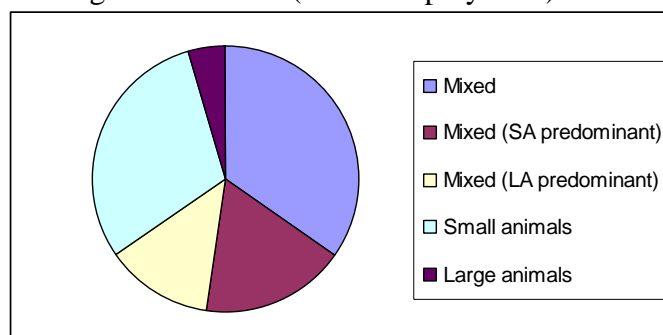
- ii. Survey of 2004 (1-3 year graduates, actual employment)



- iii. Survey of undergraduates 20002-2004 (employment aspirations)



- iv. Survey of graduating class of 2005 (actual employment)



Appendix 12.2

Learning outcomes in the 5th year of the BVSc programme (227.503)	AVMA clinical competency outcomes Section 21.11.3
Display a professional attitude at all times to their work, this includes all interactions with staff within IVABS, while on externship, fellow students, clients and their animals.	8
Demonstrate the practical application of knowledge previously gained in veterinary medicine and surgery, public health, pathology, clinical pathology and the biology of infectious diseases.	1,2,9
Demonstrate expertise in the interpretation and reporting of gross lesions detected during necropsy and be able to relate these to clinical problems.	1,2,
Show skills in the cost-effective use of laboratory tests, diagnostic imaging and other aids to diagnosis and in interpreting results from these.	1
Recognise the signs of disease in domestic animals in general terms and in relation to specific disease entities.	1
Demonstrate understanding of the importance of the control of exotic diseases amongst domestic animals.	7
Be able to institute appropriate therapeutic, treatment and management practices for the prevention and cure of disease.	2,3,4,5,6
Perform routine veterinary medical and surgical procedures (including euthanasia) to a standard of competence that allows them to be registered as practicing veterinarians.	1,3,4,5,6
Demonstrate understanding of the inter-relationships of health and productivity in agricultural animals.	7
Give rational, cost-effective advice on appropriate management practices for livestock production.	2,5,7
Show consideration for the welfare of companion and production animals as an integral part of the management of disease and as an integral part of livestock production systems.	3
Correctly prescribe and dispense therapeutic agents, in accordance with national legislation.	2,5,7,
Utilise problem-solving skills, particularly in relation to diagnostic reasoning.	1,2
Undertake self-directed learning, as undergraduates and thereafter.	9
Have advanced their knowledge in a specific aspect of veterinary science in which they have a particular interest.	9
Interact appropriately with members of the public and colleagues with whom they will, as veterinarians, have contact.	8
Outcomes for specific rosters	
Small Animals	
SA medicine	
Proficiency in client communication; acceptable personal presentation as a professional person.	8
The ability to perform a thorough physical/clinical examination, including appropriate history taking	1
The ability to maintain appropriate patient records	1
Proficiency at rapidly generating an accurate and complete differential diagnoses list for each of a wide range of commonly-encountered clinical problems.	1,2
An understanding of the use of diagnostic aids (including imaging, clinical pathology etc) in the diagnosis of clinical disease.	2
The ability to develop and implement appropriate treatment plans (e.g. the SOAP format).	2
The ability to undertake routine medical, surgical and emergency care of animals	2,5,6
An understanding of the situations in which patients should be referred for specialist care.	2
Acceptable interpersonal skills when working with nursing staff and other veterinarians	8
A personal commitment to the welfare of animals in their care	3

