

The Royal College of Veterinary Surgeons
Specialisation and Further Education

THE DIPLOMA 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 Diploma are Members of the Royal College of Veterinary Surgeons (MRCVS), although they will need to have graduated with an approved veterinary degree.

SPECIFIC EXPERIENCE

2. Candidates must have spent a period of time, as defined below, by the time of the examination, having substantial involvement in the field of laboratory animal science.
3. Candidates may gain experience for a Diploma:
 - (a) at an approved centre for their subject
 - or
 - (b) at an approved practice.

Approved Centre Route

4. Candidates following an approved training programme at an approved centre 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 four years** and are required to offer experience in the subject over **at least four years**.
5. At present, there is no separate application form for approved centres for this Diploma, other than the candidate applications forms enclosed within this Information Pack. Centres are approved for each individual candidate.

Approved Practice Route

6. 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 five years** and are required to offer experience in the subject over either:
 - (a) **at least five years including 200 days spent at an approved centre,**

OR

(b) **at least six years** if gaining experience solely at an approved practice.

7. At present, there is no separate application form for approved practices, other than the candidate applications forms enclosed within this Information Pack. Practices are approved for each individual candidate.
8. 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.
9. Experience accepted for the Certificate will count towards the experience required for the Diploma, at the discretion of the Board, whether the candidate is at an approved centre or an approved practice.

THE EXAMINATION

10. The examination consists of three Sections:

- (a) A Dissertation OR 5 Published Papers
- (b) TWO x 3 hour written papers, and
- (c) a clinical, oral and practical examination.

SUBMITTED WORK FOR EXAMINATION

Dissertation OR Published Papers

11. As part of the Diploma examination, candidates are required to submit **either** a Dissertation **or** Published Papers. The requirements for these two options are as follows:

Dissertation

12. A dissertation of approximately **5,000 words** (excluding references or appendices) based on original material and data and incorporating personal observations, on a subject to be approved beforehand by the Board.
13. Application on Form E1B must be made for approval of the proposed subject of the dissertation by **1 November** prior to entry to the examination. No exemption is permitted.
14. Candidates are asked, when proposing a subject, to submit an outline showing clearly what the dissertation will cover and how much of the work will be undertaken by the candidate personally.
15. Candidates may not include work, which has already been included in a submission for **any other RCVS postgraduate qualification unless** that work forms only a minor part of

the submission, the major part of which must be distinct from **any** previous submission for **any other postgraduate qualification**.

16. Candidates should declare on Form E1B which part, if any, has previously been used for another postgraduate qualification and outline how it is proposed to re-work/develop the work in respect of this Diploma.
17. The Dissertation subject may be in any aspect of Laboratory Animal Science. The following are examples of Dissertation subjects previously accepted by the subject board:
 - a. "Laboratory animal ophthalmology in relationship to drug safety evaluation."
 - b. "Carriage of S.dublin in Experimental Infections in Mice"
 - c. "Pasteurella multocida in the laboratory rabbit"
 - d. "An ethologically Friendly Rodent Caging System"
 - e. "The non-tumour pathology findings of aging Sprague Dawley rats"
 - f. "The detection and control of enteric shigella infection in macaque colonies."
 - g. "Histopathological findings in a 104 week compatibility study of an electronic identification implant in the B C F mouse"
 - h. "The use of animals in the safety testing of chemicals and medicine"
 - i. "Studies of some biological properties of recombinant human epidermal growth fact (B-urogastrone)"
 - j. "Microbiological Monitoring of Rats and Mice on Long Term Toxicity Tests."
 - k. "Reticulocyte Production in Laboratory Animals Opportunities for Refinement."
 - l. "A Study of the Pathogenesis of Salmonella Dublin Infection in Mice".
 - m. "Evaluation of the efficacy of an existing vaccination regime within a Beagle Colony".
 - n. "Management and Breeding of Marmosets".
 - o. "Various methods to control breeding in a Marmoset Unit".

18. The pages should be numbered, and each sub-section should also be numbered using the decimal format (eg. 1.1, 1.2, 2.1, 2.2 and so on). Sections should include, at least -

Introduction
Description of work carried out
Results
Discussion
Conclusion
References

19. Any supporting papers should be contained in appendices. Illustrations and tables should be included as appropriate. The dissertation should be of a high standard with good literary and scientific presentation.

Word Count

20. The Dissertation should not exceed **5,000 words** excluding references and appendices. A word count must be shown on the front cover of the Dissertation. **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 Diploma in Laboratory Animal Science' marked clearly on the front.

