Certificate in Laboratory Animal Science

Please view the general documents to obtain copies of:

Timetable  
B.1: Guidance Notes for candidates on general requirements.  
G: Role of Advisers to Certificate Candidates.

The following papers are enclosed:

B.2: Specific Guidance Notes for the Certificate. These notes explain what is required in terms of experience and in terms of the content of the Certificate examinations.

C: Syllabus and Commentary for the Certificate.

D: Reading list.

E: Application Forms E.1A, E.2.

E.1A - for specific details of practice

E1B - Details of Veterinary Centre in which gaining experience

E.2 - for final approval of experience and for permission to submit an entry to the examination

A copy of the most recent Examination Question Paper is enclosed for your information.

April 2010
The Royal College of Veterinary Surgeons
Specialisation and Further Education

THE CERTIFICATE IN LABORATORY ANIMAL SCIENCE

SPECIFIC GUIDANCE NOTES FOR CANDIDATES
[These notes must be read in conjunction with the B1 General Guidance Notes to Candidates]

MEMBERSHIP OF THE ROYAL COLLEGE OF VETERINARY SURGEONS

1. It is **not** a requirement of the Laboratory Animal Science Board that candidates entering for the Certificate are Members of the Royal College of Veterinary Surgeons (MsRCVS), although they will need to hold an approved veterinary degree.

AIM

2. The Board urges candidates to attend as many appropriate short courses as possible, and to join relevant associations and attend their meetings - thereby making useful contacts with a view to gaining additional experience. The aim for the general practitioner is to have sufficient experience to be credible in a laboratory situation, e.g. in the handling of animals, identification of diseases, and advising in the light of the needs of the laboratory and the animals. The practical aspect is particularly important at Certificate level: if, for example, candidates are not able to demonstrate their proficiency in practical handling and sexing of laboratory animals, they may fail the whole examination.

3. The Board wishes to emphasise to candidates the importance of the requirement of a candidate's familiarity of basic husbandry and of the ability to demonstrate competence in the handling techniques of appropriate species.

SPECIFIC EXPERIENCE

4. Entry to the examination is restricted to those who have been veterinary graduates for at least two years.

Approved Centre Route:

5. Candidates following the approved centre route will not be permitted to enter for the examination until they have been Member of the College or held an approved veterinary qualification for **at least two years** and have gained experience in the subject over **at least one year full-time** or **two years' part-time**.
6. Applications for approval of a Centre must be made directly by the Centre to the RCVS and not by the candidate. An application form can be obtained from the RCVS, where applicable.

Approved Practice Route

7. Candidates following the approved practice route will not be permitted to enter for the examination until they have been Members of the College or held an approved veterinary qualification for at least three years, and have gained experience in the subject over at least two years or three years part time.

8. Details should be provided on the candidate application form about the veterinary practice or other area of veterinary employment where the applicant is gaining experience by, for example, holding consultancy/advisory appointments - giving advice to breeding establishments, research institutes, etc., - and being involved in the care and treatment of laboratory animals generally including small exotic animals - see syllabus and commentary thereon. It should be recognised that all species of animals commonly met in general practice can be laboratory animals, thus contributing to relevant experience, but that additional experience and training would be required in the commonly used small rodents, rabbits, etc., and in the general concepts of laboratory animal science.

9. There is no separate application Form other than the candidate application forms enclosed within this Information Pack. Practices are approved for each individual candidate.

10. The Board has discretion to increase the requirements for experience for any candidate above the minimum specified if it is considered to benefit the candidate.

11. Experience offered must have been obtained within the previous five years, or after enrolment, and no period of experience can be offered to meet the requirements for more than one RCVS Certificate/Diploma. Applicants should, preferably, be studying for no more than one qualification at a time.

12. Prospective experience is permitted for this Certificate and is taken as the period up to the time of the written examination in July.

