Visitation to the University of Cambridge Department of Veterinary Medicine

12-16 March 2018

Report to the Council of the Royal College of Veterinary Surgeons (RCVS) in accordance with Section 5 of the Veterinary Surgeons Act 1966

CONTENTS

List of Visitors

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Also present

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Senior Education Officer, RCVS

Introduction

1. This report is prepared for the RCVS in accordance with the provisions of Section 5(1) of the Veterinary Surgeons Act 1966, "*for the purpose of securing that the courses of study to be followed by students training to be veterinary surgeons and the standard of proficiency required for registration in the register shall be such as sufficiently to guarantee that persons registered in the register will have acquired the knowledge and skill needed for the efficient practice of veterinary surgery*".

2. The visit was conducted in accordance with the procedures set out in the "RCVS standards and procedures for the accreditation of veterinary degrees", May 2016 edition.

3. The Visitors were present at the University from 12 - 16 March 2018 inclusive, having attended a briefing session for Visitors on Sunday 11 March. A self-assessment document was prepared by the Department and provided to the Visitors two months before the visit. The Visitors were also given access to a well organised repository of supporting documents including examination papers, external examiners' reports, committee records, course material, staff CPD records, as well as access to the university intranet.

4. The Visitors toured the facilities in the Department of Veterinary Medicine, including the various pre-clinical departments in the Faculty of Biology and the University Farm, and stayed together as a group for the majority of the meetings with staff and students.

5. The Visitors met with the Senior Pro-Vice Chancellor of the University, Professor Duncan Maskell on the first and final days of the visit, and gave a summary of their main findings and advance notice of the recommendations that would be passed to RCVS.

6. The Visitors are grateful to the Head of Veterinary School, Professor James Wood, and all the staff in the Department for their help and hospitality during the visit. The Visitors are aware of the considerable amount of work and time that is taken up by these visitations, and thank the staff from the various Departments who made themselves available. The Visitors would also like to thank the employers and alumni who attended the meetings and the undergraduate and postgraduate students who met with the Visitors each day to talk about the experience of studying at Cambridge. The Visitors commend the University on the quality, commitment and motivation of its veterinary students, including postgraduates, interns and residents. Their contribution to the visit was most important.

Summary of the Visitors' findings

Standard 1 – Organisation

Recommendations

1.   The Department must proceed with the development of its operating plan, implement it and report on progress in achievement of its goals as part of the RCVS annual monitoring process.

Standard 2 – Finances

There were no recommendations or suggestions.

Standard 3 – Physical Facilities

Suggestions

2.   The scheduled improvement to Lecture Theatre 1 should be actioned and Lecture Theatre 2 should have improvements and expansion of its electrical supply to improve IT provision to the students.

3.   Attention should be given to ensuring that supporting documents for Health & Safety, biosecurity and welfare standards demonstrate evidence of regular review.

Standard 4 – Animal Resources

Suggestions

4.   Field postmortem examinations and those undertaken by clinicians as part of other rotations should be recorded in the collation of figures for post mortem examinations when seen or carried out by students.

5.   The department should plan for additional sources of dairy cattle for undergraduate study.

Standard 5 – Information Resources

There were no recommendations or suggestions.

Standard 6 – Students

Commendations

6.   The support of students is commended.

Standard 7 – Admission & Progression

Commendations

7.   The collegiate structure and its support of students' welfare and professional progression is commended.

Standard 8 – Academic & Support Staff

8.   There is a strong emphasis on research outputs for academic progression. It is suggested that the Head of Department continues to work within the University to provide a stronger emphasis on consideration of teaching and clinical activities in progression pathways.

Standard 9 – Curriculum

Recommendations

9.   The Department must complete its planned curriculum review and move from the use of 'aims and objectives' to unambiguous learning outcomes at all levels of the Programme**.**

10**.**   A cohesive framework of learning outcomes must be communicated to staff and students and underpin the constructive alignment of all content, teaching, learning and assessment activities of the degree Programme and individual units of study to the Royal College of Veterinary Surgeons Day One Competences.

11.   Progress on the above must be reported as part of the RCVS annual monitoring process.

Standard 10 – Assessment

Recommendations

12.   The Department must complete its assessment review and instigate a cohesive programme-wide assessment strategy that clearly articulates the relationship between the learning outcomes of the programme and the modes of assessment.

13.   The assessment strategy (Standard 10, paragraph 10.22) must ensure that direct assessment of clinical skills forms a significant component of the overall assessment in the clinical disciplines and contributes to the final grade awarded.

14.   Progress with the above recommendations must be reported as part of the RCVS annual monitoring process.

Standard 11 – Research Programmes, Continuing & Higher Degrees

Commendations

15.   The Year three study and in particular its research projects and dissertations is commended.

Standard 12 – Outcomes Assessment

Recommendations

16.   The Department must implement its plans for curricular and examination review and a quality management system for its activities, then report on the progress in doing this as part of the RCVS annual monitoring process.
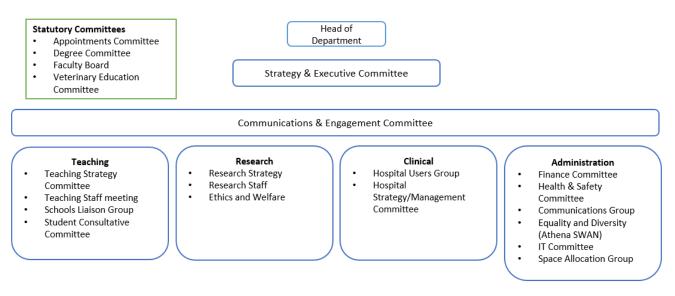
Standard 1 – Organisation

Background

1.1. The mission of the Department of Veterinary Medicine is "*To deliver excellence in veterinary education and biomedical research, and to address the challenges to the health and welfare of animals, humans and the environment in the 21st century*".

1.2 The Department's mission and related objectives are included in its 5 year rolling Strategic Plan, which is prepared and revised annually by the Department's Senior Management team, the Strategy and Executive Committee. This plan is widely communicated internally, and is available on the intranet and presented at Communications and Engagement Committee (CEC) and the Council of the School of Biological Sciences.

Figure 1a: Diagram of the internal administrative structure of the Department

1.3. The committee structure in the Department is subject to periodic review by the Head of Department and the Strategy and Executive Committee, and has been revised twice since the last RCVS visitation. The aim of the committee structure is to facilitate and encourage best practice, and to encourage wide participation by internal stakeholders.

1.4.   The structure of committees and consultative groups in the Department provides a mechanism for staff and students to influence the Department's direction and decision-making through direct participation. Membership of committees and working groups is spread across a wide range of individuals, which ensures breadth of engagement and participation. Opportunities to volunteer for service on committees are advertised by email around the Department. Students elect their own representatives. There are further opportunities for consultation, such as the Head of Department's biannual briefings, and one-off consultations on specific topics. The Communication & Engagement Committee provides a forum for consultation about major issues and strategy. The Teaching Strategy Committee (including students), Hospital Strategy Committee and Research Strategy Committee consider future directions of activities; these committees report to Strategy and Executive Committee, the senior committee of the Department. Minutes of committee and group meetings are published on the intranet section of the Department website.

1.5.   The Head of Department is responsible for the clinical teaching hospital. He is supported in this role by the Dean, who chairs the Hospital Strategy Committee and the Hospital Management Committee.

1.6.   The Department's Strategy and Executive Committee annually updates its Risk Register; this is then signed off by the School of Biological Sciences (SBS). The identification of key risks to the programme allows development of specific strategies to mitigate each risk. Examples of specific risks to the veterinary programme include those that cross rather different time frames. They include those relating to veterinary course application numbers in Cambridge, ensuring recruitment and retention of key personnel, particularly clinical personnel, risks from a failure to develop or maintain the estate and risks if clinical caseload available for teaching were to reduce. Each risk has a specific action and time-line. A measure of the effectiveness of the process can be judged from the response to falling student application numbers; a new Admissions Strategy Committee was created, which worked across the Collegiate University to address specific issues in University processes. Key changes delivered through this strategy included splitting the governance of the medical and veterinary pre-clinical courses which in turn allowed the standard A level grade requirements to be reduced for the veterinary course, and a more bespoke web and social media presence. Application numbers increased by 45% in 2017.

Comments

1.7.   The Department has a strategic plan and provided evidence that it is in the process of developing an operating plan to support its delivery. The Head of Department reported that Cambridge University does not have an expectation of "SMART" outcomes for its departments. The Department meets all other aspects of the Organisation standard.

Suggestions

None

Recommendations

1.8.   The Department must proceed with the development of its operating plan, implement it and report on progress in achievement of its goals as part of the RCVS annual monitoring process.

Standard 2 – Finances

> **2.1**   *Finances must be demonstrably adequate to sustain the educational programmes and the requirements for the school to meet its mission.*
>
> **2.2**   *Schools with other veterinary-related professional and non-professional (eg. veterinary nursing, animal science) undergraduate degree programmes must clearly report finances (expenditures and revenues) specific to those programmes separately from finances (expenditures and revenues) dedicated to all other educational programmes.*
>
> **2.3**   *Resources allocation must be regularly reviewed to ensure it meets the requirements for accreditation of the professional veterinary degree.*
>
> **2.4**   *Clinical services, field services, and teaching hospitals must function as instructional resources. Instructional integrity of these resources must take priority over financial self-sufficiency of clinical services operations. Clinics must be run as efficiently as possible, for example with transparent business plans, in order to set an example of good business practice for students.*

Background

2.1.   The Department receives and manages an annual allocation from the Higher Education Funding Council (HEFCE), known as the Chest Budget, against which direct pay and non-pay costs are met. This base-line budget is set on an historical basis against the established activity of the Department and is typically inflated annually. The budget provided each year is to cover the:

- Costs of agreed cohort of academic posts, at whatever level individuals are promoted to
- Costs of the agreed cohort of support posts
- Cash-based non-pay budget

2.2.   The Department is expected to manage the local direct costs of its teaching and research activities via the Chest funding devolved to it via the School of the Biological Sciences (SBS). Where changes to teaching activities are planned that would have significant impacts on (future) income, the Department and School can bid for additional Chest resource via the annual General Board Strategic Planning exercise.

2.3.   In addition to direct cash support, the University meets all indirect costs of the Department. Infrastructure services (buildings, planned maintenance, utilities and central services, e.g. insurance, payroll & pensions administration, human resources, central IT, central libraries) are provided as a core service across the University and are funded via a top slice from the income received by the University centrally.

2.4.   Whilst the total cost of training reflects the costs incurred through the Department, an important consideration is that the preclinical veterinary course is taught by a number of Departments across the School:

- Pre-clinical years are taught primarily by biological sciences departments. Students study the Medical and Veterinary Sciences Tripos, some aspects of which are co-taught with medical and/or with Natural Sciences Tripos students.
- The thirrd year (Tripos Part II) can be based in any biological sciences department or certain other Departments. The clinical years are the responsibility of the Department of Veterinary Medicine

2.5. The funding for teaching for the veterinary course (which is driven by student FTE) is distributed (to pay direct and indirect costs) to various Departments in proportion to their contribution to the teaching activities; thus the public funding for the teaching of veterinary students is distributed to Biochemistry, Pathology, Pharmacology, and Physiology Development & Neuroscience Departments as well as Veterinary Medicine.

Table 2a: Annual expenditure of the Department **for the last 5 years**

Area of Expenditure	15-16	14-15	13-14	12-13	11-12
	£,000	£,000	£,000	£,000	£,000
a. Personnel					
a.1 teaching staff	3,224	2,763	2,636	2,497	2,497
a.2 support staff	3,610	3,814	3,378	3,322	2,908
a.3 research staff	1,529	1,895	2,143	2,320	1,977
Total for a	8,363	8,471	8,157	8,140	7,383
b. Operating Costs					
b.1 utilities					
b.2 expenditure relating specifically to teaching	3,437	3,219	2,911	2,301	1,994
b.3 expenditure relating specifically to research	2,089	1,552	1,670	1,874	1,510
b.4 general operations (excluding the above)					
Total for b	5,526	4,772	4,582	4,175	3,504
c. Equipment					
c.1 teaching	490	510	501	443	438
c.2 research	172	91	42	68	37
c.3 general (or common) equipment					
Total for c	*662*	*600*	*543*	*511*	*475*
d. Maintenance of buildings					
e. *Total expenditure*	14,550	13,843	13,281	12,825	11,362

Table 2b: Projected future expenditure of the Department for the next 5 years

Area of Expenditure	15-16	16-17	17-18	18-19	19-20
	£,000	£,000	£,000	£,000	£,000
a. Personnel					
a.1 teaching staff	3,224	3,289	3,355	3,422	3,490
a.2 support staff	3,610	3,682	3,755	3,830	3,907
a.3 research staff	1,529	1,559	1,590	1,622	1,655
Total for a	8,363	8,530	8,700	8,874	9,052
b. Operating Costs					
b.1 utilities	0	0	0	0	0
b.2 expenditure relating specifically to teaching	3,437	3,471	3,506	3,541	3,576
b.3 expenditure relating specifically to research	2,089	2,110	2,131	2,152	2,174
b.4 general operations (excluding the above)	0	0	0	0	0

Total for b	5,526	5,581	5,637	5,693	5,750
c. Equipment					
c.1 teaching	490	495	499	504	510
c.2 research	172	174	176	177	179
c.3 general (or common) equipment	0	0	0	0	0
Total for c	662	668	675	682	689
d. Maintenance of buildings	0	0	0	0	0
e. Total expenditure	14,550	14,779	15,012	15,249	15,490

The central costs paid by the University on behalf of the Department include: utilities, insurance, academic services and building maintenance. In total for 2015-16 this equated to another £7m, £3.1m of which was apportioned to teaching activity (c.20% of direct activity). In line with University Guidelines, projections assume a 2% increase on pay and 1% non-pay.

Table 2c: Sources of expenditure for the veterinary teaching hospital for the last 5 years

Costs	15-16	14-15	13-14	12-13	11-12
	£'000	£'000	£'000	£'000	£'000
1. Salaries for support staff*	2,214	2,205	2,005	1,961	1,661
2. Salaries for teaching staff	545	415	332	360	455
3. Maintenance of buildings and equipment	151	142	108	99	101
4. Costs of consumable items, drugs, etc. incl. stock carried in-house	1,774	1,717	1,710	1,366	1,041
5. Equipment costs & depreciation	437	469	418	347	417
6. Costs of maintaining teaching animals	N/A				

Table 2d: Projected expenditure for the veterinary teaching hospital in next 5 years

Costs	15-16	16-17	17-18	18-19	19-20
	£'000	£'000	£'000	£'000	£'000
1. Salaries for support staff	2,214	2,259	2,304	2,350	2,397
2. Salaries for teaching staff	545	555	567	578	589
3. Maintenance of buildings and equipment	151	153	154	156	157
4. Costs of consumable items, drugs, etc. incl. stock carried in house	1,774	1,792	1,810	1,828	1,846
5. Equipment costs & depreciation	437	441	446	450	455
6. Costs of maintaining teaching animals	N/A				

*'Teaching Staff' includes only staff with an academic contract. 'Support Staff' includes clinical staff.

Table 2e: Cost of veterinary training for the last 5 years

1. Annual cost of training a veterinary student	15-16	14-15	13-14	12-13	11-12
	£'000	£'000	£'000	£'000	£'000
	55.66	51.53	44.39	40.00	38.23

Table 2f: Annual revenues of the Department for the last 5 years

| Revenue Source | 15-16 | 14-15 | 13-14 | 12-13 | 11-12 |
	£,000	£,000	£,000	£,000	£,000
a. revenue from the State or public authority	3,622	3,850	2,618	3,194	3,717
b. revenue from private bodies	334	383	330	264	224
c. revenue from research	3,789	3,537	3,855	4,262	3,524
d. revenue earned & retained by the school					
d.1 registration/tuition fees from students					
domestic students	1,613	1,216	1,909	1,253	935
international students	144	133	237	203	201
d.2 revenue from continuing education					
d.3 revenue from clinical activities	3,800	3,350	3,188	2,908	2,735
d.4 revenue from diagnostic activities					
e. revenue from other sources	911	1,254	2,026	1,065	1,194
f. *Total revenue from all sources*	*14,212*	*13,723*	*14,162*	*13,149*	*12,530*

Table 2g: Projected future revenues of the Department for the next 5 years

| Revenue Source | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 |
	£'000	£'000	£'000	£'000	£'000
a. revenue from the State or public authority	3,622	3,658	3,694	3,731	3,769
b. revenue from private bodies	334	338	341	344	348
c. revenue from research	3,789	3,843	3,897	3,951	4,007
d. revenue earned & retained by the school					
d.1 registration/tuition fees from students					
domestic students	1,613	1,629	1,645	1,662	1,678
international students	144	146	147	149	150
d.2 revenue from continuing education					
d.3 revenue from clinical activities*	3,800	3,876	3,953	4,032	4,113
d.4 revenue from diagnostic activities					
e. revenue from other sources	911	920	929	938	948
f. *Total revenue from all sources*	14,212	14,408	14,606	14,808	15,012

*Includes all revenue for clinical and diagnostic activity

The Department receives a central income equivalent to a+d1 in Table 2g. It does not specifically receive its fee income (d1) as a separate stream, but those figures are shown here for information. In addition, central funds are used to meet the c.£7m of central costs mentioned above

Table 2h: Sources of revenue for the veterinary teaching hospital for the last 5 years

Income sources	15-16 £'000	14-15 £'000	13-14 £'000	12-13 £'000	11-12 £'000
1. Core funds from University	1,321	1,251	1,234	1,189	1,150
2. Income from business activities	3,800	3,350	3,188	2,908	2,735
3. Sponsorship from industry					
4. Benefaction and donations	79	48	20	11	12
5. Grants for equipment					

Table 2i: Projected revenues for the veterinary teaching hospital for the next 5 years

Income sources	15-16 £'000	16-17 £'000	17-18 £'000	18-19 £'000	19-20 £'000
1. Core funds from University	1,321	1,334	1,347	1,361	1,375
2. Income from business activities	3,800	3,838	3,876	3,915	3,954
3. Sponsorship from industry					
4. Benefaction and donations	79	80	81	82	82
5. Grants for equipment					

2.6. The Hospital retains all clinical income (as detailed in Table 2h). The University subsidises the activity by meeting all the associated overhead costs. The Department is able to retain all of the income from commercial consulting. After 100% of direct costs are met, the Department is able to retain 20% of any remaining funding from research grants towards overheads. In 2015-16 this was £103k.