SA surgery	
Be able to take an appropriate clinical history	1
Perform a clinical examination, formulate differential diagnoses and a diagnostic plan.	1,2
Provide primary care and management of hospitalised patients, including post-operative critical care.	2,3,4
Communicating with the owners of patients.	8
Develop a problem oriented approach to case management, by problem identification and problem solving.	1
Develop basic surgical skills viz-. Handling surgical instruments, suturing, performing elective ovariohysterectomies and castrations, by assisting surgical staff in theatre and performing routine surgical procedures under supervision.	4
Build on your academic knowledge of surgery through small group seminars, reviews of scientific articles and case presentations	9
Apply and develop knowledge of diagnostics as it applies to surgical uses.	1,4
Know when to seek specialist opinions over cases	2
Anaesthesia	
Develop protocols for the safe anaesthesia of patients, including taking an appropriate history, performing pre-anaesthetic clinical assessments and monitoring animals during anaesthesia (including use/interpretation of ECGs)	3
Develop protocols for care of critical/emergency patients	3,6
Understand the use of anaesthetic drugs (including pre-medication, analgesia and intra-/post-operative supportive therapy)	3
Care appropriately for animals during recovery from anaesthesia	3,6
Correctly assemble and use breathing circuits	3
Maintain appropriate anaesthetic records	2,3
Imaging	
Use appropriate imaging techniques in diagnosis of disease	1 (4,5)
Develop a plan for imaging methods in the context of patients' clinical histories	2
Correctly interpret findings from diagnostic imaging	1
Use x-ray and other imaging equipment correctly, with due regard for the safety of themselves and others.	1,8
Maintain appropriate patient records	1
Explain the importance of radiation safety monitoring	8
City vets (SA externship)	
Proficiency in client communication, understanding history taking and performing a physical examination.	1,8
Proficiency at rapidly generating an accurate and complete differential diagnoses list for each of a wide range of commonly-encountered clinical problems.	1,2
To understand the day to day operation of a multi-person companion animal practice, including time management skills, client interaction and service delivery.	8
Revise and practice ophthalmic examination of small animal patients.	1,4,5
Observe referral ophthalmic case workup and treatment.	2
Develop interpersonal skills by working with nursing staff and vets in a workplace.	8
Put anaesthesia knowledge and monitoring skills into practice.	3
Put surgical scrub routine into practice and assist or perform (minor) surgery.	5
Farm Animals	
Farm Service Clinic	
Diagnosis and differential diagnosis of disease in individual dairy cows.	1
Management and disease factors affecting herd health and productivity.	5,7
Ability to perform routine investigative and therapeutic procedures including a thorough clinical examination of the cow.	1,2
Safe use of therapeutic substances in food-producing animals.	5,7
Economic consequences of disease.	2,7
Rural Practice Externship	
Understanding how to build professional relationships with farmer clients, including communication at an appropriate level.	8
Understanding of farming as a business'.	7

Professional skills, including organisation, time management, and working routines for when you yourself enter practice.	8
Development of clinical skills with domestic ruminants, including herd health, individual animal medicine and diagnostic methods.	1,2,5 (4)
Developing an understanding of what are feasible and cost-effective outcomes of individual animal and herd-based health problems.	2
Understanding and development of client relationships in the context of rural veterinary practice.	8
Familiarisation with the marketing of veterinary medicines and animal health products.	7 (8)
Developing an understanding of the role of the veterinarian in livestock production businesses.	7 (8)
Animal Health	
To provide all students with a basic understanding of herd/population medicine and its application to farm animal production.	7
To promote understanding of animal health knowledge relevant to farming systems.	3,7
To develop confidence and competence in accessing, retrieving, and using information and applying it to clinical medicine, and animal production and health programmes.	1,2,7
To advance the student's understanding of and confidence with the principles, practice and implementation of herd/population medicine;	7
To gain practical experience in collection and analysis of herd health and productivity data, with an emphasis on problem solving;	1,2,7,8,
develop a practical ability in feed budgeting and management for a range of grazing livestock species.	7
Sheep and beef	
Development of skills in routine diagnostic, clinical and surgical procedures of farm animals	1,2,4,5
Develop of observational skills as they pertain to production animal enterprises	1
Develop appropriate client communication skills	8
Be aware of the role of the large animal veterinarian in preventative medicine and herd health: including the business opportunities that may arise during farm visits.	7
Maintain case records that are appropriate for visits to large-scale farming enterprises	1,7
Equine	
Equine Hospital	
Integrate and expand your knowledge and practical skills in equine medicine, surgery and reproduction. This includes the safe handling of horses.	1 (4,5,6)
Be able to take a detailed history, and perform a thorough physical examination, simple diagnostic tests and treatments on primary and referred medical and surgical cases in the Massey University Large Animal Hospital. This includes developing an understanding of when it is appropriate to refer cases for specialist care.	1,2
Be able to develop differential diagnosis lists and treatment plans.	2
Be able to care for critical patients (eg. post-colic surgery).	3
Communicate appropriately with clients, grooms/nurses and other veterinarians; present yourself appropriately as a professional person.	8
Know how to obtain and verify the validity of information pertaining to equine medicine, surgery and reproduction.	9
Equine externship	
Integrate and expand your knowledge and practical skills in equine medicine, surgery and reproduction.	1 (4,5,6)
Taking a detailed history, and performing a thorough physical examination	1
Diagnostic tests and treatments of primary and referred medical, surgical and reproduction cases.	1,2,4,5,6
Communicate appropriately with clients, grooms/nurses and other veterinarians; present yourself appropriately as a professional person.	8
Know how to obtain and verify the validity of information pertaining to equine medicine, surgery and reproduction.	9
Miscellaneous	
Composite roster	
To promote the practical application of knowledge gained previously in public health,	1,3,5,7