THE EXAMINATION

13. The examination consists of three Sections:

   (a) Submitted work comprising a Case Book in two Sections. Section 1: 'A Diary Log' and Section 2: 6 Cases.
   (b) TWO x 2 hour written papers, and
   (c) an oral and practical examination.
SUBMITTED WORK FOR EXAMINATION

Number and Format

14. **Section 1: The Diary Log.** This should cover a concise account of activities that represent the candidate’s involvement in laboratory animal science over a 6 month period if working part-time OR a 2 month period if working full-time and should **not** bear the candidate’s name.

15. The ‘diary log of events’ section should reflect the candidate’s frequent attention to the health and welfare of laboratory animals and, in this respect, should give a clear perspective of the number of times animal facilities were visited and the purpose of each visit, i.e. whether it was for a routine visit or for a specific incident. Mention might also be made of problems presented by stock animals, and the conduct of routine visits. An important element of the submitted work is that it should also include details of any scientific meetings and courses attended, and will also mention specific advice given to research workers and the management at the establishment on animal health and welfare matters in general. This section of the submitted work should not solely be a record of medical or surgical case histories, but should reflect the totality of observations, advice, and actions that demonstrate regular active participation in a health and welfare service for laboratory animal species.

16. **Section 2: The 6 cases.** These should also **not** bear the candidate’s name, and must reflect a candidate’s regular participation in work concerned with laboratory animal species.

17. It is also essential to explain in some depth how problems were approached and resolved, and for this purpose the second, separate, section of the case book will comprise an account of at least six events that will be recorded and discussed in more detail, and outline what type of problem(s) the work presented. Events should be selected which are examples of laboratory animal sciences rather than general veterinary medicine. Each of the 6 case events should be approximately the length of a short communication i.e. 500 - 1000 words including references and illustrations where appropriate, to reflect the range of the types of events from a candidate’s total experience and/or the range of duties of ‘The Named Veterinary Surgeon’ e.g.

   i. a clinical case ii. a management case iii. provision of a training course iv. Advice to Licensees.

18. The form of the records contained in the case book will depend on the confidentiality that is judged to be necessary. It is recognised by the Board that veterinary surgeons who are employees or consultants for commercial firms may find some imposed constraints in reporting, because public knowledge or perceptions of certain events could lead to legal, financial or other damage to the client’s reputation or finances. It is the Board’s belief, however, that it should be possible to submit a case report in a
manner that assists the assessment of the candidate's experience and capabilities but in a way, which does not compromise the interests of the client or employer. The candidate is advised to consider this requirement and, if appropriate, discuss confidentiality with the employer or client. The Board can also offer advice on this matter on an individual basis.

19. No names or other means of identifying premises or persons should be used in the casebook. **Candidates are asked to submit an electronic version of their submitted work together with their hard copy.** This will be retained at RCVS unless requested by the examiners for purposes such as checking the word count. The electronic version should be Microsoft Office 2000 or XP compatible and should be submitted on CD. Please ensure that the disks are easily identifiable by placing them in an envelope with your name, and ‘Electronic version of submitted work for Certificate in Laboratory Animal Science’ marked clearly on the front.

**Word Count**

20. Each of the 6 case events should be approximately the length of a short communication i.e. 500 - 1000 words per case (maximum of 6,000 words excluding references appendices and tables).

**Grading Scheme**

21. The submitted work will be graded “Good Pass”; “Pass” or “Fail”.

<table>
<thead>
<tr>
<th>Case Book</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Diary Log</td>
<td>10</td>
</tr>
<tr>
<td>ii. 6 Cases</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total Marks</strong></td>
<td>100</td>
</tr>
</tbody>
</table>

22. Certificate work that achieves a “Good Pass” may be used as an example for prospective candidates.

**Written Examination**

23. Candidates are warned that answers should be given specifically and that illegible handwriting may result in examiners being unable to award marks for information which candidates intended to convey.