2.7. The funding of all Departments in the University of Cambridge is reviewed annually as part of the Strategic Planning exercise. Because of cross Department and College teaching, accurate weightings of funding by student load are not possible. However, the comparably higher cost of teaching clinical veterinary students is taken into account in this exercise.

2.8. Within the Department, local budgets for running costs, equipment and student EMS support are managed at the discretion of the Head of Department through the Strategy and Executive Committee and the Finance Committee.

2.9. Departmental income from other sources, i.e. from clinical and diagnostic services, and any other income (e.g. donations for student prizes or Hospital purposes) is managed at the discretion of the Head of Department, through the Strategy and Executive Committee or the Hospital Management Committee.

2.10. There are different funding mechanisms for major equipment and its replacement depending on the value and type of item required. Funding is held at various levels of the University's governance structure for needs of different magnitude:

- For large items (>£1m) funding is held at University level, managed by the Resource Management Committee.

- SBS administers a fund of *c.*£1m p.a. intended for infrastructural equipment items (>£50k, annual competitive bidding) and for the matching requirements of research sponsors
- Smaller items may be funded through an allocation made annually to the Department (currently c. £55K), or by other funds in the Department (e.g. research overheads, donations, or from Veterinary Teaching Hospital income, for use in the Hospital).

2.11   Within the Department, the Strategy and Executive (S&E) Committee delegates responsibility to the Research Strategy Committee for putting forward central bids for major research equipment. It delegates responsibility to the Hospital Management Committee for putting forward bids for Hospital equipment. S&E top slices the annual £55K equipment allocation for computing and health and safety needs, then requests bids for items of small equipment. In practice, funds are mainly used for teaching-related purposes. The Veterinary School Trust provides a regular stream of donation funding for the purchase of equipment for the Veterinary Teaching Hospital and the Clinical Skills Centre. The Department has also had success, often through the Veterinary School Trust, in securing charitable funding for building projects.

2.12   The University's Estate Management (EM) holds a central budget for building maintenance, and has a rolling plan for improvements. This is managed through the Department's Facilities Manager in negotiation with EM. Certain items, e.g. painting, are carried out as part of the rolling improvement plan; urgent matters e.g. collapsed drains, receive attention as they arise; special requests from the Department, e.g. surfacing of car park areas, are prioritised subject to annual budget constraints.

2.13   Fees for students who commenced in 2015/16 were £9,000 for Home/EU and £22,674 for Overseas. These contribute to University central income against which the cost allocations are made. As in the tables, the fees generated by student FTE are supplemented by the University to meet the cost of teaching. Of the £9,000 fees, 50% is distributed to the Colleges for their contribution to student (pastoral) support and small group teaching.

Comments

2.14.   The team thoroughly investigated the finances of the Department of Veterinary Medicine and found that the Department satisfies all aspects of the Finances standard.

Suggestions

None

Recommendations

None

Standard 3 – Facilities and equipment

3.1   All aspects of the physical facilities must provide an environment conducive to learning.

3.2   The veterinary school must have a clear strategy and programme for maintaining and upgrading its buildings and equipment.

3.3   Lecture theatres, teaching laboratories, tutorial rooms, clinical facilities and other teaching spaces must be adequate in number and size, and equipped for the instructional purposes and must be well maintained. Students must have ready access to adequate study, recreation, locker and food services facilities.

3.4   Offices, teaching preparation and research laboratories must be sufficient for the needs of the academic and support staff.

3.5   Facilities must comply with all relevant jurisdictional legislation including health, safety, biosecurity and UK animal welfare and care standards.

3.6   The institutions' livestock facilities, animal housing, core clinical teaching facilities and equipment must:
- *be sufficient in capacity*
- *be of a high standard and well maintained*
- *be fit for purpose*
- *promote best husbandry, welfare and management practices*
- *ensure relevant biosecurity and bio-containment*
- *be designed to enhance learning.*

Clinical teaching facilities

3.7   Core clinical teaching facilities may be provided on campus and/or externally through a 'distributed' model. The school must ensure any hospitals and practices involved with core teaching must meet the relevant RCVS Practice Standards and (for UK schools) be accredited under the RCVS Practice Standards Scheme or to the relevant standard for the teaching undertaken at the establishment.

3.8   All core teaching sites (whether on campus or external) should provide adequate learning spaces including adequate internet access.

3.9   The School must ensure students have access to a broad range of diagnostic and therapeutic facilities, including but not limited to: pharmacy, diagnostic imaging, anaesthesia, clinical pathology, intensive/critical care, surgeries and treatment facilities, ambulatory services and necropsy facilities.

3.10 Operational policies and procedures must be posted for staff, visitors and students.

3.11 Appropriate isolation facilities must be provided to meet the need for the isolation and containment of animals with communicable diseases and operated to provide for animal care in accordance with accepted modern methods for prevention of spread of infectious agents.

Background

3.1.   The physical and human resources that underpin the veterinary course reflect its division into preclinical and clinical education. The preclinical course is delivered in lecture theatres and laboratories in the Departments responsible for preclinical teaching, located within the University's New Museums and Downing Sites.

3.2.   The resources available to students reflect the University's collegiate structure: for example, the Colleges provide their own student computing and library facilities, social spaces and recreational facilities. The University provides facilities over and above those provided by Departments and Colleges, such as access to the University Library, which receives a copy of every text published in the UK, and University sports facilities.

3.3. The Department is based on a single site in West Cambridge, around 1.5 miles from the preclinical Departments, and comprises 16 separate buildings. These buildings have been modified and refurbished over the years to meet the changing educational and scientific needs of the Department. The facilities are constantly upgraded, under a systematic rolling programme of maintenance funded by the University. There are areas of deficiency; refurbishment of Lecture Theatre 1 was identified as a priority in the 2015 Visitation Self-Assessment Report and Lecture Theatre 2 requires refurbishment. Other areas are in need of renovation but the majority of facilities are in excellent condition, including the new hospital facilities and Clinical Skills Centre, both opened in January 2015.

3.4. The main building of the Department incorporates the Queen's Veterinary School Hospital. Research laboratories are housed within the main building and in separate buildings around the site. Most of the required teaching facilities are located on site, with the exception of Cambridge University Farm, located approximately 3 miles from the Department (journey time 10 minutes); the College of West Anglia at Milton, 4 miles from the Department (journey time 15 minutes); the RSPCA first opinion clinic and Blue Cross, which are located respectively 4 miles and 3 miles from the Department (journey times 15-20 minutes); and abattoir and food hygiene facilities, which are provided through commercial companies on a number of sites within 1-2 hours journey time.

3.5. The post-mortem facilities provide dedicated large and small animal necropsy rooms with viewing facilities, perfusion room, photography room, sterilisation room and laundry. An adjacent pathology cut up room contains safety cabinets and specimen storage facilities. The post-mortem suite is accessed through changing and shower facilities, and has a technician's office with separate changing facilities. There are computer links to the pathology database, with equipment for digital photograph capture and storage.

3.6. Since 2015, the Department has continued a programme of building and refurbishment in order to provide and house specialist research, Hospital and teaching facilities and equipment. Over the past 3 years, the upgrading programme has included refurbishment of the Equine Diagnostic Unit and Hickman Equine Surgery Building (completion 2016); further upgrading of Category 3 research laboratories to include a FACS facility (2016); refurbishment of existing underused buildings to provide clinical research facilities for orthopaedic research (Surgical Discovery Unit, 2016); refurbishment of infection & immunity laboratory, funded by the Royal Society Wolfson Refurbishment Scheme (Coombs-Wolfson Laboratory, 2016), refurbishment and consolidation of administration offices support the Department's activities (2015-2017), and refurbishment of laboratories to house the biomineral research group funded by the Medical Research Council (2017).

3.7. Health and Safety measures for all premises used for learning and teaching are overseen by local Safety Officers and the Department's Health and Safety Committee. Standard Operating Procedures are in place for all clinical and research activities; Risk Assessments must be completed before any practical teaching session is delivered.

3.8. The Student Resources Centre provides clean and dirty changing areas with individual lockers, toilet and shower facilities on the ground floor, and a social area, kitchen facilities, quiet work area and further toilet facilities on the first floor.

3.9.   A newly moved staff tea room provides coffee/tea making facilities and microwaves for warming pre-prepared food, and there are several smaller rooms available to staff. Vending machines are available to staff and students. Food facilities for staff and students are available across the West Cambridge Site (West Café, Gates Building, Aristo's, Cavendish Laboratories and a variety of street café outlets). Extensive food outlets are available in central Cambridge for pre-clinical students, in addition to Departmental coffee rooms (for staff) and College cafeterias (staff and students).

3.10.   Sports facilities are available on the West Cambridge Site in the University Sports Centre (opened 2014), with discounted membership rates for students and staff.

Premises used for theoretical, practical and supervised teaching

Table 3a: Premises for lecturing

Within the Department of Veterinary Medicine:

Number of rooms for lecturing	2
Number of places per room:	
Lecture Theatre 1 (predominantly used for 4th year teaching)	116
Lecture Theatre 2 (predominantly used for 5th year teaching)	86

(NB Pre-clinical lectures are mostly given in lecture theatres in central Cambridge)

Table 3b: Premises for group work

Number of rooms for group work by students	10
Number of places per room:	
Main Meeting Room	23
Seminar Room 1	16
Seminar Room 2	25
Seminar Room 3	25
Dr Lee Multimedia Teaching Laboratory	35
Peter Jackson Building seminar room	16
Equine Diagnostic Unit seminar room	16
Hammond Building Seminar Room	15
Small Animal Wing	20
Seminar Room at the University Farm	25

Table 3c: Premises for practical work

Number of rooms for group work by students	6
Number of places per room:	
Clinical pathology work by students, with facility for projecting microscope slides	10
Post-Mortem facilities, with two areas for teaching, each with a viewing area	30
Teaching laboratory	65
Clinical Skills Centre	
Main laboratory (including haptic device)	40
Radiography / Ultrasound room	10

NB: There are large laboratory facilities in pre-clinical departments for teaching in 1st and 2nd year (e.g. Departments of Biochemistry, Pathology, Pharmacology, Physiology, Development and Neuroscience, including an anatomy dissection room (70 students), museum and library.

3.11. The Department owns 10 horses and 2 cows that it keeps on site for teaching purposes, using a combination of grazing, a (new) field shelter and stabling at Merton Hall Farm, which is an American barn facility. The Department also has free access to the University's 240 cow dairy farm, 3 miles distant at Madingley, where a flock of 230 breeding ewes are kept; both are maintained solely for veterinary teaching. Teaching of animal husbandry, production animal health and handling of production animals is taught on-site at the Department, on the University Farm and at the College of West Anglia at Milton, where some practical components of the Principles of Animal Management course and 4th and 5th Year clinical methods teaching are provided, the latter through access to their range of exotic animal species and pig herd.

3.12. The clinical teaching programme is delivered through the clinics of the Queen's Veterinary School Hospital which include:

- QVSH (Small Animal) Referral Hospital
- Cambridge Equine Clinic
- Cambridge Farm Practice
- RSPCA clinic, Pool Way, Cambridge
- Blue Cross cat rehoming centre, Cambridge

3.13. The small animal teaching facilities of the QVSH provide custom-built wards for dogs and cats with associated examination, preparation and teaching areas, and a fully equipped intensive care unit for critically ill and injured animals. The QVSH waiting room includes a screened off area for cats. The small animal surgery suite provides five theatres, anaesthetic induction bays, a radiology suite and two minor procedures rooms for endoscopy, dentistry, laser surgery and other procedures. The recent major refurbishment provided 9 new consulting rooms, including a feline specific consulting room, and a new pharmacy. The Cancer Therapy Unit accommodates a linear accelerator to provide radiation therapy for small and large animals. Only one cat ward is occupied each week and rabbits and other small mammals are accommodated in the other cat ward when required.

3.14. The first opinion RSPCA clinic has 3 consulting rooms and a waiting area. Any cases requiring hospitalisation or surgery are brought to the QVSH. The Department also provides 24/7 veterinary services for the local Blue Cross re-homing centre (for cats and rabbits).

3.15. The large animal facilities include a two theatre surgical suite and a recently refurbished equine diagnostic unit with three examination halls. A new equine intensive care unit has been built since 2015. The farm animal facilities comprise comprise 5 large pens suitable for adult cattle, groups of sheep, goats and camelids, with 3 of these pens suitable for adult bulls. There are also 2 smaller pens suitable for small ruminants (calves, sheep, goats), camelids and pigs. In addition to the facilities in Table 3d for horses, there are more than 12 spaces in older stables, including a separate foaling unit. These are not used regularly and they also allow farm animals to be housed when farm hospital pens are full and where additional biosecurity are necessary as part of disease control programmes.

Table 3d: Places available for clinics and hospitalisation

Number of hospitalisation places for cattle	7
Number of hospitalisation places for horses	10
Number of hospitalisation places for small ruminants	2
Number of hospitalisation places for pigs	2
Number of hospitalisation places for dogs	57 in wards + 6 critical care
Number of hospitalisation places for cats	24
Number of hospitalisation places for other species	See text
Number of animals that can be accommodated in isolation facilities:	
Small animals	7
Farm animals and horses	6

3.16. The clinical pathology laboratory offers all routine chemistry, haematology, cytology and flow cytometry assays, and includes a microbiology and parasitology laboratory and a PCR room. In the histology laboratory, facilities are available for routine histology, immunocytochemistry and the production of frozen sections. Diagnostic facilities include X-ray suites and colour-flow Doppler ultrasound machines, small animal MRI, nuclear medicine unit, video endoscopy, thermography and fluoroscopy. A commercial partnership with Cambridge Radiology Referrals provides CT facilities on site.

3.17. Strong links are maintained with Bristol Veterinary School (Langford) which has an approved red meat slaughterhouse, cutting plant and meat preparation establishment. Cambridge students, in small groups (5-6 students), spend a 1 week compulsory placement at Langford. The Department also has links with local abattoirs in East Anglia which are of mutual benefit. The Department undertakes ad hoc provision of investigative pathology and advice in response to abattoir requests. In return, the Department receive teaching access, fresh teaching and research material, case studies (hygiene, meat quality, pathology and welfare issues).

3.18. These approved food premises (subject to notifiable disease status) have been visited for teaching in the last two years by the 4th year students, as part of core VPH teaching:

- C&K Meats (70 miles), approved red meat slaughterhouse, cutting plant, meat preparation and meat product premises
- 2 Sisters (90 miles), approved poultry slaughterhouse and cutting plant (not visited in 2016-17 due to avian influenza)
- University of Bristol Langford Abattoir, approved red meat slaughterhouse, cutting plant and meat preparation establishment.

3.19. All waste is collected for disposal following the University's waste guidance policy. This ensures that all aspects (segregation, labelling, accumulation, storage and transportation) are in accordance with legislative requirements. Arrangements are made in agreement with the contractor(s) who collect the waste for disposal from the Department.

3.20. The waste routes include: general and mixed recycling waste (up to 90% is recycled), which is collected and disposed of in local refuse bins for weekly collections; redundant electrical and

IT equipment, disposed of via approved contractors; chemical and solvent waste; containment level 1, 2 or 3 laboratory waste is collected separately and autoclaved before entering the general waste disposal route; all Hospital waste, which includes pharmaceutical and cytotoxic drugs, animal carcasses, faeces, and body fluids, is disposed of via the chemical / clinical waste routes.

3.21.   Cadavers requiring individual cremation are collected once weekly. General mixed waste (cadavers not requiring individual cremation, materials from Veterinary Public Health practicals etc.) are collected by arrangement when necessary.

Comments

3.22.   Lecture Theatre 1 has not been refurbished.

3.23.   The clinical skills facility has been further developed since the last visitation and is regularly used by students on a scheduled and free access basis.

3.24.   There are adequate building facilities for the current number of students.

3.25.   The 2 Sisters white meat slaughterhouse has not been used for teaching since 2016. It has been replaced by a visit to a 60 cow Jersey herd with a cheese making facility.

Suggestions

3.26   The scheduled improvement to Lecture Theatre 1 should be actioned and Lecture Theatre 2 should have improvements and expansion of its electrical supply to improve IT provision to the students.

3.27.   Attention should be given to ensuring that supporting documents for Health & Safety, biosecurity and welfare standards demonstrate evidence of regular review.

Recommendations

None

Standard 4 – Animal resources

4.1 Normal and diseased animals of various domestic and exotic species must be available for instructional purposes, either as clinical patients or provided by the institution. While precise numbers are not specified, the school must provide access to sufficient numbers of animals and quality of animal material to provide the necessary quantity and quality of animal husbandry and clinical instruction.

4.2 Schools must ensure that students are competent in animal handling relevant to the workplace learning and clinical work to be undertaken and that Health and Safety matters are briefed before the student begins their placement.

4.3 It is essential that a diverse and sufficient number of surgical and medical patients be available for the students' clinical educational experience including patients in primary care settings.

4.4 Experience can include exposure to clinical education at external sites, provided the school quality assures these clinical experiences and educational outcomes to at least the same standard as university owned facilities. Further, such clinical experiences should occur in a setting that provides access to subject matter experts at the appropriate level, reference resources, modern and complete clinical laboratories, advanced diagnostic instrumentation and ready confirmation (including necropsy). Such examples could include a contractual arrangement with nearby practitioners who serve as adjunct faculty members and off-campus field practice centres.

4.5 The teaching hospital(s) must provide nursing care and instruction in nursing procedures. A supervised field service and/or ambulatory programme must be maintained in which students are offered multiple opportunities to obtain clinical experience under field conditions.

4.6 Under all situations students must be active participants in the workup of the patient, including physical diagnosis and diagnostic problem oriented decision making.

4.7 Medical records must be comprehensive and maintained in an effective retrieval system to efficiently support the teaching, research, and service programmes of the school.

Background

4.1.   For anatomy practical teaching during years 1 and 2, approximately 18 embalmed dogs are acquired each year. Freshly euthanised animals for immediate dissections each year include: 1 pig, 4 horses, 10 ruminants, 18 rabbits, 18 domestic fowl, 36 trout. Students dissect most species in groups of 4; sheep are dissected in groups of 8, and ponies in groups of 18. In addition, fresh abattoir, market and knacker material is obtained at intervals and includes: fresh tongues, simple stomachs, ruminant stomachs, intestines, hearts, lungs, kidneys, horse distal limbs, horse heads, male and female reproductive organs, thymus, mammary glands, and placentas.