Five Published Papers

21. Application on Form E1B must be made for approval of the proposed subject of the Published Papers by **1 November**. No exemption is permitted.
22. **FIVE** papers are required, that have been published in refereed journals and that have not previously been submitted for another postgraduate qualification. These should consist of a minimum of **TWO Principal Author** papers and **THREE** other papers in which the candidate has had a substantial input. An outline of the proposed submissions should be made **by 1 November** prior to the examination.
23. The five papers should have a common or linked theme and be presented bound, with both introductory commentary showing the relationships between the published papers submitted and with publications in related areas **and** concluding chapters. The candidate may elect to include additional data related to but not included in the five papers.
24. Only papers published, or accepted for publication at the time of submission, in a refereed journal may be used. If a paper is submitted for examination that has not already been published, then it **MUST** be accompanied by a letter from the Editor of the refereed journal confirming final acceptance of the paper for publication. A paper that is accepted for publication subject to minor changes being made is **NOT ACCEPTABLE** for the examinations.
25. A review article is acceptable as **ONE** of the published papers providing **at least ONE** of the other published papers is original work. Short communications, such as brief case reports, are **not** acceptable. Reviews of a series of cases are acceptable.
26. If any multi-author papers are to be included, these must be accompanied by a statement from the co-authors that the senior author (the candidate) was responsible for the majority of the work.
27. The following statement should be included at the front of each copy of the published papers.

Published papers submitted in part fulfilment of the requirements for the RCVS Diploma in.....by (name of candidate).

Acknowledgements are due to: name.....for (description of assistance given).

Grading Scheme

28. The submitted work will be graded "Good Pass"; "Pass" or "Fail":

- **Good Pass** - the work will be lodged in the RCVS Library as a suitable example for future candidates.
- **Pass** – The work is adequate to enable the candidate to proceed to the remaining sections of the examination, but the submitted work may need to be revised by the date of the clinical, oral and practical for lodging in the Library if the candidate is successful in the examination as a whole.
- **Fail** – the work is not adequate to enable a candidate to proceed to the remaining sections of the examination for the year in question.

WRITTEN EXAMINATION

29. 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. In addition, the Examiners will take into consideration spelling and whether or not the question has been answered in the form requested.

30. Candidates are advised to ensure that they have studied the requirements of the syllabus adequately especially with regards to areas that may not be covered in their daily work. Candidates are advised that questions on which they have no knowledge should not be attempted.

Format

WRITTEN EXAMINATION - SECTION (B) OF THE EXAMINATION

31. This Section consists of two 3-hour written papers.

32. In order to provide time for thought-provoking questions to be answered and to reflect the syllabus, the Board's requirements for the written papers are as follows:

Paper 1 – A 3-hour Paper on **General Laboratory Animal Science** consisting of two Sections:

Section A – choice of 2 out of 4 questions (45 minutes each)

Section B – 6 compulsory questions on a wide range of topics (15 minutes each).

Paper II – A 3-hour Paper on the **Special Subject** consisting of two Sections:

Section A –choice of 2 out of 4 questions (45 minutes each)

Section B – 6 compulsory questions on a wide range of topics of the special subject (15 minutes each).

33. Candidates must propose, for the consideration of the Board, a subject for in-depth study in accordance with section VII of the Diploma syllabus. A preliminary choice of subject may be made at the time of enrolment, and a final choice must be made **before 1 November** prior to the examination. An outline of the parameters of the selected subject must also be submitted. Candidates will be examined on the general core subjects at a higher level than for the Certificate.

Marks Scheme

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

CLINICAL, ORAL AND PRACTICAL EXAMINATION

Format

35. The oral/clinical/practical will include:
- Practical handling, ageing and sexing of animals, plus questions relating to housing, husbandry and facility design.
 - "Steeplechase" format, approximately 10-15 short questions based on photographs and pieces of equipment.
 - Oral of approximately 20 minutes.
36. The practical session will last up to two hours, and the oral up to 30 minutes for each candidate, and will cover the syllabus generally and the chosen special subject in a ratio of approximately 2:1. Candidates may be examined in practical handling and sexing of laboratory animals and should be able to demonstrate their proficiency in this respect. It is important that all candidates should possess a good general basic knowledge of the whole field of laboratory animal science - not limited to their own working knowledge. Questions may be asked in relation to the dissertation or papers submitted by the candidate.
37. Part of this section of the examination may also take the format of an Objective Structured Clinical Evaluation (OSCE) that may replace the Steeplechase format. An OSCE is a practical examination in which the candidate is given varying tasks to do (e.g. History taking for a diagnosis of a disease having been called in as the NVS). The process is independently monitored by a second examiner with a list of relevant criteria and scores, so that the candidate is marked against a model answer. The candidate can ask for further information if it is relevant and for clarification. Candidates may also be shown slides and

asked to comment on them. Slides may depict some problems relating to the NVS's duties at a designated establishment.