**Format**

24. This section of the examination consists of TWO written papers. Paper I (2 hours) will consist of 4 out of 6 essay-type questions and Paper II (2 hours) will consist of 12 compulsory questions.
Marks Scheme:

25. Paper I will be marked out of 50 marks
   Paper II will be marked out of 50 marks
   Total Marks for this Section (b) = 100 marks

ORAL AND PRACTICAL EXAMINATION

Format

26. The oral and practical examination lasts for one hour for each candidate and is
    composed of three parts. Candidates will be expected to have a thorough knowledge
    of infectious diseases. This will apply to either the Practical or the Spot tests.

27. Section 1: Spot tests consist of a selection of 35 mm colour slides, photographs, items
    of equipment and other material relevant to the broad field of laboratory animal
    science and technology. Candidates are asked written questions based on this
    material. Normally 10-15 short-answer questions are set.

28. Section 2: Requires that the candidate demonstrates practical abilities in animal
    handling. Typically, candidates are required to handle and restrain a range of
    common laboratory species. Candidates will be asked to assess the age, sex and the
    bodyweight of the animals and describe simple clinical manipulations.

29. Section 3: The oral examination is conducted by all examiners, who assess the
    candidates' knowledge of laboratory animal science. Some questions in this section
    may arise from material in the case-dairy provided by the candidate.

Marks Scheme

30. Spot Tests will be marked out of 25 marks
    The Practical will be marked out of 25 marks
    The Oral examination will be marked out of 50 marks

    TOTAL Mark for this Section (c) = 100 marks

31. A candidate will be required to gain at least 50% in this Section of the examination.

SYLLABUS AND READING LIST

32. There is a brief commentary on the syllabus, which gives an indication of the
    standard of achievement required of candidates.

33. In view of increased access to the Internet, and the ready availability of on-line
    literature searches, the existing reading list was frozen in 2002. In 2-3 years' time
    the list will be withdrawn altogether. In future, candidates will be expected to do
their own research and are encouraged to seek advice on suitable reading matter from their advisers or through the Royal College of Veterinary Surgeons Library and Information Service.

Advisers

34. Candidates are advised to look in the back of the RCVS Register of Members for the names of Certificate and Diploma Holders of Laboratory Animal Science and seek their agreement to act in this capacity, prior to enrolment or to obtain a list from the Board Secretary.

35. It is strongly recommended that all candidates have at least one talk with an adviser during the course of their studies, particularly one who has been an Examiner for the Certificate in Laboratory Animal Science.

Attendance at Short Courses

36. Meetings of interest to candidates are, of course, arranged by the Laboratory Animals Veterinary Association and other scientific associations. Dates of these meetings and the courses mentioned above are included in the Calendar of Events, which is published in "In Practice" and in the "Notes and Comments" section of the journal "Laboratory Animals".

Additional Information Relating to this Qualification

37. The following organisations offer short or modular courses of interest to candidates for the RCVS Certificate and Diploma in Laboratory Animal Science: -

   Laboratory Animals Veterinary Association (LAVA). Short courses related to RCVS syllabuses.

   Royal Veterinary College, University of London - Laboratory Animal Science Unit, modular course for MSc in Laboratory Animal Science - individual modules can be taken, or single lectures or series of lectures on a particular topic.

Membership of Veterinary Associations/Societies

38. Enrolled candidates are encouraged to become Members of relevant societies and associations e.g. Laboratory Animal Veterinary Association, and attend meetings. Please contact the LAVA secretary for further information.

secretary@lava-vet.org
ABBREVIATION FOR QUALIFICATION

39. Successful candidates are permitted to use the abbreviation “CertLAS” after their names, in the RCVS Register and Directory, on practice plate, stationery, etc.

SYLLABUS FOR THE CERTIFICATE EXAMINATION IN LABORATORY ANIMAL SCIENCE

1. INTRODUCTION

1.1 The Syllabus and reading list for the Certificate of Laboratory Animal Science is intended to guide candidates to a course of study which will extend the knowledge gained as undergraduates and practitioners into the specific practical and scientific aspects of veterinary work with animals produced and used for scientific purposes.