4.2.   Animals used in live anatomy practicals include 2 dogs, 10 horses and 2 cattle held by the department, plus around 20 small mammals (rabbits, rodents, ferrets), 10 reptiles (lizards, snakes, chelonians) and 20 birds loaned by local hobbyists (birds, mammals) and a wildlife park (reptiles).

$$\frac{\text{Number of students graduated in the last year}}{\text{Number of cadavers necropsied}} = \frac{64}{48} = \frac{1}{3.82}$$

Table 4a: Number of necropsies over the past five years

Species		Number of necropsies undertaken					Estimated % of necropsies observed by or undertaken by veterinary undergraduate students in most recent full year
		Yr N	N-1	N-2	N-3	N-4	
Food-producing animals:	Cattle	15	32	19	19	21	33%
	Small ruminants	49	13	27	22	23	23%
	Pigs	5	13	3	1	0	100%
	Other farm animals	3	4	0	1	0	33%
Equine		8	8	11	21	2	25%
Poultry		1	1	0	1	2	0%
Rabbits		7	8	0	0	0	14%
Dogs		79	62	79	84	81	30%
Cats		41	52	32	32	39	37%
Other/exotic		40	34	36	48	43	15%

*% of necropsies observed by or undertaken by veterinary undergraduate students in most recent full year

4.3. *Additional post-mortem material for teaching:* Selected pathological specimens from the post mortem diagnostic service are archived. Abattoir material, including porcine, bovine and ovine visceral material, is collected several times a year for use in practical pathology and Veterinary Public Health teaching in the 4th and 5th year. Uteri from farm species are collected from abattoirs and are used in gynaecology rotation practical classes. Equine heads, legs, and bovine feet are bought in and used in dentistry, nerve blocking, and foot trimming classes respectively. Materials collected from abattoirs are included with practical classes in the Alimentary and Respiratory System modules.

4.4. *Animal cadavers are also provided for teaching.* These are not always subjected to a full necropsy but are used in a number of different ways for surgical dissections and other clinical exercises (dentistry, cadaver surgery, obstetrics, soft tissue surgery, symposia). In 2016-17 the species used were: Horses 8 necropsies (above) + 4 further equines used for equine anatomy classes for preclinical students + 24 equine heads for the 5th year dentistry practical + 31 legs for other practicals; Ruminants: 46 + 16 calves and 80 cow legs for practicals; Dogs: 62 + 40 heads for canine dentistry practicals and 40 other cadavers for student/Training Scholar research projects; Cats 52 + 2 for student project work; a comprehensive range of specimens for a "forensic pathology day" provided by an external specialist.

4.5. A typical student conducts a minimum of two full post mortems (dog, cat or pig) in the 4th year pathology rotation (includes writing a post-mortem report) and actively assists in the post-mortem of at least two other cases (dog, sheep, cattle, horse) during final year rotations. In addition, students will participate in more informal field necropsies or partial necropsies as part of various other rotations.

4.6. Live animals are held at the Department and used in animal handling/husbandry practical sessions in the Principles of Animal Management course (1st year). These include the 2 dogs, 10 horses and 2 cattle and various staff dogs (on a register of dogs approved for use in teaching).

4.7. Production animals kept for teaching are mostly at the University Farm, Madingley and include 240 dairy cows, 185 dairy young stock, 230 breeding ewes (with followers), 7 entire and 7 vasectomised rams. In addition, livestock on client farms are utilised for final year rotations, including 240 dairy cows, 100 dairy young stock, 2500 beef cattle (suckler cows and finishers and 35 bulls), 5000 breeding ewes and 150 rams, >100 goats, 56 pigs (including 5 boars) and around 200 poultry (ducks, geese, chickens and turkeys). The College of West Anglia provides access to animals for 1st and 4th year teaching, including 10 weaner-grower pigs, 14 hens and 25 turkeys, 28 rabbits, 40 birds (various species), 7 cats, 4 dogs and assorted small mammals, reptiles, amphibians and invertebrate species often seen in practice.

4.8. Fresh specimens for the teaching of abattoir inspection, food hygiene, and meat inspection are collected from abattoirs in East Anglia, for various practical classes. These include 2nd year and 4th years, when core teaching includes an introductory one day visit to red & white meat establishments co-located with cutting plants, meat preparation and meat products premises.

4.9. Between 4th and 5th years, after completion of their Veterinary Public Health module, students attend the red meat abattoir at Langford for one week. The Langford teaching abattoir is approved to slaughter cattle, sheep and pigs and approved for cutting, minced meat and meat preparation. In the 6th year, within the farm animal rotation, small groups visit a farm and red meat abattoir.

4.10. The clinical teaching programme is delivered through the clinics of the Queen's Veterinary School Hospital (QVSH) which include:

- QVSH (Small Animal) Referral Hospital
- Cambridge Equine Clinic
- Cambridge Farm Practice
- RSPCA Clinic, Pool Way, Cambridge

4.11. The size of year groups at Cambridge ensures a small size of clinical rotation groups in years 4-6, maximising opportunities to interacting with and learning from the teaching staff and allowing more opportunity for hands-on experience.

4.12. The Small Animal Hospital has seen an increase in case load over the past 12 months. There have been no changes in students' involvement in cases since the last visitation.

4.13. Students play key roles in the work up and communications for all patient types (be they first opinion or referral). While they usually deliver the actual care for nearly all first opinion small animal cases, the specialist based practice base for much of the referral work precludes such overarching involvement for the referral caseload; students are however involved in rounds based discussions for all of the referral cases

Table 4b: Production Animals*

Production Animals	No. of cases in previous year involving undergraduate students											
	(a) Rec'd for consultation in school's clinics		(b) Number of hospitalised days		(c) Number of herd/flocks & average herd size		(d) Number of animals seen by students on farm/herd health visits (not including EMS)		(e) Estimate % of 1st opinion v. referral cases per species seen by students			
									1st op'n		Referral	
Last full year; Previous year	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16
Cattle	24	11	24	11	55/120	49/120	2389	1241	98	98	2	2
Small ruminants	21	4	21	4	42/150	31/150	599	310	95	95	5	5
Pigs	6	11	6	11	10/2.5	10/2.5	11	15	70	70	30	30
Food producing Rabbits & other production animals (specify)	14	16	14	16	5/3	3/3	14	16	50	45	50	55
Poultry	1	0	1	0	5/4	1/4	1	1	100	100	0	0

* NB: These numbers are different to those returned in 2016; a more robust and improved means of counting these numbers has been used.

Table 4c: Companion Animals

Companion Animals	No. of cases in previous year involving undergraduate students									
	(a) Rec'd for consultation in school's clinics		(b) Number of hospitalised days		(c) Number of animals seen by students (not including EMS)		(e) Estimate % of 1st opinion v. referral cases per species seen by students			
							1st op'n		Referral	
Last full year; Previous year	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16	16-17	15-16
Equine	263	272	377	570	2,097	2,381	90%	90%	10%	10%
Dogs	5,533	5,089	2,334	2,195	4,871	4,528	100%	100%	80%	80%
Cats	2,670	2,676	635	545	2,535	2,585	100%	100%	80%	80%

| Pet rabbits/ other/exotic (indicate species) | 136 | 160 | 19 | 22 | 135 | 160 | 100% | 100% | 80% | 80% |

Table 4d: Herd health programmes

COMPLETE THIS TABLE SEPARATELY FOR EACH OF THE LAST 5 YEARS 2017	Herd/flock health programmes provided through university owned animals		Herd/flock health programmes provided through private owned animals or government services	
	SITES (N) (Blank if none)	ANIMALS (N)	SITES (N) (Blank if none)	ANIMALS (N)
Dairy	1	300	1	300
Beef Cow-Calf			20	4000
Beef feedlots			2	150
Sheep	1	500	15	8000
Goat			2	40
Pig			6	6000
Poultry				
Fish				
Horses				
Other				

4.14. The case material in clinics is used to teach all clinical students, although the caseload for the QVSH referral Hospital is primarily used for the final years. In 4th and 5th year, two mornings per week are devoted to "clinical rotations" in which students rotate through different disciplines and species. In the 4th year induction week, students receive initial instruction in the clinical examination of the dog; they then learn/practice basic clinical examination of the cat and dog at the RSPCA clinic on Wednesday mornings, a vaccination and suture removal clinic. Students visit this clinic three times during the 4th year, in groups of around 8. For farm animal and equine rotations in 4th year, students use the teaching animals to develop skills in clinical examination, rectal palpation of cattle, foot trimming of farm animals, bandaging, injecting animals, etc.

4.15. In 5th year, students attend RSPCA clinics in clinical rotations and conduct the consultations, perform physical examinations, problem-solve and manage the clinical cases under supervision of University employed staff. Two groups of students attend each session (= seven visits per student over the year). In the 5th year equine rotation, clinical cases and in-house teaching horses with clinical conditions are utilised to teach skills in orthopaedic/lameness examination, cardiology and rectalling. The 5th year farm animal rotation covers individual animal and group/herd/flock assessments of health and disease, including further practical instruction on footcare, injections, more detailed clinical examination of specific parameters. 5th year students rotate through animal treatment

groups, delivering medication to large and small animal in-patients, receiving instruction and practice in administrating oral and parenteral medications.

4.16. In 6th year, students undertake clinical rotations in the clinics of the QVSH hospital in 2 to 4 week blocks covering surgery, medicine, radiology, anaesthesia & in-patient care, equine and farm animal and also participate in out-of-hours and critical care. Table 4c describes the case load in all areas of the QVSH; the caseload is considered is more than adequate to ensure that students experience a wide and diverse range of clinical cases; for example in a 2 week block on Small Animal Medicine a student will normally assume primary responsibility for 10–15 cases. All students share experiences within their groups through daily ward rounds, led by specialists, where they use the various electronic patient record systems to share laboratory and imaging (X-ray, ultrasound, CT, MRI) results.

4.17. Whilst the small animal case-load in the QVSH is largely referral, first opinion RSPCA cases are also managed by students in the QVSH for routine neutering and dental work. RSPCA cases are also referred to QVSH for diagnosis and management of other medical and surgical conditions. Students conduct the neutering and dental procedures, and the full pre-med/anaesthesia/post-op recovery management under direct supervision. Through exposure to such first opinion consultations (5th year) and involvement in them when in QVSH (6th year) the students gain a good balance of clinical educational experience in primary care and referral setting.

4.18. Much of the final year clinical experience is case-based one-to-one with the attending clinician. The 6th year clinical rotations group size averages 3 students per group (varying from 2–4), meaning that the maximum number of students for ward rounds on Medicine or Surgery is 8. This small group size permits the educators to facilitate involvement of the student in their own learning process though participating almost as an equal in group discussions to stimulate critical thinking and encourage self-directed learning around clinical cases.

4.19. On small animal clinical rotations the students (under supervision of clinical staff) are given full case responsibility. They conduct the consultation with the client (communication skills) taking and recording a full medical history before creating a problem list, differential list and discussing the clinical approach with the supervising clinician. The students care for and manage the cases, being responsible for upkeep of all medical records, in-patient day sheets and client communications. At discharge, they draft the report to referring veterinary surgeon and discharge instructions to demonstrate that they have fully understood the nature and management of the clinical problem and can relay these both professionally to veterinary colleagues and at a lay level to the client.

4.20. The 4-week equine rotation in final year is divided into two, 2-week blocks, one on the first opinion ambulatory service and the other in the equine hospital. Students participate fully in the clinical work-up and management of these cases; the caseload allows them opportunities to practice and develop clinical skills, including problem-solving, preparation of differential diagnoses and formulation of logical diagnostic and therapeutic plans, apply practical diagnostic techniques e.g. lameness evaluation, radiology, ultrasonography, endoscopy to the equine setting, develop further familiarity with therapeutic surgical and

medical procedures and equipment, and hone client communication skills and the ability to work within a team.

4.21.   The 4-week farm animal rotation includes exposure to first opinion cases (the Farm Animal Practice has >100 clients) allowing students to further develop their clinical skills, techniques, case management and client communication in a farming context. Additionally each student conducts a herd health analysis.

Comments

4.22.   The small rotation group size is a positive aspect of clinical teaching which enables students to optimise access and exposure to each case and to the case load.

4.23.   Effective use is made of the RSPCA clinic by introducing 4th, 5th and 6th year students to procedures and clinical situations of gradually increasing complexity.

4.24.   The farm animal practice has a wide range of clients that has increased in number mainly on smallholdings. Group/flock health can be practised by the students on small premises as well as the larger dairy, beef and sheep farms described. The timing of routine farm work during terms is a sensible way of maximizing use of the clinical material.

4.25.   The on-farm/field postmortem examinations of farm animals are a useful source of educational material for the students as well as contributing to disease surveillance on the clients' farms.

4.26.   The regular use of the teaching herd and the ease of access to horses benefits students, by offering them opportunities to understand practical equine husbandry, including handling and biosecurity in a safe and friendly environment.

4.27.   The number of dairy clients is limited due to location.

Suggestions

4.28.   Field postmortem examinations and those undertaken by clinicians as part of other rotations should be recorded in the collation of figures for post mortem examinations when seen or carried out by students.

4.29   The department should plan for additional sources of dairy cattle for undergraduate study.

Recommendations

None

Standard 5 – Information resources

> *5.1   Libraries and information retrieval are essential to veterinary medical education, research, public service, and continuing education. Timely access to information resources, whether through print, electronic media or other means, must be available to students and faculty. The library must be administered by a qualified librarian. The school must have access to the human and physical resources necessary for development of instructional materials.*
>
> *5.2   The school must provide students with unimpeded access to learning resources which include scientific and other relevant literature, internet and internal study resources, and equipment for the development of procedural skills (e.g. models). It will demonstrate how the use of these resources is aligned with the pedagogical environment and learning outcomes within the programme, and have mechanisms in place to evaluate the teaching value of innovations in learning resources.*

Background

5.1.   The Library is open 24 hours a day, seven days a week for all members of the Department, including for physical loans. Remote access to University catalogues and system databases includes: iDiscover, Web of Science, the ZETOC database - electronic table of contents and all online facilities including Scopus, Google Scholar and PubMed. Electronic material on and off campus is available to all staff and students via a secure password.

5.2.   The central University Library (UL) has responsibility for the overall running of the Library Management System with each Department and Faculty responsible for its own library information. There is a general catalogue listing books, journals and e-resources that is maintained by the UL.

5.3.   The Department library is part of the libraries@cambridge network, which is overseen by the UL and has 85 reading places. It is the primary source of veterinary information, and the Colleges and UL hold a limited number of veterinary texts. Students also have access to the Medical Library and the Betty and Gordon Moore Library, a specialist science library.

5.4.   The University moved to the web-based Moodle VLE platform in 2016. This is used for provision of lecture material which is uploaded for student reference. Moodle is available both on and off campus and can be accessed via any web browser. Moodle has the capacity to provide learning technology which is beginning to be more widely used within the Department, such as the provision of quizzes and forums. The Department has participated in a University pilot study on lecture capture, and the resulting recordings of lectures given in the Department are available via Moodle. These recordings can be searched and reviewed by the students for revision purposes and to refresh their knowledge.

5.5.   Simulations, manikins and models are used throughout the Clinical Skills Centre to enable students across all years of the course to rehearse day one competencies prior to and alongside learning situations with live animals. This includes practising skills in isolation, through to case-based patient care scenarios, which cover aspects as varied as devising treatment plans, client communication, wound care and clinical skills such as peripheral intravenous catheterisation. The manikins and models range from low fidelity, such as custom made 'isolated veins' to introduce venepuncture techniques, through to the high fidelity of the haptic device for the teaching bovine and equine rectal palpation

techniques. Some students have developed further specialist models and simulations used in the Centre as part of their final year elective projects. Where possible, the use of all learning aids is based on the best available evidence base for such tools; the Centre itself is starting to contribute to this evidence base through data collection and subsequent poster presentations.

5.6.   Within the clinical training facilities, there are 14 iPads and 2 computers in the Clinical Skills Centre and there are computers which are mainly used by final year students on clinical rotations within the Hospital area. These computers are on the Hospital patient information system; students complete patient discharge letters as part of their rotation duties on them.

5.7.   The University provides computing facilities at many central locations, and provides advice and help to students on security, assistive technology and file storage. Colleges provide computers for use by students, such as workstations in the College libraries.

5.8.   IT support in the Department is bought in from University Information Services, which provides central IT support across the University. The Department team consists of one support specialist, supported by three technicians, and an IT Manager responsible for strategic planning and oversight of IT services. The team provides comprehensive support for all aspects of IT provision across teaching, clinical, research and administrative areas, and is accountable via the Department IT Committee, reporting to Strategy & Executive Committee.

Table 5a: Library statistics (5 year comparison)

Year	2016-7	2015-6	2014-5	2013-4	2012-3
Total Budget	£52,036	£52,036	£52,036	£52,036	£52,036
Personnel	1	1	1	1	1
Books held*	3,198	3,098	3,071	3,198	3,294
Number of paid-for journals (hard copy)	28	29	95	95	96
Journal subscriptions (£)	£39,000	£39,000	£29,000	£29,000	£29,000
Acquisitions	76	115	117	123	101

*Book stock continuously checked and refreshed.

Comments

5.9.   Students have ready access (24/7) to textbooks in the Department, College and University Libraries. Students undertake an induction course to assist them to use the library facilities to their full potential.

5.10.   The Moodle platform is being used by staff and students alongside some material being provided in hard copy. Transition to paperless information is anticipated but the Department is aware that this would necessitate students paying for printing and will consider the implications and best means of such a move.

5.11.   Lecture capture has been trialed, audited and its use will be expanded.

5.12.   The clinical skills facility is well equipped and used 24/7 by the students.

Suggestions

None

Recommendations

None

Standard 6 – Students

6.1 The number of professional veterinary degree students must be consistent with the resources and the mission of the school.

6.2 Veterinary schools should establish post-graduate programmes such as internships, residencies and advanced degrees (e.g., MSc, PhD), that complement and strengthen the professional programme.

6.3 Provisions must be made, by either the university or school, to support the physical, emotional and welfare needs of students. This includes, but is not limited to, learning support and counselling services, careers advice, and fair and transparent mechanisms for dealing with student illness, impairment and disability during the programme. This shall include provision of reasonable accommodations/adjustments for disabled students, consistent with all relevant equality and/or human rights legislation.