Marks Scheme

38. TOTAL Mark for this Section (c) = 100 marks

SYLLABUS AND READING LIST

39. A syllabus, with a brief commentary, and reading lists for the Certificate are provided for reference. There are no separate reading lists for the Diploma as candidates at this level are expected to be familiar with all the literature in the area of their elective and most particularly so in the topic of their dissertation or submitted papers.

40. If a candidate demonstrates a lack of fundamental knowledge in broad general aspects (while being well-versed in a narrow area) he or she would be in danger of failing the examination. In order to maintain the credibility of Diplomates, the Board considers that candidates must have a good general knowledge of the whole field of Laboratory Animal Science.

ADVISERS

41. The Board has a list of suggested advisers which is available on request to the RCVS Board Secretary. Applicants are asked to contact an adviser in advance of the application. A candidate may also state if they need informal advice on their studies and preparations for the examination, from someone outside their own "centre". The Board will then put the applicant in touch with an appropriate senior colleague.

ATTENDANCE AT SHORT COURSES

42. The Board has not made any recommendations concerning compulsory attendance at any course or courses.

MEMBERSHIP OF VETERINARY ASSOCIATIONS/SOCIETIES

43. 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

44. Successful candidates are permitted to use the abbreviation **DLAS** after their names, in the RCVS Register of Members, and on practice plate, stationery, etc. Certificate holders who obtain the Diploma in the same subjects cease to use the Certificate abbreviation.

Originated Nov1995, Updated Dec 1996, Further revised after Council March 1997, Revised Nov 1997, Nov 1998, Nov 1999, Nov 2001, Feb 2003. Nov 2004, April 2006 & April 2008

SYLLABUS FOR THE DIPLOMA EXAMINATION IN

LABORATORY ANIMAL SCIENCE

1. INTRODUCTION

- 1.1 The Syllabus and reading list for the Diploma of Laboratory Animal Science is intended to guide candidates to a course of study which will extend the knowledge gained as laboratory animal veterinarians with the Certificate in Laboratory Animal Science (or equivalent) into a depth and breadth of knowledge expected of a specialist consultant.
- 1.2 Thus the knowledge, skills and attitudes required to pass the Diploma examination are those, which would command respect and be regarded as authoritative among other laboratory animal veterinarians. It is the College's aim that holders of the Diploma will give leadership in the field of Laboratory Animal Science.
- 1.3 It is recognised that laboratory animal science is a diverse subject, involving many species and sub-disciplines, and that no single person has a deep knowledge of all its aspects. Accordingly, a candidate must choose a subject which will be examined in depth as part of the Diploma Examination and, additionally, the byelaws require the submission of a dissertation on a subject to be chosen by the candidate and approved by the Board.
- 1.4 Candidates for the Diploma Examination will, however, be expected to demonstrate that they have sufficient breadth and depth of knowledge to meet the demands of their professional role in this speciality fully and well, as indicated by the full Syllabus.
- 1.5 The byelaws provide that the applicant must have had at least 5 calendar years' experience in laboratory animal science, of which at least 3 years must have been spent in an approved centre where the appropriate experience has been obtained on a full-time basis. The purpose of the Diploma Examination is to give the candidates the opportunity to demonstrate that they have gained the necessary knowledge, professional competence and practical skills to specialist level.

2. SUBJECTS IN THE SYLLABUS

- 2.1 The subjects included in the Syllabus for the Certificate in Laboratory Animal Science, including practical handling, sexing and estimating the age of laboratory species.
- 2.2 Experimental method.
- 2.3 Management of laboratory animal facilities.
- 2.4 In addition candidates must choose a subject within one of the following broad fields in which they wish to be examined in depth in relation to laboratory animals, for approval by the Board:

Medicine, surgery and anaesthesia.
Reproduction, genetics and breeding.
Animal husbandry.

Pathology (microbiology, immunology, parasitology, haematology, chemical pathology, histopathology).