1.2 The level of competence and depth of knowledge required to pass the examination will be that which could be reasonably expected of a veterinary graduate of 3 years standing with appropriate post-graduate experience, as defined in the byelaws, who has carefully studied the publications in the reading list and who has continued their professional development by reading of relevant journal articles and attendance at courses such as those run by LAVA or LASA.

1.3 It is the College’s aim that holders of the Certificate in Laboratory Animal Science will be recognised by scientists, technicians and others working with laboratory animals as being as competent in the giving of advice on health and welfare as would be expected of veterinarians giving advice to a farmer or pet-owner. Certificate holders should be fully able to fulfil the duties of a Named Veterinary Surgeon as laid down by the College.

2. SUBJECTS IN THE SYLLABUS

2.1 The biology, nutrition, management and husbandry of laboratory animals.

2.2 Laboratory animal breeding, including principles of genetics and practical aspects.

2.3 Diseases of laboratory animals.

2.4 Ethical and legal aspects of work with laboratory animals, including a detailed understanding of the Animals (Scientific Procedures) Act 1986.

2.5 Anaesthesia, analgesia, surgery and common experimental and husbandry procedures performed on laboratory animals. The main uses of laboratory animals.

2.6 Candidates must be competent in handling, sexing and estimating the age of common laboratory animals. Candidates who fail to demonstrate such competence are liable to fail the whole examination irrespective of marks gained in other sections.
3. **SPECIES TO BE STUDIED**

Candidates should aim for a detailed knowledge of the areas covered by the syllabus for the following species:

- Rat
- Mouse
- Rabbit
- Guinea Pig
- Hamster

Species less commonly encountered will be examined with respect to important applied aspects for example:

- Primates (ethical aspects, environmental enrichment, zoonoses)
- Gerbils, ferrets, non-mammals (including invertebrates) (common and important diseases, basic husbandry, main uses)

Species covered by the veterinary undergraduate curriculum which are important in the laboratory (dog, cat, sheep, goat, pig) are also included. Candidates should concentrate on those aspects relevant to the use of these animals as laboratory species.

4. **COMMENTARY ON THE SYLLABUS FOR THE CERTIFICATE IN LABORATORY ANIMAL SCIENCE**

4.1 **Biology, Nutrition, Management and Husbandry**

Candidates should understand the taxonomy of laboratory animals and be familiar with their anatomy and physiology in so far as this has clinical relevance. Candidates must be able to recognise normal structures both in life and post-mortem and know the variation in normal anatomy between species, with age and stage of oestrus etc.

Practical aspects will be emphasised in the examination. Candidates are much more likely to be asked about the venous drainage of the rat's tail or the rabbit's ear than about structures not used for procedures or which are unaffected by common or important disease processes.

Similarly study of laboratory animal physiology should concentrate on those aspects with practical relevance such as heart rates, tidal volumes, blood volume etc. Candidates must know the basic breeding biology of laboratory species.

Nutrition should be studied with respect to what animals naturally eat and what they are fed in laboratories. The physical presentation of diets, alterations during processing and storage and species variation in nutritional requirements, where these impact on clinical disease are the important aspects.

Management and husbandry of laboratory animals requires detailed study. Candidates must have a sound knowledge of animal house design, ventilation,
heating and lighting; the design and construction of cages, racks, space requirements, bedding, etc.

Candidates must be familiar with different management systems (barrier, conventional) and how personnel must use such systems. Important relevant legislation such as the Health and Safety at Work Act should be understood.

The principles and practice of gnotobiosis, quality of laboratory animals, quality control of animals, bedding and diet should be understood.

4.2 Breeding and Genetics

Candidates must know the principles and practice of the breeding of common laboratory species, including breeding systems, interpretation of vaginal smears, breeding data, record systems.

Practical genetics, such as definitions of inbred, congenic, coisogenic strains etc and the genetic monitoring of these must be understood.

Candidates will be expected to have a good basic understanding of genetically manipulated animals.