6.4 There must be effective mechanisms for resolution of student grievances (e.g. interpersonal conflict or harassment).

6.5 Mechanisms must be in place by which students can convey their needs and wants to the school.

6.6 The school must provide students with a mechanism, anonymously if they wish, to offer suggestions, comments and complaints regarding compliance of the school with the RCVS standards for accreditation. These materials must be made available to RCVS as part of the annual report.

Background

6.1. Admission to the course is, as with all courses in Cambridge, through admission to one of 17 Colleges which admit veterinary students. Each College has an agreed quota, flexibly managed. The Veterinary Admissions Quota Committee comprises the Director of Teaching (DoT) in Veterinary Medicine, the Colleges' Director of Admissions, the Admissions Subject Convenor, and two University veterinary teaching staff. This annual meeting considers all relevant information, particularly from the Veterinary Education Committee.

6.2. At present, the aim is for 65-70 students to start the fourth (first clinical) year of the course, and to achieve this, the target for admission to first year is 73/74 students, including 4/5 mature or affiliated students (i.e. students over age 21, or with an Honours degree). There are no quotas for funded-UK, non-funded-UK, non-UK EU or non-EU students. There are no current plans to change the current numbers (which allows for a maximum of 84 offers). Any changes to the current admissions numbers would have to be agreed by Colleges.

6.3. There are many student services provided across the University. Pastoral support and welfare of students is a primary responsibility of their College, particularly their College Tutor. The University provides a Counselling Service for students; the Cambridge University Students Union (CUSU) also provides welfare and counselling services (https://www.cambridgestudents.cam.ac.uk and https://www.cusu.co.uk/advice-support).

6.4. All students are assigned a College Tutor throughout all years of their course; Colleges also appoint a Veterinary School Clinical Supervisor (VSCS), who acts as an initial contact point for the student in the clinical years and liaises with the College. The Department has a Pastoral Support Team to whom students can refer. With their consent, information may be shared between Department and College to provide extra planned academic and pastoral support.

6.5. Within the Department, the Tutorial Support Office provides 'front line' support for students, relating to timetables, examinations, etc. Support around financial assistance and hardship is available in Colleges. Students are made aware of relevant external organisations (including

Student Linkline, Vetlife Helpline, and sources within the NHS), by Colleges, and in the Veterinary Students Handbook (sent before arrival at Cambridge, and available online).

6.6. Academic support is provided by Colleges through supervisions and subject Directors of Study. Each College has a Tutorial Office that provides registration, exam entry and other support for students.

6.7. A wide variety of clubs and organisations are offered to all students in Colleges and across the University. The veterinary students organise and run their own societies; they draw up a programme of speakers, social events and symposia. Current student societies include One Health (a joint society with medical students), Cambridge Farm Animal Veterinary Society (CFAVS), Cambridge Equine Veterinary Society (CEVS), Cambridge University Veterinary Society (CUVS) and Cambridge University Veterinary Zoological Society (CUVZS).

6.8. CUVS organises an annual careers day, inviting prospective employers to attend and a Welfare Day, organised by the two CUVS welfare representatives who liaise with the Department's Pastoral Support Team. There are plans to have nominated student welfare representatives from all six years.

6.9. Students who begin the course with an identified need for support, such as dyslexia or dyspraxia, are assessed by the University's Disability Resources Centre (DRC) who work with the student and their College to recommend measures that can be put in place at Department or University level to provide help and support for that student. This is communicated via a 'Student Support Document' (SSD) that sets out the measure(s) recommended (e.g. recording of lectures, printing of handouts in a particular format). Students who become ill, disabled or who develop a problem which impairs their performance during the course, are referred to the DRC, or through other support routes.

6.10. VSCSs provide advice on obtaining employment by help with CV writing, interviews, job opportunities and features to look for in prospective employers, and write references. The Department supports the CUVS Careers Day, and liaises with the Royal Veterinary College, which invites Cambridge students to attend its annual careers fair.

6.11. Preclinical Department teaching committees all include student representatives and students may raise issues here, or through course feedback forms. Responses to student input can be found on individual course Moodle sites. Students in preclinical years are also represented on the Faculty Board of Biology, the MVST I Committee and the Veterinary Education Committee (VEC). An additional NSS-style survey of 3rd year medical and veterinary students was initiated by the Faculty of Biology in 2017. In clinical years, students articulate views via the Student Consultative Committee (SCC), focus groups, course feedback forms, surveys such as the NSS and the University-wide Student Barometer Survey, the Department's Graduate Survey, and via ad hoc feedback from student year reps. Individual students can articulate their personal academic needs via their Colleges, VSCSs or to the Director of Teaching. Student representatives sit on the Teaching Strategy and Veterinary Education Committees, the Faculty Board of Veterinary Medicine and the Equality & Diversity Committee.

6.12. Suggestions for change are considered at the above committees and, if appropriate, at the Strategy and Executive Committee. The Director of Teaching oversees implementation of

agreed changes. Examples of changes made in response to student comments are given in "You said, we did" summaries on the Moodle site.

Table 6a: Numbers of veterinary students enrolled in the veterinary school

Numbers	*2016-17*	*2015-16*	*2014-15*	*2013-14*	*2012-13*
First year	58	63	69	75	66
Second year	55	69	75	62	70
Third year	61	66	56	63	68
Fourth year	66	64	62	66	67
Fifth year	54	61	66	67	71
Sixth year	62	66	67	72	60
#Graduated	**64**	**63**	**64**	**71**	**60**

Table 6b: Veterinary applications, offers, acceptances

	UK/EU students		Overseas students		Total	
	A/P	**O/A**	**A/P**	**O/A**	**A/P**	**O/A**
Current year*	219	81	29	2	248 / 81	83 / 59
2015-16	119	71	29	5	228 / 81	76 / 60
2014-15	226	73	25	5	251 / 81	78 / 64
2013-14	314	72	33	6	347 / 81	78 / 70
2012-13	384	83	32	0	416 / 81	83 / 74
2011-12	404	72	31	5	435 / 81	77 / 66

*(for Oct 2017 entry); A/P = Applications/Positions available; O/A = Offers made/acceptances

Table 6c: Postgraduate students, including interns and residents (head count)

	Interns (n)	Residents (b)	Resident +MSc (n)	Resident + PhD (n)	Other postgrad quals*	PhD
Current year	10	20	0	0	4	47
2015-16	10	19	0	0	5	46
2014-15	10	18	0	0	8	42
2013-14	10	19	0	0	3	38
2012-13	10	18	0	0	4	39

* All MPhil.   NB: all numbers exclude graduate students on the core veterinary course

Comments

6.13.   Student support is provided by the Colleges, the University and the Department. This includes pastoral and academic support, and students expressed the view that they feel well supported

and part of a community. There is co-ordination to ensure that problems are detected early and appropriate measures implemented.

Commendation

6.14.   The support of students is commended.

Recommendations

None

Standard 7 – Admission and progression

7.1   The selection criteria for admission to the programme must be consistent with the mission of the school. The number of students admitted must be consistent with the resources available to the school.

7.2   In relation to enrolment, the school must provide accurate information in all advertisements regarding the educational programme by providing clear and current information for prospective students. Further, printed catalogue or electronic information must state the purpose and goals of the programme, provide admission requirements and procedures, state degree requirements, present faculty descriptions, clearly state information on tuition and fees along with procedures for withdrawal, give necessary information for financial aid programmes, and provide an accurate academic calendar. The information must include the accreditation status of the degree course (whether by RCVS or other relevant accrediting bodies), and the requirements for eventual registration/licence, including fitness to practise.

7.3   The selection and progression criteria must be clearly defined, consistent, defensible, be free of discrimination or bias, and take account of the fact that students are admitted with a view to their entering the veterinary profession in due course.

7.4   An accurate description of the selection criteria and processes must be published and readily available to potential students. The school must regularly review and reflect on the selection processes to ensure they are appropriate for students to complete the programme successfully, including consideration of their potential to meet all the RCVS Day One Competences across the common UK domestic species.

7.5   Adequate training (including periodic refresher training) must be provided for those involved in the selection process to ensure applicants are evaluated fairly and consistently.

7.6   Potential students must be advised of the demands of the veterinary course and RCVS requirements for fitness to practise.

7.7   Factors other than academic performance should be considered for admission, with the aim of selecting students who will be capable of succeeding in a variety of fields within the profession.

7.8   The school must have a strategy for widening participation and engaging students from a variety of social backgrounds.

7.9   If not otherwise covered within the early part of the course, the entry criteria for the programme must include evidence that the student has a solid background in the chemical, physical and biological science and mathematics, in order to meet the requirements of the EU Directive on basic subjects.

Students with a disability

7.10   There must be clear policies and procedures as to how applicants with disabilities or illness will be considered and, if appropriate, accommodated on the programme, taking into account the requirement that all students must be capable of meeting the RCVS Day One Competences by the time they graduate.

Student Progression

7.11   The basis for decisions on progression (including academic progression and professional fitness to practise) must be explicit and readily available to the students. The school must provide evidence that it has mechanisms in place to identify and provide remediation and appropriate support (including termination) for students who are not performing adequately (including areas such as practical animal handling, client communication etc).

7.12   The school must have mechanisms in place to monitor attrition and progression and be able to respond and amend admissions selection criteria and student support if required.

Student Exclusion

7.13   Mechanisms for the exclusion of students from the programme, either for academic reasons or under fitness to practise procedures, must be explicit.

Appeals and misconduct

7.14   School policies for managing appeals against decisions, including admissions, academic and progression decisions, should be transparent and publicly available. The process for exclusion of students on any grounds must be explicit.

7.15   Policies for dealing with student misconduct and fitness to practise must be explicit.

Background

7.1.   Admission to the Cambridge veterinary course is the responsibility of the Colleges. The process is monitored and moderated by the Admissions Subject Convenor who reports to the Veterinary Education Committee and the (all-subject) University Admissions Forum. Selection criteria are standardised on an all-University basis.

7.2.   The primary selection criteria are science/mathematics aptitude, assessed by performance at GCSE; the University's science/maths Admissions Assessment test; an interview, and, importantly, subsequent achievement at A-level or equivalent. A-level applicants must take Chemistry, and at least one of Mathematics, Physics and Biology/Human Biology. It is recommended that applicants take three science/maths subjects, which can include Further Mathematics. The typical conditional offer is A*AA. Details are at: www.undergraduate.study.cam.ac.uk/applying/entrance-requirements. A second selection criterion is the interview. Topics mentioned in the UCAS Personal Statement, including veterinary work experience can be discussed. Applicants are recommended to gain at least two weeks' veterinary work experience. Members of the Department and veterinary-qualified staff in other Departments interview for the Colleges.

7.3.   Affiliated entry is open to graduates with a relevant honours science degree, high levels of attainment, as well as scientific aptitude and motivation at interview. Applicants can also enter the veterinary course in the first year having previously performed well in the first year of another Cambridge course with similar entry requirements and a veterinary interview.

7.4.   The Department of Veterinary Medicine and Colleges participates in the University's policy of promoting diversity among the student population. At present, the major focus is socioeconomic and educational disadvantage. Most Colleges employ a Schools Liaison Officer tasked with encouraging widening participation in higher education in a particular region of the UK, acting as a point of contact and source of advice, as well as organising visits to the University and to schools by University staff. During the selection process a wide variety of contextual data is available regarding the opportunities available to applicants due to their educational and socioeconomic backgrounds, and the University has targets with respect to these metrics. The Department runs a Sutton Trust Access Summer School in liaison with the Cambridge Admissions Office; bursaries are available for the VetCam residential course. The University has a successful policy of never losing UK/EU students for financial reasons.

Veterinary student progression and attrition

7.5.   Student progression through the course depends on satisfactory attendance at, and engagement with, University and College teaching, examination performance throughout the VetMB course, completion of EMS requirements, completion of compulsory aspects of the Clinical Skills Checklist and satisfactory behaviour.

7.6.   Students must have passed all subjects in the 2nd VetMB examinations and have an Honours science degree before entering 4th year. Students are allowed two automatic attempts at each 2nd VetMB examination and can apply for further attempts to the Faculty Board of Veterinary Medicine under exceptional circumstances. Requests are normally supported by statements from College Tutors and Director of Studies. Remedial support is provided through Colleges.

7.7.   In the clinical years (years 4-6), students must pass all elements of the Final VetMB Examinations Part I before sitting the Part II examinations at the end of 5th year, and must pass those before progressing to final year rotations. Students are allowed three automatic attempts at Final VetMB Examinations. Remediation is provided by the Department and, where appropriate, by the student's College. Remediation for practical skills is provided through the Clinical Skills Centre and for communications skills via the relevant team. Progression through the VetMB examinations is detailed further in Standard 10. Apart from examinations, there are other requirements for progression that include:

- Attendance at all 1st term animal handling classes before sitting the Principles of Animal Management examination (1st year)
- Attendance at pre-clinical practicals before sitting subject-specific examinations
- Attendance at the compulsory Health and Safety briefing, and completion of 'preclinical EMS driving licence' prior to pre-clinical EMS
- Satisfactory performance at 1st year animal handling assessment before pre-clinical EMS can be undertaken in that species
- Completion of minimum 12 weeks pre-clinical EMS, as specified, and including student reflective reports before starting the clinical course
- Completion of 'EMS driving licence' before starting clinical EMS
- Completion of 16 weeks clinical EMS before starting final year rotations
- Completion of 26 weeks clinical EMS (including reflective exercises) and clinical skills checklist before sitting the Final VetMB Examinations Part III

7.8.   These requirements, and academic progression, are monitored by the student's College Director of Studies, their Veterinary School Clinical Supervisor and the Department's Tutorial Office together with the Director of Teaching. A Medical and Veterinary Student Progress Panel advises the Faculty Board of Veterinary Medicine, and the student's College, in supporting students with health or behavioural issues.

7.9.   On matriculation, all students must sign a Code of Conduct and are entered in the Veterinary Students Register. Students can only continue the professional veterinary course (VetMB) if they are maintained on this Register. Students can be removed from the Register if they choose to transfer to another degree, do not satisfy the requirements of the VetMB programme, or are suspended/removed by a College through its Fitness to Study policy, or on the recommendation of the Fitness for Veterinary Practice panel, whose role, procedures and constitution are described in the University's Statutes and Ordinances.

7.10.   Applicants to the veterinary course may appeal against admissions decisions by writing to the admissions tutor at their College of application. An appeal may be escalated to that College's Senior Tutor and, the Colleges' Undergraduate Admissions Complaints Panel. The University has a formal Student Complaints Procedure: www.studentcomplaints.admin.cam.ac.uk/student-complaints. This link is in a local Department document, which outlines the procedure for resolution of complaints or raising of concerns. The Department has a Responsible Officer who responds to student complaints. The University has an Examination Review Procedure: www.studentcomplaints.admin.cam.ac.uk/examination-reviews. The Office of Student Conduct, Complaints and Appeals (OSCCA) provides procedural advice, case handling and

oversight of a number of student procedures including: complaints, the review of examination results and fitness to study. OSCCA is also the point of contact for the external ombudsman, the Office of the Independent Adjudicator (OIA), with whom students can raise complaints following the completion of an internal University procedure.

7.11. Students may raise issues relating to procedural irregularities in the conduct of an examination within 5 days of the exam and/or request reconsideration of their results or marks. Issues are referred to the Chair of the relevant examining body for consideration and response. The University has a Procedure for the Review of Decisions of University Bodies. The Faculty Board of Veterinary Medicine considers requests for additional attempts at VetMB examinations. Students receive decisions from the Faculty Board in writing, describing their right to request a review.

Table 7a: Attrition of veterinary students

Entering class	Total students n	Relative attrition		Absolute attrition		Total attrition	
		Academic n (%)	Personal n (%)	Academic n (%)	Personal n (%)	n	%
2011-12	64	2 (3%)	0	4 (6%)	1 (2%)	7	11%
2012-13	66	0	3 (4%)	0	0	3	5%
2013-14	67	4 (6%)	4 (6%)	0	1 (2%)	9	13%
2014-15	75	1 (1%)	2 (2%)	0	0	3	4%
2015-16	63	4 (6%)	2 (3%)	0	0	6	10%
2016-17	60	0	1 (1%)	0	0	1	2%

Relative attrition: students who transfer to earlier years, transfer to another veterinary school.
Absolute attrition: students who leave and never return.

Table 7b: Average duration of veterinary studies

Duration of studies	Full course (n)	Advanced standing (n)*
5 years	N/A	5
6 years	57	1
7 years	-	-
8 years	-	-
9 years	-	-
10 years	-	-
Average duration of study for students who graduated in 2015-2016	6 years	5 years

'Affiliated' students, i.e. those with a first degree at matriculation

Comments

7.12. The admissions procedure assesses candidates in a manner which is thorough and contains a range of selection assessments.

7.13 Each student has frequent scheduled opportunities to meet with their college tutor and Veterinary School Clinical Supervisor (VSCS) who have access to assessment marks and to

EMS feedback. The same staff as well as other course specific staff conduct supervisions with students. Students are thus closely monitored and potential problems with progression can be rapidly identified.

7.14.   The collegiate system promotes close staff - student interaction and also enables a vertical 'familial' relationship between students in different years of the Programme who benefit from the advice of their predecessors.

Commendations

7.15   The collegiate structure and its support of students' welfare and professional progression is commended.

Suggestions

None

Recommendations

None

Standard 8 – Academic and support staff

8.1 The institution must ensure that all staff are appropriately qualified and prepared for their roles.

8.2 The total number, qualifications and skills of all staff involved with the programme, including teaching staff, 'adjunct' staff, technical and support staff, must be sufficient and appropriate to deliver the educational programme and fulfil the school's mission.

8.3 Staff who participate in teaching must display competence and effective teaching skills in relevant aspects of the curriculum, regardless of whether they are full or part time, residents, interns or postgraduate students, adjuncts or off-campus contracted teachers.

8.4 Academic positions must offer the security and benefits necessary to maintain stability, morale, continuity, and competence of the academic staff. Academic staff should have a balanced workload of teaching, research and service depending on their role; and should have reasonable opportunity and resources for participation in scholarly activities.

8.5 The veterinary school must provide evidence that it utilises a well-defined, comprehensive and publicised programme for the professional growth and development of staff; including formal appraisal and informal mentoring procedures, especially for junior academic staff. Staff must have the opportunity to contribute to the school's direction and decision making processes.

8.6 The school must be able to demonstrate that it has a programme for staff development in tertiary teaching theory/practice, and how that programme is managed.

8.7 Promotion criteria must be clear and explicit. Promotions must recognise excellence in, and place equal emphasis on all aspects of teaching (including clinical teaching), research, service and other scholarly activities.