Welfare and Ethics: Role of Veterinary Profession in reduction, replacement or refinement of scientific procedures with protected animals.

Any other subject which the candidate may wish to offer.

3. COMMENTARY ON THE SYLLABUS

3.1 Subjects Included in the Syllabus for the Certificate in Laboratory Animal Science

While the same subject material will be examined in the Diploma examination as for the Certificate, candidates will be expected to show greater depth of understanding and breadth of knowledge. Of particular importance will be the ability to marshal facts in support of informed opinions and the ability to give a critical assessment of 'received wisdom'. The uncritical memorisation of facts will not impress the examiners for the Diploma.

As with the Certificate examination, candidates will be expected to demonstrate the practical skills of animal handling and routine ageing and sexing of animals.

3.2 Experimental Method

Familiarity with scientific method and with research techniques will be necessary, particularly in regard to experimental design and interpretation, statistical analysis of data and report writing. A knowledge of the value and limitations of important experimental models is necessary. Candidates must understand selection of the appropriate model and method including spontaneously occurring diseases in animal models.

The principles of Reduction, Refinement and Replacement must be known and candidates will be expected to have some knowledge of *in vitro* alternatives.

Basic knowledge of the major disciplines using laboratory animals, especially toxicology, experimental oncology, basic medical research will be required as well as knowledge of Good Laboratory Practice.

3.3 Management of Laboratory Animal Facilities

Specific aspects of management to be covered include: Health and Safety, Facility Design, Selection and Training of Staff, Personnel Management, Security, Public Relations.

3.4 Subject to be Examined in Depth

This part of the examination allows candidates to demonstrate the knowledge gained in their own field of work or special interest. The Examination board will usually require an external expert examiner to examine the chosen specialist subject and the level of knowledge required will only be gained by extensive reading and experience in the subject.

4. SUMMARY

Great personal commitment in preparing for the examination is necessary to gain the Diploma in Laboratory Animal Science. It requires extensive reading, practical experience and a willingness and ability to think about the subject in order to achieve a successful result. It is however an examination which should be within the grasp of anyone who practices laboratory animal medicine full time at a senior level.

Originated 1984
Revised May 1991
Revised November 1995

SPECIALISATION AND FURTHER EDUCATION

DIPLOMA IN LABORATORY ANIMAL SCIENCE

Candidates should note that the reading list for the SUBJECT 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.

Diploma candidates are expected to be familiar with the texts listed below in the suggested reading list for the Certificate in Laboratory Animal Science. Additionally Diploma candidates are expected by, for example, reading current journals to have a full and accurate awareness of advances in laboratory animal science and of all issues relating to the care and use of laboratory animals. In particular Diploma candidates are expected to create their own study programmes for their specialist subject through searches of relevant literature.

A. Guidelines, Policy Statements, etc

Animal Procedures Committee Reports

ACDP Working safely with research animals: Management of infection risks, HSE Books 1997. ISBN 0 7176 1377 1

Health and Safety Commissions Education and Advisory Committee. Health and Safety in Animal Facilities. HSE Books 1992. ISBN 0 11 886353 3

Health and Safety Commissions Education and Advisory Committee: What you should know about allergy to laboratory animals. HSE Books 1990. ISBN 0 11885527 1

Home Office (2000). **Guidance on the Operation of the Animals (Scientific Procedures) Act, 1986.** ISBN 0 10 556 706-X.

Home Office (1989). **Code of Practice for the Housing and Care of Animals Used in Scientific Procedures.** HMSO. ISBN 010-210-7890.

Home Office (1995). **Code of Practice for the Housing and Care of Animals in Designated Breeding & Supplying Establishments.** HMSO. ISBN 0-10-212595-3.

Home Office (1997) **Code of Practice. The Humane Killing of Animals under Schedule 1 to the Animals (Scientific Procedures) Act 1986.** HMSO ISBN 0-10-265397-6

Education and Training of Personnel Under the Animals (Scientific Procedures) Act, 1986. Statement of Home Office Policy, February 1993. (Also published in Report of the Animal Procedures Committee for 1992. HMSO. CM 2301).

Guidelines for the Care of Laboratory Animals in Transit (1992). Laboratory Animal Breeders Association of Great Britain Ltd (LABA) and Laboratory Animal Science Association (LASA).