4.3 Diseases of Laboratory Animals

The Syllabus covers the full range of laboratory animal diseases, should be studied in depth with particular attention to important or common diseases.

Candidates are not expected to know details of viral morphology, histopathology or bacteriological diagnosis, but will be expected to recognise necropsy lesions of common diseases and these may well be presented with confirmatory histopathology in the practical examination.

Principles of disease monitoring, zoonotic disease, principles of prevention and control are particularly important.

The examination may include important laboratory animal diseases which have received recent prominence in the general veterinary press.

In addition a broad, but less deep knowledge of less commonly encountered species and less important diseases is required. For these the examination will concentrate on principles of diagnosis, treatment, control and prevention of disease in the less commonly encountered species.

4.4 Ethics and Law

Candidates must have a thorough understanding and have extensive knowledge of the Animals (Scientific Procedures) Act 1986 and its interactions with the relevant portions of the Veterinary Surgeons Act 1966.

A less detailed knowledge, but sound understanding of any other UK or European legislation affecting laboratory animal work is required.
For example:

- Health and Safety at Work
- Good Laboratory Practice
- Protection of Animals Act
- Transport regulations etc
- Guidelines published in Journals such as Laboratory Animals or the Veterinary Record should be studied.

Candidates should understand the ethics of using animals in experiments, in particular the principles of reduction, refinement and replacement and the application of cost/benefit analysis to judging the acceptability of research projects.

4.5 Anaesthesia, Analgesia, Surgery, Common Procedures and Uses of Laboratory Animals

Candidates will be assessed for their ability to give advice to licensees on suitable anaesthetic and analgesia regimes, perioperative care, operative technique. They are expected to be familiar with common procedures ranging from simple gavage to bile duct cannulation. In the practical examination recognition of commonly used equipment is a frequent requirement.

5. SUMMARY

A list of subjects composing a Syllabus can appear daunting. It is important therefore to stress that the Certificate Examination is intended to be within the reach of a general practitioner involved in laboratory animal work. The examination will assess whether the candidate has studied the publications in the reading list, is familiar with important recent developments in the field is a competent and sympathetic handler of laboratory animals and is able to fulfil the requirements of the College's guidance for Named Veterinary Surgeons. Candidates who meet these criteria will be successful.

Originated Sept. 1988
Revised May 1991
Revised November 1995
Revised November 1997
Revised November 2001
CERTIFICATE IN LABORATORY ANIMAL SCIENCE

Candidates should note that the reading list for Laboratory animal Science was frozen in 2002 and will eventually be withdrawn. Candidates are expected to research the literature for themselves and are recommended to make use of the RCVS Library and Information Service for this purpose (http://www.rcvslibrary.org.uk, e-mail - library@rcvs.org.uk or telephone 020 7222 2021). Candidates should also seek advice on suitable reading matter from their advisers.

Suggested reading list for candidates for the Certificate in Laboratory Animal Science.

A. Guidelines, Policy Statements, etc

Animal Procedures Committee Reports


Home Office publications as is but reference the Home Office web site: www.homeoffice.gov.uk/abcu.htm
Contains information about the Animals (Scientific Procedures) Act, 1986 and application forms Certificate of Designation, Personal and project licences which should be obtained and read by candidates.


RCVS WORKING PARTY REPORT (1994) The use of animals in clinical teaching and Research. RCVS


‘It should be recognised that legislation can change, as can the Home Office guidance on and interpretation of legislation. Therefore candidates must appreciate that they should make every effort to keep up-to-date with current legislation and guidelines as they will be questioned on the latest versions in the examination.’

B. Textbooks (* = Required Reading)

(N.B Many of these books are essentially reference books for preparing for the exam)


C. Important Published Papers


Baker d g (1998) Natural Pathogens of Laboratory Mice, Rats and Rabbits and their effects on Research. Clinical Microbiology Reviews, 11,2, pp 231 - 266


BVA/FRAME/RSPCA/UFAW JOINT WORKING GROUP ON REFINEMENT (1993) Refinements in rabbit Husbandry. Laboratory Animals 27,301 - 329


MORRIS T H (1995) Antibiotic therapeutics in laboratory animals. Laboratory Animals 29,16


D. Journals for Regular Reading

BLAVA Briefing. The official publication of the British Laboratory Animal Veterinary Association.