Background

Table 8a: Academic staff of the veterinary programme – numbers & qualifications

| | Non-Veterinarians | | | Veterinarians | | | | | |
| | | | | | | | Veterinary Specialists | | |
	BSc only	MSc	PhD	BVSc or DVM only	MSc	PhD	Board Certified or Diploma holders	Board Certified / Dip holders & Masters degree	Board Certified / Dip holders & PhD
Dean/HoD									1
Professor*			0.2			3	1		3
Reader*			3			1	3	1	3
Senior Lecturer			5.76			2	0.8	1	6.15
Lecturer			2				0.6		1
Staff clinician			6.67		0.8	4			2
Teaching Fellow					0.53	1			
Junior clinician				4					

SCTS (20% FTE)				**3.8**					
Totals:			*10.96*	*14.47*		*7.33*	*10.4*	*2*	*16.15*
Total specialist vets:							**28.55**		
Total	**Non vets: 10.96**		**Vets: 50.35**						

*or clinician equivalent. N.B. Data as at 1 October 2017. Part-time staff are included in figures, which do not account for any staff roles that are vacant or being advertised. The figures do not include staff who teach on the preclinical years 1 and 2 of the veterinary course. There are two members of preclinical staff who are MRCVS with PhD.

Table 8b: Support staff of the veterinary programme

Role	Technical staff FTE	Admin & other staff FTE
Responsible for the care and treatment of animals	24.34	
Responsible for the preparation of practical and clinical teaching	17.74	
Responsible for administration, general services, maintenance, etc	3.22	32.38
Support staff primarily engaged in research	3.78	2
Total support staff	*49.08*	*34.38*

NB Data as at 1 October 2017. Figures do not account for any staff roles that are vacant or being advertised

Table 8c: Loss and recruitment of staff (both academic and clinical equivalent)

Rank/position	No. Faculty lost	Discipline/Specialty	No. Faculty recruited	Year
Senior Lecturer*	0.35	Anaesthesia	0	2017
Teaching Fellow*	0.47	Education/Equine	0	2017
Staff clinician		Farm animal	1	2017
Staff clinician		Small animal surgery	1	2017
Staff clinician	0.6	First opinion equine	0.6	2017
Staff clinician	1	Anaesthesia	1.6	2017
Staff clinician	1	Imaging	1	2017
Staff clinician	1	Clinical Pathology		
Staff clinician		Neurology	1	2017
Teaching Fellow	0.5	Farm animal		2017
Senior Lecturer*	0.7	Veterinary Public Health	0	2016
Director Small Animal Surgery (Professor level)			1	2016
Principal Clinical Neurologist (Reader level)			1	2016
Staff clinician	1	First opinion equine	1.4	2016
Staff clinician	1	Neurology		2016
Staff clinician	1	Anaesthesia	1	2016
Staff clinician	1	Farm Animal		2016

Staff clinician	1	Small animal surgery		2016
Lecturer		Clinical Pathology	1	2015
Staff clinician	1	Neurology	2	2015
Staff clinician	1	First opinion equine	1	2015
Principal Clinical Oncologist (Reader level)			1	2015
Total	**12.62**		**15.6**	

NB * losses are due to staff flexible working. Figures are provided from 2015 only as robust records are not held before that date.

8.1. The allocation of all staff to Departments in the School of the Biological Sciences is determined by negotiation in line with the allocation of public funds described in Standard 2. Additional staff are funded, with the agreement of the University, from clinical service income and other funds available to the Department.

8.2. Allocation of academic staff within the Department is based on teaching, research and clinical service needs and decided by the Head of Department in consultation with the Strategy & Executive Committee. The allocation of support staff in a non-Hospital context is similarly decided. Decisions about employment of staff funded by the Hospital is devolved to the Hospital Management Committee, taking into account the need to support teaching and clinical service work.

8.3. The Strategy & Executive Committee reviews its academic staff base on a biannual basis, develops succession plans for retirement or anticipated resignation, and plans for change in the Department's staffing base as needs evolve. The Hospital Management Committee reviews its clinician and support staff base at regular strategy meetings.

8.4. Recruitment and retention of veterinary surgeons in clinical disciplines (equine surgery, farm animal, small animal surgery, neurology, oncology, clinical pathology) is challenging, due to: 1) the shortage of available specialists in certain disciplines; 2) the higher salaries offered by specialist referral practice and industry; 3) financial incentives (clinical supplements, salary enhancements) offered by other UK Veterinary Schools but not available in Cambridge. The Department has engaged with the University to consider the introduction of a clinical supplement scheme for specialist veterinarians, and an enhanced out of hours payment scheme for clinicians on call. No scheme has yet been agreed.

8..5. The University permits the funding of additional posts from service income, contingent upon being able to service the commitment from regular clinical or other income. Clinician roles at senior and junior levels are discontinued or recruited as needs require, and short-term cover roles appointed on the same basis.

8.6. Academic freedom allows academic staff to undertake consultancies and some private practice as long as this does not impinge on their Department duties. In the case of Hospital clinical appointments, convention requires payment of privately generated clinical income (when work is undertaken during normal working hours) to be paid into a Department account and used to support conference attendance, CPD, or research. Support staff members are contractually debarred from undertaking additional paid work during Department work time.

8.7. Academic and non-academic staff can apply competitively to a small fund in the School of the Biological Sciences to meet the cost of conference attendance. Academic clinicians and other clinical staff have an entitlement of up to £1000 per year funded from service income to meet the cost of conference attendance.

8.8. Academic staff and others engaged in research who return from a period of leave due to caring responsibilities, or who reduce their hours for a period for the same reason, can apply competitively for a Returning Carers Award of up to £10,000 for attendance at scientific meetings and other forms of research support.

8.9. Entitlement to sabbatical leave is granted to Professors, Readers, Senior Lecturers and Lecturers. Eligible staff accrue one term's sabbatical leave for every six terms served, and the leave may be taken for periods of up to a maximum of three terms. Sabbatical leave is normally granted on full pay and may not unreasonably be refused. Permission must be sought from the University, and the staff member concerned is required to discuss with the Director of Teaching and to make suitable alternative arrangements for the performance of his/her teaching duties. The University normally grants limited additional funds to cover the hourly costs of substitute didactic (lecture-based) teaching, but does not cover the cost of replacement clinical teaching.

8.10. Staff across the Department are often one deep, and whilst staff numbers are generally adequate to cover teaching, there can be difficulty from within existing staff resource in providing temporary cover for sabbatical leave, sickness, maternity or shared parental leave, and paternity leave. Funding for additional cover posts has to be found from the Department's own resources and in most circumstances this cover is appointed.

8.11. Incoming junior academic staff are allocated a senior mentor from the outset and that person follows them through the initial years of their career, providing advice and feedback on progress. The Department tries to ensure that all early career academic clinicians have the opportunity to follow postdoctoral-level programmes in order to further their research careers; in the past three years, two junior academics have been seconded to postdoctoral laboratory work. The Department has yet to introduce mentoring programmes for other categories of staff.

8.12. The Department participates in the University's Staff Review and Development Scheme (SRD), and has a tailored version of the scheme specifically for academic staff. The Scheme has been rolled out to all support staff, but the Department has yet to implement the SRD for staff clinicians and research contract staff.

Comments

8.13. Progression pathways for academic staff are clear and transparent with a focus on research. Clinical staff who are not on academic staff contracts are not able to apply for progression through these pathways. This is clear and transparent and staff are aware of this.

8.14. The implementation of staff reviews, and developments arising from these, have been well received by staff.

Suggestions

8.15.   There is a strong emphasis on research outputs for academic progression. It is suggested that the Head of Department continues to work within the University to provide a stronger emphasis on consideration of teaching and clinical activities in progression pathways.

Recommendations

None

Standard 9 – Curriculum

9.1   The curriculum must be designed, resourced and managed to ensure all graduates have achieved the graduate attributes expected of a degree programme at level 7 in the European Qualifications Framework, the minimum training requirements in the European Directive 2013/55/EU on the mutual recognition of professional qualifications, and the RCVS Day One Competences.

9.2   The learning outcomes for the programme must be explicitly articulated to form a cohesive framework.

9.3   Programme learning outcomes must be communicated to staff and students and:

- underpin and ensure the effective alignment of all content, teaching, learning and assessment activities of the degree programme;
- form the basis for explicit statements of the objectives and learning outcomes of individual units of study; and be reviewed, managed and updated to ensure they remain relevant, adequate and are effectively achieved.

Management

9.4   The school must have a formally-constituted committee structure (which includes effective student representation), with clear and empowered reporting lines, to oversee and manage the curriculum and its delivery. The committee(s) must:

- determine the pedagogical basis, design, delivery methods and assessment methods of the curriculum,
- oversee quality assurance of the curriculum, particularly gathering, evaluating, making change and responding to feedback from stakeholders, peer reviewers and moderators, and data from examination/assessment outcomes,
- review the curriculum at least every seven years and
- identify and meet teacher training needs for staff, maintaining currency of their skills and competence for future curriculum development.

Content

9.5   The curriculum should include the following:

- understanding of biological principles and processes of veterinary significance
- expertise in recognising and advising on normal animal structure and function, husbandry, behaviour, nutrition and feeding, reproduction and breeding, homeostasis, pathophysiology, agents of disease and the natural history and clinical manifestations of important animal diseases
- expertise in medicine, surgery, and anaesthesia applicable to a broad range of common species. Students must develop entry-level skills in physical examination and laboratory diagnostic techniques and interpretation (including clinical pathology, diagnostic imaging and necropsy), disease prevention, biosecurity, therapy (including surgery and pharmacotherapeutics), patient management and care (including primary care, intensive care, emergency medicine, surveillance and isolation procedures) for individual animals, herds, flocks and other populations
- knowledge, skills, values, attitudes and behaviours necessary to contribute, as a veterinarian, to promoting animal health and well being, within changing societal expectations
- clinical, epidemiological, pathophysiological and regulatory skills in management of animal diseases which are:
    - endemic to the UK and the EU
    - endemic to and of special consideration in the country in which the school is located;
    - exotic to the UK and the EU and which are currently regarded as being of concern as potential emergency animal diseases or diseases of global veterinary significance
    - significant emerging diseases
- entry level capability (to OIE standards) in preventative medicine/epidemiology, zoonoses, food safety and hygiene, regulation of animals and animal products, and management of the interrelationship of animals and the environment. This training must include experience in abattoirs.
- professional level problem solving skills in evidence-based diagnosis and clinical management, and data and information management skills
- capacity for professional communication; the ability to acquire information from the owners of animals by direct interaction as well as retrieval of archival data from medical records, communication with colleagues, regulatory bodies and clients
- skills in application of professional ethics, delivery of professional services to the public, personal and business finances and management. An appreciation of the breadth of veterinary science, career opportunities and relevant information about the veterinary profession

Background

Basic Subjects

9.1.   Cambridge is unique among UK vet schools in its co-teaching with medical and biological science students in years one to three, and the College supervision system that supports student learning and understanding.

9.2   Anatomy, biochemistry, physiology, pharmacology and general pathology (including basic microbiology, virology and parasitology) are taught in 1st and 2nd years. In 1st year, Homeostasis (HOM; physiology), Molecules in Medical Sciences (MIMS; biochemistry) and histology are taught alongside medical students. Veterinary Anatomy and Physiology (VAP) is taught to veterinary students only. All three subjects contribute to MVST (Medical and Veterinary Sciences Tripos) IA (that contributes to the BA degree) and 2nd VetMB examinations.

9.3.   Veterinary anatomy (Comparative Vertebrate Biology; CVB), vertebrate reproductive biology (VRB; co-taught with Natural Sciences students), neurobiology and animal behaviour (NAB; partly co-taught with medical students), pharmacology (Mechanisms of Drug Action; MODA; largely co-taught with medical students) and general pathology, microbiology, virology and parasitology (Biology of Disease, BOD, co-taught with medical and Natural Sciences students) make up Year 2 and contribute to the MVST IB and the 2nd VetMB examinations

9.4.   From 2018, the MVST will be replaced by the Veterinary Science Tripos (VST). This will still be taught in much the same way as the MVST but will give the Department greater ownership and flexibility in driving the future development of the programme.

9.5   Students select from a range of options for 3rd year. While these fall outside the formal veterinary curriculum (and lead to the BA degree) these provide an important opportunity for students to participate in research, some of which occurs within veterinary research groups.

Many students described this as beinging their main reason for choosing Cambridge Veterrinary School. 'Affiliated' students, who already possess an Honours science degree, progress directly from 2nd to 4th year.

Animal Production

9.6. Basic and applied science and understanding of animal husbandry, housing, welfare, behaviour and nutrition are taught in the Principles of Animal Management (PAM) course in 1st year and the Integrated Animal Management (IAM) course in 4th year and both include practical instruction in animal handling. Preclinical EMS and supervision of the lambing flock at the University Farm in 4th year consolidate students' understanding and practical skills in animal husbandry. PAM contributes to the 2nd VetMB and IAM to the Final VetMB examinations.

9.7. There is integration of teaching between PAM and elements of the MIMS, HOM, NAB and VRB courses (e.g. nutrition, reproductive cycles) and the Animal Breeding course (4th year). The latter is linked with teaching in infertility and obstetrics and species-specific clinical courses.

Clinical Subjects

9.8. A matrix of discipline-related, organ system-based and species-specific teaching covering para-clinical and clinical subjects is delivered through a blended combination of lectures (some interactive), scenario-based teaching, laboratory-based practicals, seminars, directed learning sessions and clinical rotations in 4th and 5th years. These courses cover aetiology, pathogenesis, pathology, diagnosis, treatment, management and prevention of important conditions and are described in Tables 9a and 9b. This teaching is consolidated in the 22 weeks of lecture-free, case and scenario-based clinical rotations in 6th year.

9.9. The first term of 4th year develops the veterinary context from the preclinical course (e.g. Clinical Pharmacology builds on the MODA course, Principles of Infectious Disease (PID) builds on BOD) and introduces clinical areas to prepare for EMS (e.g. imaging, anaesthesia, surgery) with lectures, seminars and lab-based practicals supported by clinical skills centre rotations. Integrated Animal Management (IAM) builds on Principles of Animal Management (PAM) and Animal Breeding on the 2nd year VRB course. Thereafter, individual courses dovetail to deliver an effective clinical curriculum (e.g. Infertility and Obstetrics in 5th year follows Animal Breeding in 4th year and the small animal medicine course in 5th year follows the majority of individual organ system course teaching).

Food hygiene

9.10. The Veterinary Public Health (VPH) course in 4th year includes most of the food hygiene teaching, although the principles of food production and hygiene from a veterinary context are introduced PAM and Preparing for the Veterinary Profession (PfVP) in 2nd year. The biology of infectious agents such as *Salmonella* and *Campylobacter* are included in Biology of Disease (BOD) and PID in 2nd and 4th years. VPH builds on this prior knowledge to cover food hygiene and One Health; food hygiene is also included in food animal species courses in 4th-6th years. VPH is examined, in various formats, at the end of 4th and 6th years

Preventative medicine

9.11. Teaching of preventative medicine in production animals (herd/flock health, infertility, herd health schemes, husbandry measures, housing) is included in the animal management courses in 1st and 4th year, PID (4th year), species medicine courses (4th and 5th years) and is a key aspect of the farm animal rotation in 6th year. Students gain further experience of preventative medicine when lambing the University Farm sheep flock (4th year). All students produce a herd/flock health investigation during their final year farm animal rotation (assessed). Vaccination, anthelmintics and the role of husbandry and management in preventative medicine of companion animals are covered in various courses in 5th year.

Professional skills

9.12. *Animal Handling Skills* in a range of species are taught and assessed in 1st year, prior to pre-clinical EMS, and remedial support is offered. They are re-assessed in 4th year. Optional "drop-in" and "sign-up" sessions are available for all students to maintain and improve these skills.

9.13. *Communication Skills* are introduced in the PfVP course (2nd year), including consultation room skills and the Cambridge-Calgary method of veterinary consultation. Increasingly complex scenarios are taught in small group teaching through 4th and 5th years. Formative feedback is provided during clinical rotations in 4th and 5th year (e.g. RSPCA Clinic, where students perform the consultations) and also within final year rotations. Students are encouraged to reflect on their consultation skills and are required to reflect on at least two encounters between a veterinary surgeon and client (communication skills exercise) as part of their clinical EMS requirements. Video recordings are made of students' consultations during the small animal medicine rotation in final year and are formally evaluated. Written communication with clients and veterinary surgeons is formally evaluated in small animal medicine, neurology, oncology, soft tissue and orthopaedic surgery rotations.

9.14. *Clinical Skills* are developed through teaching in the Clinical Skills Centre (including Merton Hall Farm) and the University Farm, in clinical rotations in 4th and 5th year; students are expected to be competent and confident in a wide range of clinical skills prior to 6th year when they perform procedures on live patients (including anaesthesia, neutering, routine dental procedures & intravenous catheterisation). A detailed schedule of teaching of different skills in 4th and 5th year and mapping to the wider curriculum has been developed. Students in all years have 24/7 access to the Clinical Skills Centre to practise and develop their skills; drop-in sessions are also scheduled within the 5th year timetable. Optional, contextualised, clinical skills teaching is delivered to pre-clinical students through peer teaching by trained 5th year students (a collaboration with the Cambridge University Veterinary Society).

9.15. *Research Skills* are developed through the Introduction to the Scientific Basis of Medicine (ISBM; 2nd VetMB examination subject) course in 1st year, their 3rd year Part II project (either laboratory project or dissertation), the Evidence-Based Veterinary Medicine (EVBM) course in 4th year and the clinically-focussed VetMB Research Project conducted in 5th-6th year as part of the elective programme.