ROYAL COLLEGE OF VETERINARY SURGEONS AND BRITISH VETERINARY ASSOCIATION (1999). **Guidelines for Veterinary Surgeons Employed in Scientific Procedure Establishments and Breeding & Supplying Establishments.**

JONES B (1994). **The Supply of Non-Human Primates for Use in Research & Testing.** Welfare Implications and Opportunities for Change, RSPCA, Horsham.

Welfare of Animals (Transport) Order 1997. HMSO. ISBN 01 105 234 66.

COUNCIL OF EUROPE(1986) Convention for the protection of vertebrate animals used for experimental and other scientific purposes.

EUROPEAN COMMUNITIES COUNCIL (1986) The Council Directive on the approximation of laws regulations and administrative provisions of the Member States regarding the protection of animals used for experimental and other scientific purposes(Directive 86/609/EEC).

BAYNE K A L AND KREGER M D (EDS) (1995) Wildlife Mammals as Research Models: In the laboratory and field. Scientists Center for Animal Welfare, 7833 Walker Drive, Suite 340, Greenbelt. MD 20770. USA.

Health and Safety Commissions Advisory Committee on Dangerous Pathogens Categorisation of Biological Agents according to Hazard and categories of containment(4th edition). HSE Books 1995. ISBN 0 7176 1038 1.

ACDP: Working safely with simians: Management of Infection Risks. *Specialist supplement to: working safely with research animals: management of infections risks (1998) HSE.*

Guide for the care and use of laboratory animals. 7th rev. ed. (1996) Institute of Laboratory Animal Resources, Commission on Life Sciences, National Research Council. National Academy Press, Washington DC. ISBN 0 309 05366 3.

CCAC Guide to the Care and Use of Experimental Animals (1993) Volume 1, 2nd Edition. Eds. Olfert E D, Cross B M and McWilliam A A. Canadian Council on Animal care. ISBN 0 919087 18 3.

B. Textbooks

AMERICAN COLLEGE OF LABORATORY ANIMAL MEDICINE SERIES.

INCLUDING:

1. MANNING P J, RINGLER D H AND NEWCOMER C E (1994): The Biology of the Laboratory Rabbit, 2nd Edition. Academic Press.

2. KOHN D, WIXSON S AND WHITE W (1997) Anaesthesia and Analgesia in Laboratory Animals. Academic Press. ISBN 0 12 417508.

PINKERT C A(1994) Transgenic Animal Technology - A Laboratory Handbook. Academic Press. ISBN 0 12 557165 8 .

FLECKNELL P (1996). **Laboratory Animal Anaesthesia**. 2nd Edition. Academic Press.

HARKNESS J E AND WAGNER J E (1995). **The Biology and Medicine of Rabbits and Rodents**. Philadelphia: Lea and Febiger. ISBN 0-683-039199.

LABER-LAIRD K, SWINDLE M, FLECKNELL P A (1996). **Handbook of Rodent and Rabbit Medicine**. Elsevier Science Ltd.

OKERMAN L (1994). **Diseases of Domestic Rabbits**. Blackwell Scientific Publications. ISBN 0-632-02254-X.

PERCY D H AND BARTHOLD S W (1993) **Pathology of Laboratory Rodents and Rabbits**. Iowa State University Press. ISBN 0 12 417508.

TUFFERY A A (Ed) (1995). **Laboratory Animals. An Introduction for Animal Experimenters**. 2nd Edition. J Wiley & Sons. ISBN 0-471-95257-5.

UFAW (1987). **Handbook on the Care and Management of Laboratory Animals**. 6th Edition Longman Scientific & Technical. ISBN 0-582-40911X.

WAYNFORTH H B AND FLECKNELL P A (1992). **Experimental and Surgical Technique in the Rat**. 2nd Edition. Academic Press. ISBN 0-12-738851-6.

WOLFENSOHN AND LLOYD (1994). 1998 **Handbook of Laboratory Animal Management and Welfare**. Oxford University Press. ISBN 0-19-854832-x.

VAN ZUTPHEN L F M, BAUMANS V AND BEYNEN A C (1993) **Principles of Laboratory Animal Science**. Elsevier Science Publishers. ISBN 0 444 81487 6.

SMITH J (1991). **Lives in the Balance**. Oxford University Press. ISBN 0-19-854744-7.

COMMITTEE ON INFECTIOUS DISEASES OF MICE AND RATS, INSTITUTE OF LABORATORY ANIMAL RESOURCES, COMMISSION ON LIFE SCIENCES, NATIONAL RESEARCH COUNCIL. (1991) **Infectious diseases of Mice and Rats**. National Academy Press, Washington DC. ISBN 0 309 03794 8.