Laboratory Animals. Publ. by Royal Society of Medicine Press for Laboratory Animals Ltd.

Laboratory Animal Science. Journal of the American Association for Laboratory Animal Science.
Useful Websites:
Animal Procedures Committee (contains all recent publications): http://www.apc.gov.uk
Boyd Group: http://www.boyd-group.demon.co.uk
Home Office Animal Procedures Section (includes latest versions of all codes of practice and other documents): http://www.homeoffice.gov.uk/ccpd/aps.html
Laboratory Animals Limited (articles on refinement and links to a number of resources): http://www.lal.org.uk/laban.html
RCVS: http://www.rcvs.org.uk

Originated circa 1983
Revised February 1991
Revised November 1995
Revised December 1996
Revised November 1997
Revised November 1998
Revised November 2000
Revised November 2001
Details of the veterinary practice or other veterinary centre in which experience is being gained over at least two calendar years to meet the requirements of the byelaws for the Certificate in Laboratory Animal Science:

(If more than one practice or centre please photocopy this form and complete in respect of each such practice)

Points to consider if applying under the ‘Approved Centre’ route:

Key requirements for recognition as an Approved Centre are:

a. A candidate should be working primarily in the subject (full time of at least 30 hours per week)

b. There should be a suitably qualified colleague present to supervise training (e.g. Diplomate or Specialist).

c. The caseload should be of sufficient quantity and quality (e.g. to occupy at least two persons full time)

d. There should be appropriate ancillary support facilities (e.g. laboratories, equipment or instruments necessary for the specialty)

e. There should be adequate library facilities.

1. Name of practice or centre and address

2. Date of joining the practice or centre
   (and date of leaving if appropriate)
3. Please describe the nature of your duties, which are relevant to the syllabus for the Certificate (see also para.3 of the Supplementary Notes). You should give a resumé of the type of experience being gained, which you consider relevant, and include a list of the species encountered, and the approx. numbers of animals with which you are concerned in regard to their care and treatment, including any surgical treatment.

4. Please state the approximate percentage of your working time which is spent as described above.

5. Please list below any other involvement in laboratory animal science, including membership of relevant associations, attendance at short courses, meetings, symposia, etc. (If you are, at the same time, submitting form E.2, you need not complete this section of this form.)
6. Please state where and how you have been/are obtaining the necessary experience in the field of laboratory animal science as a veterinary surgeon over periods of time (Please refer to Document B.2) which may be:

(i) in general practice or other veterinary centre over at least two calendar years YES / NO

If YES, please complete attached Form E.1A

(ii) in a veterinary centre over at least one calendar year on a full-time basis YES / NO

If yes, please complete Form E.1B

You are asked to describe your experience in such a way that the Board can assess its adequacy in terms of the syllabus.

Please state here the period(s) of experience to be offered for the Certificate examination (from/to):

Signature

__________________________________________________________

Date

__________________________________________________________
E.1B

Details of the veterinary centre in which experience is being gained on a full-time basis over at least one calendar year to meet the requirements of the byelaws for the Certificate in Laboratory Animal Science:

(If more than one centre please photocopy this form and complete in respect of each such centre)

1. Name of veterinary centre and address

2. Description of your post (i.e. title) and date of taking up employment at the centre (and date of leaving if appropriate):

3. Names of senior colleagues (and positions held) to whom reference MAY be made by the Board:

4. Brief description of the work of the centre, including the species held and their approximate numbers:
5. Description of your personal involvement in the work of the centre as relevant to the syllabus for the Certificate:

6. Brief description of your other duties:

7. Note of any veterinary work undertaken prior to joining the centre. Give dates and a brief description in each instance.