Table 9a: Digest of units of study (hours)

Unit title	Lectures (1)	Tutorials Seminars/ Problem based learning (2)*	Online & other (3)	Labs & Super-vised Practical (4)	Clinical (5)	EMS (6)	*Total*
Year 1							
Histology				20			*20*
Introduction to the Scientific Basis of Medicine	10						*10*
Homeostasis	58	20		23			*101*
Molecules in Medical Science	52	20		18			*90*
Veterinary Anatomy & Physiology	41	20		98			*159*
Principles of Animal Management	29	6		30			*65*
Year 2							
Biology of Disease	43	20		50			*113*
Mechanisms of Drug Action	42	20		51			*113*
Neurobiology & Animal Behaviour	49	20		26			*95*
Veterinary Reproductive Biology	24	16		16			*56*
Comparative Veterinary Biology	22	4		30			*56*
Preparing for the Veterinary Profession	9	13		6			*28*
Year 4							
Alimentary System	25			15			*40*
Principles of Anaesthesia	10	4		6			*20*
Animal Breeding	20			4			*24*
Cattle Medicine	22						*22*
Clinical Pathology	16			12			*28*
Clinical Pharmacology and Therapeutics	8	2					*10*
Dentistry	4						*4*
Evidence Based Medicine	8						*8*
Exotic, Wildlife and Conservation Medicine	19						*19*
Integrated Animal Management	34						*34*
Principles of Infectious Diseases	36			15			*51*
Principles of Oncology	8						*8*
Ophthalmology	10						*10*
Orthopaedic Pathology	6			3			*9*
Poultry	10						*10*
Radiography and Radiology	9						*9*

Unit title	Lectures (1)	Tutorials Seminars/ Problem based learning (2)*	Online & other (3)	Labs & Super-vised Practical (4)	Clinical (5)	EMS (6)	Total
Respiratory System	9			3			12
Small Ruminant Husbandry and Medicine	19			6			25
Principles of Surgery	5			2			7
Veterinary Public Health (VPH)	36			38			74
Pathology Seminars		9					9
Year 4 clinical rotations							
Equine Clinical				12			12
Equine (World Horse Welfare)				4			4
Exotic Animal Management				4			4
Farm Animal				10			10
Post Mortem		1		21			22
Radiography				4			4
Small Animal Clinical Studies				7			7
RSPCA Clinic				12			12
Consultation Skills				7			7
Clinical Skills Centre				15			15
VPH / Bristol Abattoir Rotation				14			14
Lambing				24			24
Year 5							
Cardiology	14			2			16
Cattle Medicine	5			4			9
Clinical Pathology	3		4	3			10
Dentistry	5			6			11
Dermatology	13		2	3			18
Emergency and Critical Care	8						8
Endocrinology	12			3			15
Equine Medicine	17						17
Equine Orthopaedics	10						10
Equine Surgery	10		1				11
Infertility & Obstetrics	22						22
Neurology	12			9			21
Pig Medicine	13						13
Practice Management	6	5					11
Reproductive System Pathology	4			2			6
Small Animal Medicine	16						16

Unit title	Lectures (1)	Tutorials Seminars/ Problem based learning (2)*	Online & other (3)	Labs & Super-vised Practical (4)	Clinical (5)	EMS (6)	*Total*
Small Animal Orthopaedics	15			2			*17*
Soft Tissue Surgery	19						*19*
Urology	10			3			*10*
Year 5 clinical rotations							
Equine Studies				16			*16*
Farm Animal				15			*15*
Gynaecology				8			*8*
Neurology				4			*4*
Radiography / Radiology				28			*28*
RSPCA Clinic					28		*28*
Pathology Seminars		4		6			*10*
VPH				16			*16*
Communication Skills				3			*3*
Clinical Skills Centre				18			*18*
Clinicopathological Case Discussions				20			*20*

* includes college supervisions / tutorials

N.B. Credits are not used in Cambridge and so the column has been deleted. Year 3 is not reported as it falls outside of the accredited VetMB course.

9b: Digest of disciplines and subjects (student hours in course)

Subject	Lectures (1)	Tutorials Seminars/Problem based learning (2)	Online and other (3)	Labs & Super-vised Practical (4)	Clinical (5)	EMS (6)	*Total*
Basic subjects & sciences							
Anatomy, histology, embryology	68		44	136			248
Biochemistry	52		30	28			110
Biology, cell biology		Requirement for entry					
Chemistry		Requirement for	entry				
Physiology	54		25	23			102
Molecular biology		Included in biochemistry, immunology and microbiology					
Scientific method	10			4			14

Subject	Lectures (1)	Tutorials Seminars/Problem based learning (2)	Online and other (3)	Labs & Super-vised Practical (4)	Clinical (5)	EMS (6)	*Total*
Biostatistics	Included in scientific method						
Genetics	Included in biochemistry						
Epidemiology	10						10
Immunology	8			6			
Microbiology	43			13			56
Parasitology	33			72			105
Pathology, pathophysiology	72		20	125			217
Pharmacology	45		20	39			104
Pharmacy	3						3
Toxicology	Included in pharmacology						
Environmental protection and conservation	3						3
Animal Production							
Agronomy	4			2			6
Animal nutrition	22			4			26
Animal husbandry & production, incl. aquaculture	48			22			70
Livestock production economics			10				10
Animal behaviour & behavioural disorders	12			6			18
Animal protection & welfare	8			3			11
Preventative vet medicine, health monitoring	3		10				13
Reproduction & obstetrics	67		16	29			112
Clinical subjects							
Anaesthesia	16			4	80		100
Clinical examination & diagnosis				14			14
Clinical pathology	19			20			39
Diagnostic imaging	9			35	80		124
Clinical medicine	169			17	495		681
Surgery	64			6	252		322
Therapeutics	9			8			17

Subject	Lectures (1)	Tutorials Seminars/Problem based learning (2)	Online and other (3)	Labs & Super-vised Practical (4)	Clinical (5)	EMS (6)	*Total*
Emergency & critical care	8				80		88
Exotic & epizootic disease		Included in other courses					
Zoonoses & public health	36			6			42
Government veterinary services		Included in Veterinary Public Health					
Food hygiene							
Veterinary certification	1			3			4
Regulation & certification of animal & animal products	1			3			4
Food hygiene & quality	25			30			55
Professional Knowledge							
Professional Ethics & behaviour	14			6			20
Veterinary legislation	8						8
Communication skills	3			23			26
Practice management & business	7			5			12
Information literacy & data management	18						18

N.B. The integrated course complicates allocation of time under the headings suggested. The cognate discipline of parasitology has been added to allow separate report.

Table 9c: Clinical Rotations

	List of individual rotations	Duration (hours)	Year of programme
Core intramural rotations			
	Farm Animal Clinical Studies	6	4th Year
	RSPCA Clinic	9	4th Year
	Equine Clinical Studies	9	4th Year
	Consultation Skills	6	4th Year
	Post Mortem	12	4th Year
	Radiography	6	4th Year
	Clinical Skills Centre	12	4th Year

	List of individual rotations	Duration (hours)	Year of programme
	Small Animal Clinical Studies & Ward/Husbandry	3	4th Year
	Radiology	21	5th Year
	RSPCA Clinic	21	5th Year
	Cattle – Footcare	3	5th Year
	Equine rectal exam/ haptic teaching	3	5th Year
	Ophthalmology	3	5th Year
	Veterinary Public Health	6	5th Year
	Consultation Skills	3	5th Year
	Clinical Skills Centre	6	5th Year
	Cattle Clinical Studies	3	5th Year
	Cattle – Obstetrics	3	5th Year
	Cattle – Gynaecology	3	5th Year
	Equine Cardiology	3	5th Year
	Equine lameness	3	5th Year
	Neurology	3	5th Year
	Small Animal Soft Tissue Surgery	80	6th Year
	Small Animal Orthopaedic Surgery	80	6th Year
	Small Animal Medicine	80	6th Year
	Farm Animal *	160	6th Year
	Equine ambulatory	80	6th Year
	Equine hospital	80	6th year
	Anaesthesia	80	6th Year
	Out of Hours / Emergency Critical Care	80	6th Year
	Radiology	80	6th Year
	Neurology	40	6th Year
	Oncology	40	6th Year
Core distributed rotations			
	Exotic animal handling (College of West Anglia)	3	4th Year
	Equine clinical skills (World Horse Welfare)	3	4th Year
Elective rotations	(Choice described in text)	320**	6th Year
Other	N/A	N/A	N/A

* includes 2 hours VPH seminar; ** includes VetMB Research Project conducted over years 4-6

9.16. Minor changes to curriculum content (e.g. updating content, balancing of content within a course/module, responding to feedback comments from students or staff) may be approved by course committees and are reported to MVST I Committee if pre-clinical or to the Teaching Strategy Committee (TSC) if clinical, for approval.

9.17. Stakeholders, including external and Associate Lecturers, Government Veterinary Service lecturers, employers and recent graduates through relevant surveys, provide input to many courses. A series of external reviews of the clinical curriculum commenced in 2016: reviews of farm animal and equine teaching were completed in 2017 and planned reviews will focus on small animal surgery, small animal medicine and other clinical disciplines. These reviews are considered by course organisers and TSC.

9.18. Proposals for substantive changes, from staff, course organisers or Directors of Teaching, are considered at the relevant teaching committees if approved by Faculty Boards (Biology for pre-clinical & Veterinary Medicine for clinical courses). Changes are then proposed to VEC.

EMS

9.19. A named academic member of staff acts as EMS Co-ordinator and is supported by a Deputy to oversee preclinical EMS. Veterinary School Clinical Supervisors (VSCSs) support these coordinators by overseeing individual students' EMS. The Tutorial Support Officer and Tutorial Support Assistant provide administrative support for EMS.

9.20. Students are required to complete the Animal Husbandry learning tool developed by Universities of Edinburgh and Nottingham and to have passed animal handling assessments before starting preclinical EMS. They have to have completed a minimum of 12 weeks preclinical EMS and reported on it before starting 4th year. Clinical students must complete the EMS Driving Licence (produced by University of Edinburgh) before undertaking clinical EMS, to have completed 16 weeks EMS before taking the VetMB Examinations Part II at the end of 5th year and to have completed the preparatory EMS placements before final year rotations in the relevant species. For clinical EMS placements, students discuss and agree a series of Aims and Objectives with their VSCS before undertaking the placement and review achievement of these aims, with written self-reflection following completion of the placement. Placement providers provide feedback on student performance (and *vice versa*).

Table 9.1.3: EMS: Recommended number of weeks required in EMS

	Minimum duration	**Year of programme**
Production animal farm experience (pre-clinical)	2 weeks dairy or beef cattle 2 weeks pigs 2 weeks sheep 2 weeks choice (including repeats of others, zoo/wildlife park, lab animal house, poultry, or overseas farm*)	Years 1 – 3 (Years 1 – 2 if affiliated)
Companion animal preclinical experience	2 weeks equine 2 weeks kennels or cattery	Years 1 – 3 (Years 1 – 2 if affiliated)

Clinical – companion animal	2 weeks preparatory (first opinion)	Year 4 (ideally)
	2 further weeks	Years 4 – 6
Clinical – production animal	2 weeks preparatory (first opinion)	Year 4 (ideally)
	2 further weeks	Years 4 – 6
Clinical – other	Equine - 2 weeks preparatory (first opinion)	Year 4 (ideally)
	2 further weeks	Year 4 – 6
Food hygiene, abattoir**	Optional (see below)	Year 4
Other (specify)	14 weeks choice, including any of above choices, APHA, abattoirs, certain conferences, Cambridge RSPCA clinic, elective project or EMS abroad***	Years 4 – 6

* A maximum of 2 weeks of overseas farm is permitted.

** Students spend 3 days at Bristol Vet School abattoir, as part of intramural studies.

*** A maximum of 6 weeks of overseas clinical EMS is permitted.

9.21.   The final year elective programme was revised in 2016-17. Eight weeks are devoted to elective study, composed of two elements: a VetMB Research Project and a 4-week period of seminar-based study in 6th year after final exams. A list of indicative clinically-based research projects and supervisors is provided but students are encouraged to develop their own project ideas. Project proposals signed by student and supervisor are submitted to the Tutorial Support Office. Students indicate preferences for their post-examinations elective; decisions are based on the number of places available. In the rare event that an elective subject area is over-subscribed, participants are encouraged to make other choices. If subject areas are still over-subscribed, allocation is made by the drawing of lots. Unallocated students either choose an undersubscribed elective or may arrange independent electives approved by the Elective Course Organiser and the Director of Teaching.

9.22.   During the 4th year there is an introductory one-day large group visit to either red and/or white meat establishments, co-located with cutting plants, meat preparation and meat products premises. Between 4th and 5th years, after completion of their VPH course, students attend the red meat abattoir at Langford, in small groups, for one week, and receive a structured teaching and experience in relevant theoretical and practical tasks. Each student is given an opportunity to use a captive bolt pistol on detached bovine (or exceptionally pig) heads. Some groups may also observe sausage-making. By the end of the visit each student gives an oral presentation on her or his experiences and submits written case reports to Bristol lecturers for assessment. Where relevant and appropriate, the written report is used as feedback to the farmer. In addition each student is given two post mortem specimens on which to write reports, which are also marked. Students who fail assignments are given a further opportunity

in the Cambridge post mortem room with teaching staff, to learn and discuss the subject until they meet a satisfactory standard.

9.23.   In 5th year, students are presented with VPH, often abattoir-based, scenarios on which to work in Michaelmas term and on a specific complex issue in Lent term. Students in Lent term are assessed individually on written and verbal skills and assessment of abattoir specimens. In the 6th year farm animal rotation, students visit a farm with a red meat abattoir, cutting plant, and butcher's shop producing meat preparations, meat products and selling Other Products of Animal Origin (a real farm-to-fork premises) in small groups. Students observe for non-compliances, then subsequently discuss the risks to public & animal health and welfare.

Comments

9.24.   The Department has introduced a number of changes to the veterinary curriculum, in particular:

- The development of the VetST, which has support from other Departments involved in delivery and who have already been working at modifying their delivery and curricula to ensure relevance for veterinary students.
- The introduction of animal handling and clinical skills sessions with assessment to ensure students are prepared for EMS.
- The development of a Clinical Skills Centre run by enthusiastic staff, and which is appreciated by students.
- New training opportunities in teaching and assessment for staff and a marked increase in the number of staff with teaching qualifications.
- The introduction of Moodle and its widespread uptake, along with the use of lecture capture.

9.25   Documentation for the Veterinary Programme (MVST and the VetMB) and its component courses and sessions is inconsistent in its use of, and terminology for, learning outcomes. Some elements of the Programme have explicit learning outcomes, and others have a mixture of outcomes and objectives. A few have 'aims and learning objectives' with no explicit outcomes.

9.26.   Students and staff were largely content that they knew what they were being taught or were teaching. The Department is working towards more comprehensive teaching, learning and assessment strategies. Currently the Department does not have a coherent framework of Programme and course learning outcomes that has been mapped to both RCVS Day One Competences and assessments.

Recommendations

9.27.   The Department must complete its planned curriculum review and move from the use of 'aims and objectives' to unambiguous learning outcomes at all levels of the Programme.

9.28.   A cohesive framework of learning outcomes must be communicated to staff and students and underpin the constructive alignment of all content, teaching, learning and assessment activities of the degree Programme and individual units of study to the Royal College of Veterinary Surgeons Day One Competences.

9.29.   Progress on the above must be reported as part of the RCVS annual monitoring process.

Standard 10 – Assessment

Management

10.1   *The institution must ensure that there is a clearly identified structure within the school showing lines of responsibility for the assessment strategy to ensure coherence of the overall assessment regime and to allow the demonstration of progressive development across the programme towards entry level competence. The strategy must be underpinned by robust quality assurance mechanisms.*

Policy and Regulation

10.2   *The assessment tasks and grading criteria for each unit of study in the programme must be clearly identified, and available to students in a timely manner well in advance of the assessment.*

10.3   *Requirements to pass including the effect of barrier assessments must be explicit.*

10.4   *Mechanisms for students to appeal against assessment outcomes must be explicit.*

10.5   *The school must have a process in place to review assessment outcomes and to change assessment strategies when required.*

Assessment methods and design

10.6   *Programme learning outcomes covering the full range of professional skills and attributes must form the basis for assessment design and underpin decisions on progression.*

10.7   *Assessment must inform student learning and students must receive timely feedback.*

10.8   *Assessment load must be planned and managed to achieve appropriate workloads for students and staff.*

10.9   *Assessment strategies must allow the school to certify student achievement of learning objectives at the level of the programme and individual units of study.*

10.10   *Methods of formative and summative assessment must be valid and reliable and comprise a variety of approaches. Direct assessment of clinical skills (some of which may be on simulated patients), must form a significant component of the overall process of assessment in the clinical disciplines.*

Assessment standards and quality assurance

10.11   *There must be procedures in place to maximise the fairness, validity and reliability of assessment outcomes, including but not limited to academic peer review of assessment content, proofing of scripts, supervision and invigilation, maintenance of records and moderation processes.*

10.12   *Schools must have appropriate moderation processes in place to ensure parity within and between individual units of study, across the programme, with other institutions; and to ensure that each student is fairly treated.*

10.13   *The school must be able to demonstrate that there are appropriate measures in place to ensure that grades awarded reflect an appropriate standard of performance by students against the relevant learning objectives.*

Background

10.1.   Examinations are governed by University of Cambridge procedures and governance. The course leads to the award of two degrees, which are expected to fulfil RCVS Day One Competences, as well as EAEVE guidelines. The VetMB (Bachelor of Veterinary Medicine degree) is examined during the first two preclinical years (2nd VetMB examinations) and the last three clinical years (Final Veterinary Examinations Parts I, II & III). The BA(Hons) degree is awarded after completion of the third year of study.

10.2.   Examinations involve a mixture of MCQs, written SAQs, essay questions, practical (laboratory)-based papers, clinical assessment during rotations, and final year *viva voce* (oral)

examinations. There is an emphasis on critical thinking. There is a progression from short answer format to interpretative written and practical skills assessment as the course progresses. The purpose of the initial examinations is to test basic factual recall, moving towards integrative and synthetic Day 1 Competences required of a veterinary clinician later in the course.

10.3. Within the Curriculum Overview and Lecture List, each course and most units within them have clearly stated aims and objectives. Examination questions are received from staff delivering the teaching and are chosen to map to course aims, objectives and content. Draft examination papers (questions and model answers) are delivered to external examiners for comment and amended where necessary. Throughout the course, students receive formative assessment in varying forms, from 'supervisions' (small group performance and marked essays in the preclinical years), to feedback during 6th year clinical rotations. Students have a Director of Studies in the preclinical years and a Veterinary School Clinical Supervisor in the clinical years, who provide comment and guidance on their progress. The first two preclinical years cover basic veterinary sciences. Each subject has three papers, two of MCQs or SAQs (theory and practical, contributing to 2nd VetMB and Tripos) and one of essays (contributing only to Tripos classification). There are, in addition, three applied veterinary courses (contributing to 2nd VetMB only).