pathology, clinical pathology, microbiology, pharmacology and parasitology.	
To revise and extend skills in medicine, surgery, anaesthesia and imaging.	3,4,5
To develop skills in the cost effective use of laboratory tests and in the interpretation of laboratory results.	1,2
Clinical and Diagnostic Pathology	
Develop your expertise in performing a necropsy, interpreting and describing gross lesions and relating them to clinical problems	1,4,5
Develop your skills in the cost-effective use of lab tests and in the interpretation of results	1,2, (4, 5, 6)
Develop methods for maintain records of anatomic and clinical pathology findings	1
Develop your understanding of the relationships between pathology, clinical pathology and the presentation, treatment and prognosis of clinical disease	1,4,5,9
Extramural studies (seeing practice)	
To gain an appreciation of the business and management of the veterinary practice	8
how the services are marketed	8
how the practices deal with client enquiries	8
how after-hour services are provided	6,8
how new clients and drug representatives are dealt with	8
how drugs are ordered and dispensed.	7,8
To develop your skills in dealing with the public and clients: how you, as a professional person, should interact with clients.	8
The opportunity to increase and improve your technical and clinical skills (e.g. conducting clinical examinations, reaching diagnoses instigating appropriate therapy, giving advice).	1,2,3,4,5,6

227.501: Veterinary Professional Studies	
Describe and demonstrate an understanding of the ethical framework in which veterinarians operate within various veterinary endeavours.	8
Show understanding of the Veterinarians Act (2005) and the role of the Code of Professional Conduct for Veterinarians.	8
Show an understanding of the legislative process and laws that pertain particularly to the veterinary profession.	8
Show an understanding of business methods and management.	8
Recognise veterinary organisations operating in New Zealand and elsewhere and show an understanding of their roles.	8
Show communication skills and strategies appropriate for veterinarians.	8
Demonstrate awareness of influences on physical and mental fitness and knowledge of strategies for their maintenance.	8

227.502 Veterinary Public Health, Food Safety & Quality Management	
The range of roles and responsibilities of veterinarians pertaining to public health.	7
Epidemiological and ecological principles relevant to veterinary public health.	7,9
Important zoonotic diseases in New Zealand and internationally, including emerging diseases.	7
Major microbial, chemical and physical hazards associated with animal products.	1,7
The application of quality assurance principles to ensure adequate safety of animal products, particularly meat.	7
Factors affecting meat quality and meat hygiene.	7,9
The structure and operations of New Zealand's meat industries and key issues affecting them.	(7)
Animal welfare aspects related to animal transport, lairage and slaughter procedures.	3,7
The impact of animal industries on the environment.	(7)
National and international regulatory approaches to controlling foodborne hazards.	7
Public health issues and biotechnology	7,9