8. Please state where and how you have been/are obtaining the necessary experience in the field of laboratory animal science as a veterinary surgeon over periods of time (Please refer to Document B.2) which may be:

   (i) in general practice or other veterinary centre over at least two calendar years YES/NO

   If YES, please complete attached Form E.1A

   (ii) in a veterinary centre over at least one calendar year on a full-time basis YES/NO

   If YES, please complete Form E.1B
You are asked to describe your experience in such a way that the Board can assess its adequacy in terms of the syllabus.

Please state here the period(s) of experience to be offered for the Certificate examination (from/to):

Signature

Date
CERTIFICATE IN LABORATORY ANIMAL SCIENCE
Application for FINAL approval of experience and for permission to submit an entry to
the next examination
to be completed and returned to the RCVS, Belgravia House, 62-64 Horseferry Road,
London SW1P 2AF by 1 November prior to the examination which you wish to enter.
NO LATE APPLICATIONS WILL BE ACCEPTED.

1. TITLE ____________________________

2. NAME in full (block letters) ____________________________

3. DEGREES/DIPLOMAS/CERTIFICATES ____________________________ in abbrev.form

4. ADDRESS for all correspondence (block letters) ____________________________

                           ____________________________
                           ____________________________
                           ____________________________

5. TELEPHONE NO(s) for contact during day ____________________________
   FAX NO(s) for contact during day ____________________________
   EMAIL ____________________________

6. DATE OF ENROLMENT ____________________________ (MONTH/YEAR)

7. PERIODS OF EXPERIENCE BEING OFFERED to meet the requirements of the byelaws
   (a) Part-time: (where the applicant is gaining experience over a period of at
       least two calendar years (or the equivalent cumulative period) by, for
       example, holding consultancy/advisory appointments and being involved
       in the care and treatment of laboratory animals generally including small
       exotic animals)
   (b) Full-time: (over at least one year)
If there has been any change in the work-load of the practice/centre, or in your personal work-load, since you applied for enrolment, please give details below:

8. ATTENDANCE AT RELEVANT SHORT COURSES

Title of course attended: __________________________________________

Dates and venue: ________________________________________________

9. OTHER INVOLVEMENT IN RELATION TO LABORATORY ANIMAL SCIENCE

List any attendances at relevant congresses, conferences, meetings, symposia, etc., with dates:

Please send a photocopy of your RCVS CPD Record Card covering the period of experience being offered)
10. **PUBLICATIONS/ARTICLES/PAPERS/LECTURES**
   Give details below (including any involvement in the instruction of others):

11. **OTHER POSTGRADUATE STUDIES**
   During the period of experience being offered, have you been or are you studying for any other postgraduate qualification? **YES / NO**
   If yes, please give brief details:

12. **I HEREBY APPLY FOR APPROVAL OF EXPERIENCE AND FOR PERMISSION TO SUBMIT AN ENTRY TO THE NEXT CERTIFICATE EXAMINATION IN LABORATORY ANIMAL SCIENCE.**
   I certify that the period of experience being offered has not been/is not being offered to meet the requirements of the byelaws for any other RCVS Certificate or Diploma.

13. **CONFIRMATION OF INTENT TO SIT THE EXAMINATION**
   If approval of experience is granted, I do/do not (delete as appropriate) intend to submit an entry to the next examination.

   Signature ___________________________ Date ______________________

   **Please enclose SAE for acknowledgement**
THE FOLLOWING SECTION SHOULD BE COMPLETED BY YOUR ADVISER.

I confirm that I am acting as this candidate’s Adviser.

Name

(block capitals)

Signature Date

______________________________ ________________________________
Candidates are required to answer **ALL TWELVE** of the following questions.

Allow 10 minutes per question.

Illegible handwriting or failure to answer the question in the form requested may result in examiners being unable to award marks for information which candidates intended to convey.

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1. **Briefly outline** the statutory responsibilities of the Named Veterinary Surgeon (NVS) in relation to acquisition and use of veterinary medicines within a research establishment.