10.4. MCQ papers have a pass mark of about 60 % set by a modified Hofstee method where possible. The essay papers have continuous grading with written descriptors. Marks from different subjects are combined for the overall Tripos classification. In these pre-clinical examinations, the MCQ or SAQ papers are designed to assess the students' level of knowledge (theory) across the breadth of the examinable material: they tend to be factual recall-type questions and are blueprinted against the taught material in a balanced manner. The practical-based MCQ/SAQ papers are more interpretive in style. Questions in essay papers are designed to allow students to demonstrate depth of understanding of course material and the ability to integrate knowledge from different aspects of the course. The essay papers provide a choice of questions for students.

10.5. College Supervisors conduct formative assessments of student understanding of learning objectives throughout the year, including in 'mock' examinations. Students receive weekly feedback from their supervisors, who can access the student's examination papers to aid provision of remedial support to those who fail VetMB examinations. In addition, the VAP and CVB courses incorporate modular formative assessments to aid student learning.

10.6. The third preclinical year is usually a single science subject with examinations comprising dissertations, research projects, practical and essay papers.

10.7. In the preclinical years, it is possible to fail individual 2nd VetMB subjects and progress to the following year of study, but all 2nd VetMB examinations must be passed before entry to the clinical course (year 4). Two attempts are allowed at each examination. Following successful completion of year 3, Part II, students are awarded a BA(Hons) degree, which is a prerequisite for progression to the clinical course. Affiliated students are graduates and already have an honours degree from Cambridge or another institution upon joining the course so do not undertake the Part II year, but progress directly from the MVST to the clinical course.

10.8. The Final Veterinary Examination (Parts I, II and III) is taken in the clinical years. Part I exams, comprising ten MCQ papers, are mainly systems-based. Exams are computer marked with unit analysis to assess suitability of individual questions. The pass mark is 60 %, merit 90 %. They take place over the first five terms of the clinical course. Three attempts at examination are allowed. The aim of the Part I examinations is to allow students to demonstrate underpinning knowledge of examinable material. The exams contain a combination of factual recall and interpretation style questions. Each examination is blueprinted to ensure a balanced coverage of content. All 10 examinations must be passed as a prerequisite for taking the Part II exam. Feedback on year group performance is given to the whole class at the start of the term following each exam; individual students can access their marks via their folder on Moodle and Veterinary School Clinical Supervisors provide feedback to their supervisees. Provision of any remedial support is organised by the student's College.

10.9. The Part II exam (covering basic clinical sciences) is taken at the end of the 5th year and has two written papers and a practical exam. All questions are compulsory. Students are given a dedicated revision period before the exam. Written papers have a combination of essay questions and SAQs; the practical paper is a steeplechase type exam with SAQs, with each station comprising a scenario, a pathological specimen/results of investigative tests and a series of linked questions. The Part II exam contains more interpretation style questions in different formats and is designed to assess deeper levels of integrated knowledge and understanding than the Part I exam. The Chair of Part II Examinations is responsible for ensuring that the three papers collectively provide a balanced coverage of the examinable content and the intended learning objectives of the taught materials. The method of post-exam feedback is similar to that for the Part I exams. The pass mark is set at 50 %, with a minimum of 40 % in each of the three parts, with merit set at 67 %. Part II must be passed as a prerequisite for progression to the final clinical year.

10.10. The 6th year comprises a series of clinical rotations which are continually assessed; students are given individual verbal feedback part-way through the rotation and individual written feedback at the end, including recommendations for remedial skills development where appropriate. All rotation assessments are given by a group of staff based on their professional judgement on skills and competency attainment. All rotations must be passed before sitting the final Part III exam. This exam covers applied clinical sciences consisting of four papers (all questions compulsory) and two vivas for each paper. The overall pass mark is 50 % with at least 45 % in the written papers, with merit set at 67 %. A moderation viva is given to candidates narrowly missing 50 % (48.5 – 49.5 %). All four papers must be passed for the award of the VetMB degree; external examiners are present at the viva voce examinations and review the Part III exam overall.

10.11. Additional attempts at examination over and above those normally allowed are discretionary and necessitate a written appeal by the student's College to the Faculty Board of Veterinary Medicine, accompanied by evidence of mitigating circumstances. The Medical and Veterinary Student Progress Panel reviews all appeals submitted to the Faculty Boards of Veterinary Medicine and Clinical Medicine and makes recommendations to the Faculty Boards about appeal outcomes. This ensures fairness and parity in the consideration of appeals.

10.12. Students usually qualify after six years (three preclinical years and three clinical) over a total of 18 terms. They must graduate within 92 months of matriculation, which equates to 24

terms, unless permission for extension is granted by the Faculty Board of Veterinary Medicine, following submission of evidence of mitigating circumstances.

10.12. The combination of continuous assessment in clinical rotations, assessment of clinical skills and the sequence of Part I, II and III examinations, with an increasing emphasis on scenario-based clinical reasoning, interpretation and underpinning knowledge aims to ensure a progressive development towards demonstrating attainment of Day One Competences. All students are offered formative viva examinations in the weeks before the Part III examinations and feedback is given. Post-examination individual feedback is available through a student's VSCS.

10.13. In most cases, different groups of staff mark the Part II and Part III exams and these two sets of exams are set a few weeks apart to aid management of staff workload. Written answers in Parts II and III are assessed with reference to model answers using grade descriptors. Three attempts are allowed for Final VetMB Examinations. Final VetMB Examinations are reviewed by the Teaching Strategy Committee, Veterinary Education Committee and Faculty Board. To ensure fairness, validity and reliability, question outcomes are considered statistically wherever appropriate; any which appear not to be performing well are re-assessed and removed. Fuller written answers are compared to model answers with explicit mark schemes. Tripos essays are marked according to grade descriptors. Where possible, for MCQ examinations, pass marks are set using a statistical analysis such as Hofstee plots.

10.14. Internal and external examiners are appointed by the Faculty Board of Veterinary Medicine taking into account their professional, teaching and assessment experience. Final mark sheets are compiled at meetings of all internal and external examiners. Reports on examination are discussed at Veterinary Education Committee and Teaching Strategy Committee. All examiners' comments are considered carefully and where necessary assessment practices are altered. The Education Quality Improvement Programme (EQIP) oversees all assessments and ensures that assessments are valid and up-to-date.

10.15. All examinations are assessed by external examiners who approve draft papers and report on the overall examination process. Their comments are carefully considered and, where appropriate, practice is modified. Responses to comments from the external examiners are published, together with changes implemented after consideration of recommendations.

10.16. The teaching and assessment of clinical skills is a process that spans all three clinical years, starting with basic handling skills in the 4th year and ending with refinement of clinical skills in final year rotations. Assessments are performed at key 'gateways' in the 4th year (DOPS) along with formative peer-to-peer clinical skills assessments and during the induction week to the final year (OSCE style). In the Final year students are assessed on 10 parameters including communications skills, clinical examination along with manual or technical skills. Each student receives both face-to-face and written feedback on their performance in all these areas. Day one competences are listed in the hard copy Clinical Skills checklist and are signed off by clinical staff following direct observation of the student performing each task.

10.17. In-service staff training days are held biannually and include training in assessment. Topics include writing MCQs, best practice in preparing essay and short answer questions (including model answers), giving feedback (e.g. verbal and written feedback on final year rotations). Training is open to all staff and Clinical Training Scholars and those involved in teaching,

giving feedback and assessment are expected to attend; records are kept for this training. A variety of training materials is available on Moodle. All staff delivering *viva voce* examinations in Final VetMB Examinations Part III must have undertaken in-house training, including peer-review. Internal examiners may require staff contributing to written exam questions to modify questions or model answers; this feedback and reflection provides further training in best practice. MCQ performance is evaluated using statistical analysis and reviewed by Course Organisers and question setters. Staff delivering supervisions in preclinical years undertake the compulsory Supervisors' Training, which includes aspects on assessment and feedback. Colleges provide supervision training sessions.

10.18. The University offers three Post-graduate Certificates in Education; all three include elements of assessment and examination. The Clinical School delivers an Integrated Foundations of Medical Education course that includes assessment of students in small group, clinical settings. Around 20 Department staff have attended this course, funded by the Department.

Comments

10.19. The development of a detailed Programme level assessment strategy remains an ambition of the Department, though the management team has made progress in creating one. Currently, the Programme lacks an overarching assessment framework model that articulates the relationship between the current Programme and course aims and the assessment methods.

10.20. Much assessment of clinical skills remains indirect, thus direct assessment does not form a significant component of the overall process of assessment in the clinical disciplines.

10.21. The structure of assessment means that the final grade does not represent the candidate's clinical skills achievements across the breadth of the RCVS Day One Competences. This is a consequence of many of the Competences being assessed only through a pass/fail gateway system in final year rotations. Assessment does not currently ensure that the grades awarded reflect an appropriate standard of performance by students against the relevant clinical learning objectives.

Recommendations

10.22. The Department must complete its assessment review and instigate a cohesive programme-wide assessment strategy that clearly articulates the relationship between the learning outcomes of the programme and the modes of assessment.

10.23. The assessment strategy (10.22) must ensure that direct assessment of clinical skills forms a significant component of the overall assessment in the clinical disciplines and contributes to the final grade awarded.

10.24. Progress with the above recommendations must be reported as part of the RCVS annual monitoring process.

Standard 11 – Research programmes, continuing and higher degree education

> 11.1   The veterinary school must demonstrate significant and broad research activities of staff that integrate with and strengthen the veterinary degree programme through research-led teaching.
>
> 11.2   All students must be trained in scientific method and research techniques relevant to evidence-based veterinary medicine. All students must have opportunities to participate in research programmes.
>
> 11.3   Veterinary schools must provide advanced postgraduate degree programmes, internships, residencies and continuing education programmes that complement and strengthen the veterinary degree programme and are relevant to the needs of the profession and community. Programmes and the numbers of students in them must be commensurate with the facilities, clinical and other resources and staff.

Background

11.1.   The Department of Veterinary Medicine has a commitment to the improvement of veterinary medicine through research and an international outlook. This combines with a research philosophy centred on the concept of 'One Health'. Many problems are followed at multiple levels ranging from the veterinary clinic, to the molecular and cellular, to environmental, population and socio-anthropological studies at the macro scale. The Department has particular strengths in epidemiology and disease dynamics, infection and immunity, systems pathology, oncology and genetics.

11.2.   Interactions between research leaders and staff and clinically active staff are encouraged through joint weekly seminar programmes, research days and at strategic meetings promoting joint research programmes. Particular efforts are made, through the mentorship programme, to encourage young clinical and paraclinical staff or students to conduct their research in world-leading programmes across the University, to give them the best chance to develop sustainable, well-funded, international, independent veterinary research programmes in these environments.

11.3.   The Department integrates research within the veterinary training programme at all levels from undergraduate to resident, as well as providing postgraduate research training leading to MPhil, PhD and VetMD degrees. Students are strongly directed towards evidence-based veterinary medicine throughout the undergraduate course, and all teaching is expected to be research-based. Veterinary students encounter research methodology from the start of their programme and undergraduates participate in research projects in preclinical studies, particularly in 3rd year. Veterinary clinical research forms part of the undergraduate programme, particularly through 5th-6th years.

11.4.   Year 3 research projects and dissertations (the third year of the Tripos) can be undertaken in a diverse range of Schools across the University, although most students choose Biological Sciences, and within that Biological and Biomedical Sciences, Physiology, Development and Neuroscience, Zoology or Pathology within the Natural Science Tripos. Many of these projects lead to peer-reviewed publications.

11.5.   In their clinical years, all students undertake a newly introduced VetMB Research Project as a part time activity undertaken from 4th to 6th years, which replaces previous "elective" research projects. This research project provides a more lasting and focussed commitment to research. It includes development of a research hypothesis and methodology from 4th-5th years, laboratory, clinical or field data collection and analysis, with write up and presentation

in 6th year. Again a significant proportion of these projects, which are very much student-led, result in publications.

11.6. The one year MPhil degree is a stand-alone research degree to gain experience often prior to making a commitment to a PhD, or entering specialist clinical training.

11.7. Students take either a PhD (Vet Sci) or a PhD (Biol Sci in the Dept of Veterinary Medicine). The two programmes are identical in entry, training and examination requirements. PhD projects often include clinically related topics. The Department recruits veterinary, medical and science students into research degree programmes. University fees and current funding make it more challenging to recruit veterinary graduates and around a quarter of current graduate students are veterinarians. The Vet MD programme, a part time degree open to Cambridge staff and graduates has been used by only a few.

11.8. Employing over 20 European Diplomates, all recognised specialists, the Department offers a range of approved training programs to provide structured training towards the highest standard of professional excellence, an EBVS recognised Diploma. Supervisors are experienced and highly qualified leaders of clinical teams, often also holding doctoral degrees. There are currently 20 SCTSs and numbers are increasing.

11.9. SCTSs are registered to undertake approved residency training programmes by the relevant European College. These programmes include clinical training in specified disciplines, private study, clinical research projects, attendance at service rounds, Journal Clubs and Departmental Seminars. In house training includes communication and presentation skills, giving feedback, equality and diversity training, and optional writing and presentation skills, time management, and statistics training. Scholars are expected to present at Departmental seminars, locally organized CPD events and at international meetings and to publish their research.

11.10. The Department is currently training 14 junior clinical training scholars (JCTS, 1y internship). Small animal JCTSs follow a structured programme of rotation through hospital specialty services, with formal and self-directed teaching and a clinical research project usually taking 4-6 weeks. Completed projects are presented and many are written up for conference presentation or publication. The JCTS Director advises them on appropriate sources of assistance. Each JCTS has a pastoral mentor and a designated academic mentor to support them in their future careers.

11.11. Many academics in the Department contribute individually to commercial Continuing Professional Development (CPD) courses, which are supported by the Department in that delivery is not restricted or discouraged. The Department itself hosts a limited number of CPD courses for veterinary practitioners. These include a biannual Advanced Small Animal Medicine Course and the Radiology Film Reading evening sessions during term time, which have been running for over 30 years. The Department also hosts approximately 50 visiting veterinary surgeons each year. Visitors include residents gaining additional or specialist experience as well as general practitioners gaining an intensive period of practical training. Each visitor joins one of the clinical disciplines for a period of usually one to three weeks.

11.12. The JCTSs interface mainly with the final year students on the Out-of-Hours and Critical Care rotations, as they provide first line cover for evening and overnight care of in-patients. As part

of their rotating internship, the JCTSs do assume responsibility for management of RSPCA cases whilst in the QVSH, so may interact with final year students in this respect.

11.13. The SCTSs in Medicine & Surgery see and manage the majority of the QVSH referral cases (under supervision of the Senior Clinicians), and thus it is they who mainly provide the one-to-one case based clinical experience for the students, with the Senior Clinician role more directed towards facilitating group teaching in rounds and other case discussions. This is not exclusive to every discipline; some Senior Clinicians routinely see their own cases and others become involved in client based case management discussions (with the student & SCTS) at the time of consultation. SCTSs undertake training in teaching.

11.14. Full time research students are not usually involved in student teaching. Timetabling of clinical commitments for JCTSs and SCTS takes account of research commitments, usually by allocation of blocks of time for different activities.

Table 11a: Postgraduate clinical training (interns and residents)

Clinical discipline	No. of interns	No. of residents	Diploma or anticipated title
Anaesthesia	-	3	ECVA - Diploma
Anatomic Pathology	-	2	ACVP - Diploma, ECVP-Diploma, FRCPath
Clinical Pathology	-	2	ECVCP - Diploma,
Diagnostic Imaging	-	2	ECVDI - Diploma
Internal Medicine	-	4	ECVIM - Diploma
Medical Oncology	-	2/3	ECVIM - [Oncol] Diploma
Neurology	-	1	ECVN - Diploma
Pig Health Management	-	1	EVS -Porcine Health Management
Surgery	-	3	ECVS - Diploma
Equine	2	-	N/A
Farm Animal	2	-	N/A
Small Animal	10	-	N/A

Table 11b: Postgraduate programmes

Qualification	No. of students on taught courses	No. of students by Research	Duration of training
Diploma/Specialist level			
Clinical Specialist training, (see Table 11.1.1)	20	N/A	3 years
Masters Level (incl. postgrad cert/dips)			
MPhil in Veterinary Science	0	4	1 Year
PhD/Doctorate level			

PhD in Veterinary Medicine	N/A	35	3-4 years
PhD in Biological Sciences at Department of Veterinary Medicine	N/A	12	3-4 years
Vet MD	N/A	0	Variable
Other			
N/A	-	-	-

Table 11c: Continuing education courses provided by the Department in 2017

Title of course	Number of participants	Course hours
Ultrasonography	15	1 day
Post Mortem Observation	39	1 day
Dental Health for Donkeys	100	1 day
Small Animal CPD	45	5 days
MIMICS Training Course (software used to create 3D models out of medical images)	30	2 days
Spring Hygiene Seminar	40	1 day

Table 11d: Summary of research programmes in the veterinary school

	Total # academic staff	# academic staff involved in research who teach on the professional vet degree	Total research FTE	Externally funded research grants		Number of original peer-reviewed research publications
				Number	Value	
2016-7	34.51	33.8	25.2	34	£4.216M	158
2015-6	35.56	34.36	25.2	29	£9.575M	191
2014-5	35.56	34.36	25.2	34	£6.794M	249

Table 11e: Summary of veterinary students' involvement in research projects

	# veterinary students undertaking a research project (indicate year of study)			
	# Year 3 students	# Year 4 students	#Year 5 students	#Year 6 students
2016-7	2	0	0	**45**
2015-6	3	0	0	**54**
2014-5	7	0	0	**39**

Table 11f: Numbers of veterinary students intercalating in last 3 years

	# students intercalating
2016-7	64
2015-6	56
2014-5	54

(This is the number of students taking Third Year, leading to the BA degree)

Comments

11.15.   The year three projects and dissertations provide an opportunity for veterinary students to engage in high level research in internationally acclaimed research groups, and across diverse academic fields. Veterinary students are welcomed and appreciated by the host Departments, and many students choose Cambridge based on the opportunities afforded by this year of research study.

Commendations

11.16.   The Year three study and in particular its research projects and dissertations is commended.

Standard 12 – Outcomes assessment

12.1   In the interests of quality assurance and enhancement, the veterinary school must have mechanisms to gather data routinely to demonstrate that its institutional and educational objectives are being met.

12.2   Specifically, the school must provide evidence that:

- *its strategic goals are appropriate and that it is progressing towards achieving these goals*
- *it is complying successfully with its operating plan*
- *its veterinary programme is subject to internal and external evaluation and validation processes by long feedback loops (e.g. graduate destination surveys, employer surveys) in addition to the short loops (e.g. unit of study evaluations).*

12.3   The school must provide evidence that all its graduates have (or for a new school, will have) achieved the programme's stated learning outcomes, including the level of competence required of an entry-level veterinarian (RCVS Day One Competence).