SVENDSEN P AND HAU J (1994) **Handbook of Laboratory Animal Science**, CRC Press. Volume 1: Selection and Handling of Animals in Biomedical Research. ISBN 08493 4378 X
Volume 2: Animal Models. ISBN 0 8493 4390 9.

SMITH C P AND TAYLOR V (Eds) **Environmental enrichment Information resources for laboratory animals: 1965 - 1995**. Birds, Cats, Dogs, Farm animals, Ferrets, Rabbits and Rodents. UFAW. ISBN 0 900 767 91 X.

ORLANS F B (1993) **In The Name Of Science: Issues in Responsible Animal Experimentation**. Oxford University Press. ISBN 0 19 507043 7.

FESTING M F W (1979) **Inbred Strains In Biomedical Research**. Macmillan Press. ISBN 0 333 23809 5.

PUHLER A (ED) (1993) **Genetic Engineering of Animals**. VCH Germany. ISBN 3 527 300414.

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,pp231-266.

BVA/FRAME/RSPCA/UFAW JOINT WORKING GROUP ON REFINEMENT (1993 & 1994) Removal of Blood from Laboratory Mammals and Birds. *Laboratory Animals* 27, 1 - 22 and 28, 178 - 179.

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

MONAMY V (1996) *Animal Experimentation: A Student Guide to Balancing the Issues*. ANZCCART.

MORRIS T H (1995) Antibiotic Therapeutics in Laboratory Animals. *Laboratory Animals* 29, 16-36.

RUSSELL W M S AND BURCH R L (1992) *The Principles of Humane Experimental Technique*. Special Edition UFAW. ISBN 0 900767 78 2.

FOX J G AND LEE A (1997) The role of Helicobacter species in newly recognised gastrointestinal tract disease of animals. *Laboratory Animal Science*, 47,3,222-255.

MANSEY C E (1992) *The assessment of Stress in Laboratory Animals*, RSPCA, Causeway, Horsham, West Sussex. RH12 1HG.

MAFF (1995) Report of the Committee to consider the Ethical Implications of Emerging Technologies in the Breeding of Farm Animals. London HMSO. ISBN 0 11 242965 3.

NOMURA T (1997) Practical development of genetically engineered animals as human disease models. *Laboratory Animal Science* 47,2,113-117.

ADVISORY GROUP ON THE ETHICS OF XENOTRANSPLANTATION (1997) *Animal tissue into Humans*. HMSO. ISBN 0 11 3218664.

RODENT REFINEMENT WORKING PARTY (1998) Refining rodent husbandry: the mouse. *Laboratory Animals* 32, 233-259.

Recommendations for euthanasia of experimental Animals (1996 & 1997) Prepared by a Working Party for DGXI of the European Commission. *Laboratory Animals*, 30, 293 - 31, 1-32.

JONES B (1996) Current standards in Europe for the care of non-human primates in laboratories. RSPCA. ISBN 0 901098 05 1.

ASSOCIATION OF VETERINARY TEACHERS AND RESEARCH WORKERS (1986). **Guidelines for the Recognition and Assessment of Pain in Animals**. *Veterinary Record*, 118, 334-338.

MORTON D B and GRIFFITHS P H M (1985). **Guidelines on the Recognition of Pain, Distress and Discomfort in Experimental Animals and an Hypothesis for assessment**. *Veterinary Record*, 116, 431-436.

D. Journals for Regular Reading

Animal Technology & BLAVA Briefing from CertLAS

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.

Candidates should ensure they are familiar with all guidelines and Codes of Practice applicable at the time of their examination.

Laboratory Animal Science. A publication of the American Association for Laboratory Animal Science(AALAS) serve as a forum for the exchange of information on comparative and experimental medicine.

Contemporary Topics in Laboratory Animal Science. Bi-monthly official communication journal of the American Association for Laboratory Animal Science (AALAS). Includes a section of referred articles on clinical, technical, management and philosophical topics.

ILAR Journal. Published by National research council; Institute for Laboratory Animal Research, National Academy of Sciences, Post Office Box 97161, Washington DC, 20090, USA.

ATLA. Alternatives to Laboratory Animals. ATLA is intended to cover all aspects of the development, validation, introduction and use of alternatives to laboratory animals in biomedical research and toxicity testing.

Animal Welfare. Brings together the results of scientific research and technical studies related to the welfare of animals kept on farms, in laboratories, as companions, in zoos or managed in the wild.