2. **Write short notes** on the key husbandry requirements and main laboratory uses of:
   (i) gerbils
   (ii) zebrafish.

3. **Outline** the **advantages and disadvantages** of automated blood sampling in rats.

4. Give **TWO examples** of immunodeficiency in mice, explaining the nature of the defect in each case.
   **List** methods available for sterilisation of materials entering an isolator housing immuno-deficient rodents.

5. **Outline** suitable methods of euthanasia as listed in Schedule 1 of the Animals (Scientific Procedures) Act 1986 for:
   (i) a 3Kg NZW rabbit.
   (ii) a 250g rat.
   (iii) an adult rainbow trout.

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P.T.O. for Questions 6 - 12
6. **List** common hazards to personnel encountered when working in an animal unit. Choosing **ONE example**, explain what steps may be taken to control the risk posed to staff.

7. Write **short notes** on:

   (i) Indwelling intravenous catheter care in beagle dogs undergoing chronic drug infusion in toxicology studies. **OR**

   (ii) Rodent models of diabetes mellitus.

8. Suggest a suitable anaesthetic & analgesic protocol for:

   (i) Cranial implant surgery in the Lister Hooded rat.
   (ii) Telemetry implantation in the beagle.
   (iii) Embryo transfer in mice.

9. **List** differential diagnoses for the following:

   (i) Diarrhoea in marmosets.
   (ii) Hair loss in guinea pigs.
   (iii) Wasting disease in athymic mice.

10. Define “inbreeding” in the context of laboratory rodents. Write **short notes** on the genetic characteristics of inbred lines, and the **advantages and disadvantages** of using inbred rodents in research.

11. Write **short notes** on **TWO** of the following:

    (i) Distemper in ferrets.
    (ii) Tyzzer’s disease in rabbits.
    (iii) Sialodacryoadenitis virus infection in rats.

12. What provision does the Animals (Scientific Procedures) Act 1986 make in relation to potential conflicts of interest over care of animals which have undergone regulated procedures at a designated establishment?
 Candidates are required to answer **FOUR** of the following **SIX** questions.

Allow 30 minutes per question.

Illegible handwriting or failure to answer the question in the form requested may result in examiners being unable to award marks for information which candidates intended to convey.

1. **Outline** the principal methods by which genetically modified mice are created. **Discuss** the major ethical and welfare concerns associated with the use of genetically modified mice and how ‘best practice’ may be applied.

2. **Discuss** the importance of environmental control in the animal unit. How do environmental factors impact on animal well-being and quality of research?

3. On a routine visit to a rodent breeding facility (genetically altered, inbred and outbred), the NACWO informs you that there appears to be an increase in neonatal and/or pre-weanling mortality. **Discuss** your preliminary investigation of this problem, the differential diagnoses you would consider, and further testing or investigation you would conduct to determine the cause.

4. **Discuss** how proposed changes to European Union Directive 86/609 may impact on use of animals in biomedical research in the United Kingdom.

**P.T.O. for Questions 5 and 6**
5. **As Named Veterinary Surgeon (NVS) you are advising a project licence applicant planning an imaging study of tumour growth in rats.**

Briefly, adult rats will undergo laparotomy under anaesthesia for injection of tumour cells into the liver. They will be monitored for 6 weeks, during which time they may have blood withdrawn, drugs administered to influence tumour growth, and MRI scanning to monitor tumour growth. At the end of the procedure they will be terminated by a Schedule 1 method or by perfusion fixation under general anaesthesia.

**Discuss** your advice in relation to potential adverse effects that should be included in Section 19b (vi), along with methods of prevention and control, and humane endpoints that should be applied.

6. **How may 'quality of life' be improved for cynomologus macaques imported for use in regulatory toxicology studies?**

**List** the principal diseases of zoonotic concern for staff engaged in the care and use of such animals and **outline** how you would manage the risk of **ONE** such disease.