12.4   There must a system for students to keep a record of, and reflect on, their developing practical and clinical skills over the duration of programme. There must be evidence that such experience logs inform the learning and assessment process for individual students, and evidence that the school uses consolidated data to monitor the achievement of competence and experience levels of students across the programme as a whole.

12.5   There must be procedures to review the evidence of student experience and student achievement of Day One Competence, and demonstrate implementation of change on the basis of such review. Outcomes of the review process must be communicated to relevant internal and external stakeholders.

12.6   The school must have a strategy for the continuous improvement of the quality of the veterinary programme.

12.7   In the case of a school that has yet to produce graduates, evidence must be presented that provides RCVS with reasonable assurance that the school's programme outcomes will be achieved. Evidence must be available to show progress to date in achieving the desired outcomes in the programme, and the measures to be taken in the remainder of the programme to ensure their achievement by the completion of the veterinary degree.

Evaluation of outcomes is the most important source of information to a school about its success and its drive for continued enhancement of quality. However, in contrast to inputs, which are relatively easy to measure, outcomes assessment is more complex. It is easy to become confused by the fact that the same raw data can be repurposed to assess outcomes at the level of the school or at the level of the individual student. This means that everyone involved needs to be clear about the use of data and the presentation of results.

All schools with an established quality assurance and enhancement culture will evaluate outcomes at school, programme, module and individual student levels. This will be achieved through results in assessments, feedback forms of various types, surveys, publication counts and a host of other measures. Different schools will place emphasis on different measures, but a report on outcomes should include a matrix that employs a variety of different measures providing information relevant to the foci of the other standards. Repetition of the measures over an extended period (at least five years) will then demonstrate progress in each area. Specifically, evaluation of outcomes related to the veterinary programme, individual students (throughout their studies as well as at graduation) and employability must be included, but RCVS will expect schools to include other outcomes evaluations of their choice. In addition, evidence of quality assurance, together with both reactive and proactive quality enhancement will be expected.

Background

12.1.   A new post of Quality Assurance Co-ordinator was created and the post-holder was appointed in August 2017. The teaching team was restructured to include a new role of

Deputy Director of Teaching (Quality Assurance); this member of staff also chairs the Department's Education Quality Improvement Programme (EQIP) team. EQIP reports through the Teaching Strategy Committee (TSC) to the Department's Strategy and Executive Committee (SEC).

12.2. Feedback from students is collected in many ways. Nominated student representatives convey views and opinions of students through a range of committees, including:

- Departmental teaching committees (pre-clinical departments and Department of Veterinary Medicine)
- Medical and Veterinary Sciences Tripos (MVST I) Committee
- Veterinary Education Committee
- Faculty Board of Veterinary Medicine
- Faculty Board of Biology
- Student Consultative Committee (Department of Veterinary Medicine)
- Teaching Strategy Committee
- Equality and Diversity Committee

Minutes of these committees are published and made available to staff and students.

12.3. Feedback is collected about the educational programme in general through a number of student surveys on the veterinary programme, including the following:

- Focus Group meetings (4th, 5th and 6th year; held once per term)
- Leavers' survey
- National Student Survey
- Student Barometer Survey
  - A new, university-wide survey of students conducted annually in all but final year students, replacing the survey previously conducted by the Faculty of Biology
- Graduate Surveys
  - Annual surveys of graduates 1 year post graduation since 2015
  - Surveys of graduates 3-5 years post-graduation will commence in Spring 2018

12.4. Course level feedback from students is collected at the end of each course. Previous poor response rates on the Moodle system led, following consultation with student representatives, to a new system of course survey links being emailed to students via Qualtrics survey software in time for their last lecture session. A member of the QA team attends this session to promote immediate electronic completion of the surveys. Student response rates will be monitored using this new approach and the process reviewed and fine-tuned in the next year, but response rates and the quality of responses already appear to be improving.

12.5. Copies of student surveys and results are available for all teaching staff on Moodle and are discussed by EQIP at TSC. A separate QA site is being established to allow access to all data to internal staff only, to allow better coordination of internal review prior to publication of results. There are also plans to make results available to students.

12.6. A biennial employers' survey is now conducted jointly by the UK Veterinary Schools Council and RCVS. Results are discussed at TSC, and recommendations on how to respond forwarded for discussion at Strategy and Executive Committee.

12.7. The Cambridge University Veterinary Society conducts ad-hoc surveys on issues as they arise (e.g. student mental health); results are discussed in the appropriate committee and with

the Director of Teaching. Other surveys are conducted to collect data on specific initiatives relating to programme improvement, as in the 'e-learning survey' by the E-learning Working Group.

12.8.   External feedback and suggestions on the content of the curriculum is also provided by:

- External Examiners comment on exam question quality and on strength/weakness in student answers (reports, Departmental responses & changes implemented are available to teaching staff on Moodle).
- External reviews of teaching are now instigated and managed by the Director of Teaching. Farm animal and equine teaching were reviewed in 2017 and the reports presented to TSC and Strategy and Executive Committee. Future reviews will be conducted in small animal surgery, small animal medicine disciplines and in other clinical/diagnostic support areas (e.g. imaging, anaesthesia, pathology) in a systematic rolling programme of curriculum review.
- External lecturers and Associate Lecturers, most of them leading professionals, play key roles in the delivery of a number of courses including commercial poultry husbandry and medicine, exotic animal husbandry and medicine, pig husbandry and breeding, Veterinary Public Health, veterinary business management, ophthalmology. Their input helps to ensure that these curriculum components remain relevant to modern veterinary practice.

12.9.   For the RCVS Day One Competences, underpinning knowledge and understanding is assessed through the Final VetMB Examinations Parts I, II and III using a variety of assessment formats, including the following:

- Written exam papers for Parts I, II and III
- *Viva voce* examinations with external examiners in Part III
- Students' engagement with research methodology in ISBM exams in 1st Year, dissertations/projects in 3rd Year, questions in Final VetMB Examinations Part II and, in clinically-focused VetMB Research Projects in Final VetMB Examinations Part III
- Competences in animal handling and clinical practical skills are assessed at appropriate times throughout the whole course, including in 6th year rotations; students must pass these before they are eligible to sit examinations or undertake EMS
- Students are encouraged to monitor their own progress in developing competences as part of the Clinical Skills Checklist
- Evaluation of written and verbal communication skills is part of 6th year rotations.

12.10.   Two initiatives aim to ensure all course learning outcomes as well as the RCVS Day One competences are covered by the teaching and the assessment framework of the Cambridge Veterinary School:

- Mapping of the 6-year programme curriculum will inform an internal review to ensure that the curriculum is mapped in its entirety through all courses and the necessary links and cross-referencing are present.
- Review of the assessments in the Final VetMB programme will aim to ensure complete coverage of the clinical curriculum, identifying overlaps and omissions. It will

help to align timings and content of each assessment, to support transition of students during the clinical years (years 4-6).

12.11. The Clinical Skills Checklist catalogues a range of skills which must be "'signed off' by a member of staff before the student takes Final VetMB Examinations Part III. Students in all years of the course meet with their Veterinary School Clinical Supervisor (VSCS) once per term to review their progress, particularly their EMS, and are encouraged to reflect on their learning as follows:

- Students detail aims and objectives prior to each clinical placement, for VSCS approval
- Achievement of aims and objectives is discussed with the VSCS after the placement
- Students are required to write a reflective comment on their progress
- Students are required to reflect on their communication skills in at least one large animal and one small animal consultation they have witnessed in their clinical years

12.12. A student's performance in a consultation in the second of their small animal medicine rotations (in 6th year) is recorded and students reflect on how they conducted that consultation. Formative feedback on performance in clinical rotations (including Clinical Skills Centre activities) is provided in structured gateway assessments which must be completed prior to completion of each year. Students are encouraged to reflect on their progress in acquiring practical skills. In 6th year, students receive verbal feedback part-way through most rotations (allowing reflective dialogue with teachers); reflective diaries are integral to some rotations

12.13. An experiential log is also part of the Clinical Skills Checklist. Clinical skills assessments (DOPS) in the clinical years provide further structured opportunities for reflection, together with consideration of any "areas of concern" identified in final year rotations. All of these elements are discussed between the student and their VSCS who can then liaise with other relevant members of staff to support the student in their learning and progression.

12.14. The assessment components are all currently being consolidated on Moodle and will form part of a proposed Professional and Clinical Practice strand. Students and staff will contribute towards an experiential log by recording any instances where students have met the criteria of each skill or requirement. This log will include reflection elements and the criteria of each component link to the Day One competencies.

12.15. In conjunction with this, the Department is investigating more integrated e-portfolio software platforms for tracking clinical and professional skills, in order to have a repository for all student work and interactions with the programme during their six years of study.

Comments

12.16. The Department has invested in the administration of quality assurance and enhancement through the appointment of a Quality Assurance Co-ordinator in August 2017 and the restructuring of the teaching team to include a new role of Deputy Director of Teaching (Quality Assurance). Current activities include assessment review and plans to review aspects of the curriculum. The Department is in the process of establishing mechanisms to

implement more thorough outcomes assessment. It has recently instituted an operational system for quality assurance, but has limited results to report so far.

Recommendations

12.18. The Department must implement its plans for curricular and examination review and a quality management system for its activities, then report on the progress in doing this as part of the RCVS annual monitoring process.

University response

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RESPONSE

TO THE ROYAL COLLEGE OF VETERINARY SURGEONS VISITATION TO THE UNIVERSITY OF CAMBRIDGE DEPARTMENT OF VETERINARY MEDICINE MARCH 2018

OCTOBER 2018

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Standard 1 – Organisation

Recommendations

1. **The Department must proceed with the development of its operating plan, implement it and report on progress in achievement of its goals as part of the RCVS annual monitoring process.**

The Department has updated its Strategic Plan for 2018-2023 and will develop an Operating Plan in line with the key goals within its strategy. It will report this Operating Plan in 2019, review progress biannually, and include progress reports as part of the RCVS annual monitoring programme.

Standard 3 – Physical Facilities

Suggestions

2. **The scheduled improvement to Lecture Theatre 1 should be actioned and Lecture Theatre 2 should have improvements and expansion of its electrical supply to improve IT provision to the students.**

USB sockets were provided to facilitate use of electronic devices in Lecture Theatres 1 and 2 in time for the start of the 2018-19 academic year.

There were no improvements to Lecture Theatre 1 scheduled at the time of the Visitation, but since then the Department has initiated a consultation on the specifications required for an upgrade of both lecture theatres and will submit a detailed request to University of Cambridge Estate Management in 2019.

3. **Attention should be given to ensuring that supporting documents for Health & Safety, biosecurity and welfare standards demonstrate evidence of regular review.**

From the 2018-19 academic year, the Department has implemented new procedures that Health and Safety Risk Assessments (RAs) must be placed in the relevant space within its Virtual Learning Environment, Moodle (e.g. the RA for a practical is placed in the folder for that practical folder) and can be viewed by students. Copies of these RAs will be displayed in the relevant laboratory/teaching space, in paper copy for each practical. These RAs will be reviewed and re-signed annually. The new procedures will facilitate monitoring of annual review.

Infection control and biosecurity documents are now available to all staff on the Hospital section of the departmental intranet. Protocols are dated and regularly reviewed by the Hospital Infection Control Committee.

In October 2018, the Department's Animal Ethics and Welfare Committee, which reports to the Department's Strategy and Executive Committee annually, reviewed and updated the welfare protocols for use of greyhounds, horses, cattle and sheep in student teaching.

Standard 4 – Animal Resources

Suggestions

4. **Field postmortem examinations and those undertaken by clinicians as part of other rotations should be recorded in the collation of figures for post mortem examinations when seen or carried out by students.**

These data for 2017-18 have been included with Table 2 of the RCVS annual return October 2018 and will be included in future annual returns.

5. **The department should plan for additional sources of dairy cattle for undergraduate study.**

An additional clinical member of farm animal will be appointed from 1 January 2019 and this will facilitate restructuring of the herd health element of teaching across a greater number of dairy units local to Cambridge. In addition, the Department is developing a collaboration with Kite Dairy Consultants to provide access to more dairy units in East Anglia for student teaching purposes.

Standard 8 – Academic & Support Staff

Suggestions

8. **There is a strong emphasis on research outputs for academic progression. It is suggested that the Head of Department continues to work within the University to provide a stronger emphasis on consideration of teaching and clinical activities in progression pathways.**

The Head of Department joined the University's Human Resources Committee in 2016 to promote and inform exactly this type of change. The promotions round in 2018-9 has already implemented significant changes, including a near doubling in the weighting of teaching for the Professorial and Readership promotions; further changes are being consulted on during the current year. Consideration is already being given to a specific clinical element in the scoring used.

Standard 9 – Curriculum

Recommendations

9. **The Department must complete its planned curriculum review and move from the use of 'aims and objectives' to unambiguous learning outcomes at all levels of the Programme.**

The Department has implemented a policy of providing Intended Learning Outcomes at the overall programme and individual course/clinical rotation levels (including 6th year rotations) for the academic year 2018-19. These newly created ILOs will be added to the existing mapping of our curriculum against RCVS Day One Competencies. A complete list of intended learning outcomes for the didactic elements of the 4th and 5th year curriculum will be compiled by the end of the 2018-19 academic year and also mapped.

An external review of the small animal surgery and anaesthesia components of the VetMB programme will be conducted in autumn 2018. This follows earlier external reviews of farm animal medicine (2016) and equine (2017) teaching. An external review of small animal medicine will be undertaken from 2019.

A restructuring of the curriculum is planned following completion of the assessment review (see below).

The Department will also receive a University of Cambridge Learning and Teaching Review in March 2019 and will implement recommendations of that report.

10. **A cohesive framework of learning outcomes must be communicated to staff and students and underpin the constructive alignment of all content, teaching, learning and assessment activities of the degree Programme and individual units of study to the Royal College of Veterinary Surgeons Day One Competences.**

The Intended Learning Outcomes (ILOs) for each of the courses/clinical rotations in years 4-6 have been revised. This has been communicated to all staff by multiple routes. Students were also informed, including in their scheduled induction sessions at the beginning of the 2018-19 academic year. These ILOs are available on the Department's Moodle (Virtual Learning Environment) site for each course. The ILOs will be mapped to the RCVS Day One Competencies; this mapping document will be available to both staff and students. This mapping document will be updated regularly as session-specific ILOs are provided during 2018-19.

The University programme specification template is currently being updated, and once this is completed, the updated specification for Pre-clinical and Clinical courses will be written by early 2019. These will include Programmatic Intended Learning Outcomes (PILOs) for the full 6-year veterinary degree course at Cambridge.

To aid alignment of assessment to taught content, and to ensure assessment clearly maps to RCVS Day One Competencies and Programmatic ILOs, a policy that all questions submitted for use in summative VetMB examinations must indicate the ILOs relevant to that question has been introduced for 2018-19.

11. **Progress on the above must be reported as part of the RCVS annual monitoring process.**

Progress will be reported as part of the annual monitoring process.

Standard 10 – Assessment

Recommendations

12. **The Department must complete its assessment review and instigate a cohesive programme-wide assessment strategy that clearly articulates the relationship between the learning outcomes of the programme and the modes of assessment.**

A Departmental Assessment Away Day was held in May 2018 and clear recommendations for a major restructuring of a cohesive programme-wide assessment strategy were discussed and agreed. An implementation working group will report a detailed action plan and roadmap proposal by March 2019 with the aim of introducing a revised assessment programme starting 2020-21. An e-portfolio will form part of this assessment programme. The revised programme-wide assessment strategy will articulate clearly the cohesive, relationship between the learning outcomes of the programme and the modes of assessment.

13. **The assessment strategy (Standard 10, paragraph 10.22) must ensure that direct assessment of clinical skills forms a significant component of the overall assessment in the clinical disciplines and contributes to the final grade awarded.**

This will be implemented within the new assessment programme (see #12). OSCE-like evaluations have been conducted as part of the induction to final year programs since 2016 and students are required to pass all of these before starting the relevant final year rotation(s). A system of formative OSCEs at the end of year 4 and more formal summative OSCEs at the end of year 5 will be piloted in 2018-19 with a view to incorporating them within the new assessment programme (e.g. as one element of the VetMB Final Examinations Part II at the end of year 5), together with a prescribed range of DOPS assessments within year 6 rotations. The need for recurrent resource to facilitate and support the introduction and delivery of such assessments will be discussed with the internal Learning & Teaching Review 2019 and a bid made to the University Strategic Planning Round 2019.

14. **Progress with the above recommendations must be reported as part of the RCVS annual monitoring process.**

Progress against the recommendations will be reported as part of the annual monitoring process.

Standard 12 – Outcomes Assessment

Recommendations

15. **The Department must implement its plans for curricular and examination review and a quality management system for its activities, then report on the progress in doing this as part of the RCVS annual monitoring process.**

A Quality Assurance Co-ordinator was appointed in August 2017 and the Education Quality Improvement Programme (EQIP) group expanded with an updated remit. An enhanced programme of annual course monitoring and review was implemented in 2017-18. A Quality Assurance Action Plan

has been established incorporating feedback comments from RCVS visitations, students, staff and other stakeholders. Reports on progress with this Action Plan are reported by EQIP to the Teaching Strategy Committee.

The EQIP team has led the implementation of incorporations of ILOs into the programme that are described above. Since March 2018, the EQIP team has also progressed work on the following:

- *A revised Peer Observation scheme that will be piloted with certain 4th year lecture courses during Michaelmas Term 2018*

- *Production of standard operating procedures for various aspects of QA work*

- *An extensive course monitoring process, which includes data from many different sources; the QA Co-ordinator meets every course organiser in person to discuss how the course went in the previous year (including student feedback) and to record action points for the following year – these are all clearly documented*

- *Continued work on gathering feedback from graduate students one year post graduation*

- *Regular meetings with staff to ensure that information on QA activities is disseminated to the teaching community*

- *Continuing work on an e-portfolio for students, with a view to running a pilot during the coming academic year prior to the introduction of an integrated Professional and Clinical Practice Strand that will span all 6 years of the curriculum*

Reports on implementation of curricular and examination reviews, and evaluations of the effectiveness of measures introduced (quality assurance), will continue to be reported as part of the RCVS annual monitoring process.