ANZCCART News. Journal of the Australian and New Zealand Council for the care of animals in research and Teaching. It is a publication for researchers and teachers; members of animal ethics committees; staff of organisations concerned with research, teaching and funding; and parliamentarians and members of the public with interests in the conduct of animal-based research and teaching and welfare of animals so used. Available F.O.C. from ANZCCART, PO Box 19, Glen Osmond, SA 5064.

Boyd Group Papers

"Ethical Review of Research Involving Animals" March 1995

Originated circa 1983
Revised February 1991
Revised November 1995
Revised December 1996
Revised November 1997
Revised November 1998
Revised November 2000

E.1A

PLEASE ENSURE THAT YOU COMPLETE A FORM E1 (TO BE FOUND IN THE COMMON DOCUMENTS) AND ATTACH IT TO THIS FORM

Details of the veterinary centre in which experience is being gained on a full-time basis over AT LEAST THREE CALENDAR YEARS to meet the requirements of the byelaws for the **Diploma in Laboratory Animal Science**:

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

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 case load 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 veterinary centre and address

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

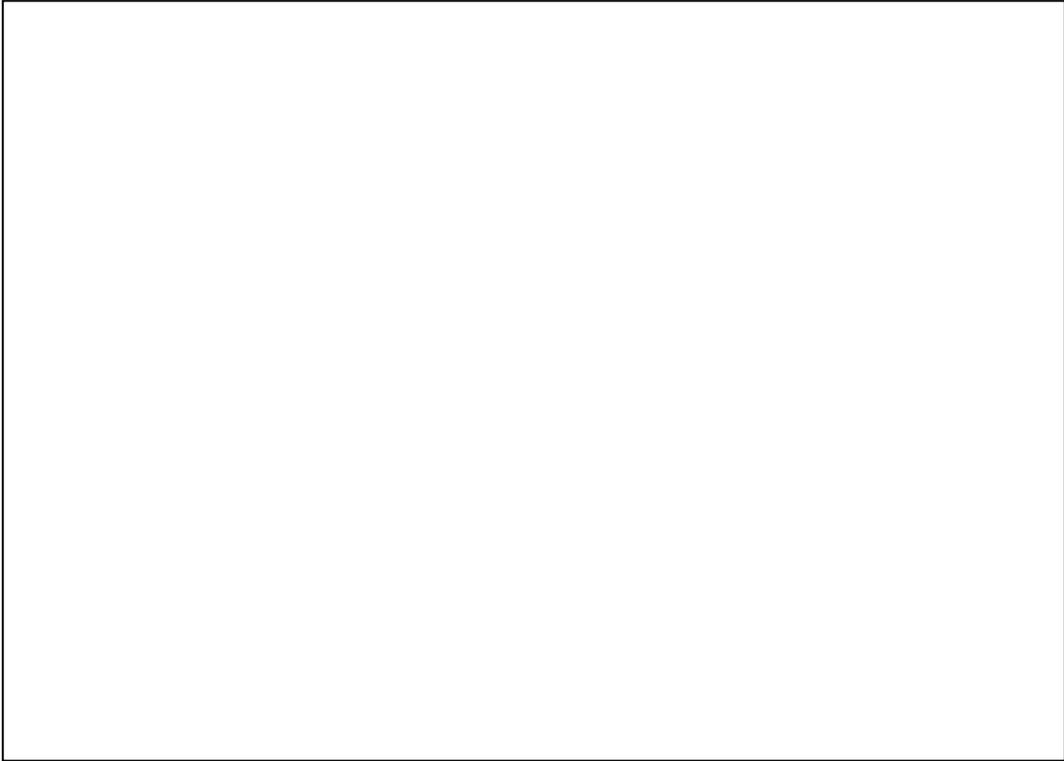
7. Please list any previous (or subsequent) employment relevant to laboratory animal science and give brief details:

8. Please list below any other involvement in laboratory animal science, including membership of relevant associations, attendance at short courses, meetings, symposia, etc., and publications.

Signature

Date

3. In depth subject: -



Signature

Date

Please enclose a SAE for acknowledgement

Specialisation and Further Education

DIPLOMA IN LABORATORY ANIMAL SCIENCE

Published Papers

(For use where a candidate has not previously applied for approval)

Application to be completed and returned to the RCVS, Belgravia House, 62-64 Horseferry Road, London SW1P 2AF **no later than 1 November in the year prior to that in which it is planned to enter for the examination.**

1. **NAME** in full (block letters)

2. **TITLES, DATES AND DETAILS OF PUBLICATIONS** - giving a brief summary of content of each.

3. **In depth subject: -**

Signature

Date

Please enclose a SAE for acknowledgement

DIPLOMA 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 countersigned by your Adviser before being returned to the RCVS, Belgravia House, 62-64 Horseferry Road, London SW1P 2AF **by 1 November** prior to the examination. **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 for contact during day _____

EMAIL _____

6. DATE OF ENROLMENT _____
MONTH/YEAR)

7. PERIODS OF EXPERIENCE BEING OFFERED to meet the requirements of the byelaws

Veterinary practice or centre
(name and address)

Period of employment
(from/to)

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The period of experience offered must be at least five calendar years of which at least three years must have been spent in a centre approved by the Board. The period of experience offered for the Certificate may be counted towards the time required for the Diploma if the Board is satisfied that it meets the requirements therefore.

Please complete Form E1.A attached.

8. PUBLICATIONS/ARTICLES/PAPERS/LECTURES

Give details below or append a list, and include any involvement in the instruction of others:

9. 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:

10. In-depth Subject:

11. SUBMITTED WORK

DISSERTATION TITLE - please confirm your title below:

Has an outline been submitted on Form **EIB** and approved by the Board? **YES / NO**

You are requested to declare which part, if any, has previously been used for another postgraduate qualification and to outline on Form **EI.B how you propose to re-work/develop the work in respect of this Diploma.**

12. SUBJECT OF REFEREED PAPERS

Please give below your choice of subject *if not submitting a Dissertation*.

13. ATTENDANCE AT RELEVANT SHORT COURSES OVER PAST THREE YEARS

(Not already included on your CPD Record Card).

Title of courses attended:

Dates and venue:

14. ATTENDANCE AT CONGRESSES, SYMPOSIA, ETC.OVER PAST THREE YEARS

(Not already included on your CPD Record Card).

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

Please send a photocopy of your RCVS CPD Record Cards for all CPD events covering the period of experience being offered.

15. I HEREBY APPLY FOR FINAL APPROVAL OF EXPERIENCE AND FOR PERMISSION TO SUBMIT AN ENTRY TO THE NEXT DIPLOMA 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.

16. 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 (closing date for receipt of entries is 1 March).

Signature _____ Date _____

Please enclose a SAE for acknowledgement

THE FOLLOWING SECTION SHOULD BE COMPLETED BY YOUR ADVISER

I confirm that I am acting as this candidate's Adviser

Name _____ Date _____

Signature _____ Date _____

PLEASE RETURN ORIGINAL FORM PLUS FOUR COPIES

DIPLOMA IN LABORATORY ANIMAL SCIENCE

A List of persons whom candidates may approach to act as their Adviser is available from the Board Secretary in the Education Department:

ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA EXAMINATION IN LABORATORY ANIMAL SCIENCE
MONDAY 10 JULY 2006

PAPER I
GENERAL
(3 hours)

This paper is in two Sections (A and B)
instructions relating to the number of questions to be answered
are given at the head of each Section.

SECTION A

Candidates are required to answer TWO of the following FOUR questions.

Allow 45 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. **Discuss, using examples**, the role of experimental design and statistical analysis in implementation of the 'Three Rs' (Reduction, Refinement and Replacement).
 2. **Write an essay** on rodent parvoviruses
 3. Transgenic animals are replacing many of the traditionally used animals in research. Make some suggestions as to why, **outline** how they can be produced, and describe, with special regard to animal welfare, the various problems which may be encountered in their production.
 4. How would you go about measuring animal suffering retrospectively, and why could it be considered to be beneficial?

P.T.O. for SECTION B

ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA EXAMINATION IN LABORATORY ANIMAL SCIENCE

MONDAY 10 JULY 2006

PAPER I
GENERAL
(3 hours)

SECTION B

Candidates are required to answer ALL SIX of the following questions.

Allow 15 minutes per question.

-
5. **Briefly outline** the health and safety issues that may impact upon a laboratory animal professional and possible control measures
 6. How does the Animals (Scientific Procedures) Act 1986 (ASPA) define reuse? Can it ever be justified ethically?
 7. **Briefly outline** advantages and disadvantages of Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), and Microtomography (Micro-CT) imaging in rodents.
 8. Explain how mouse passports can contribute to refinement.
 9. How would you monitor whether a method of enrichment was effective?
 10. Imagine you have an outdoor aviary for experimental birds. What factors would you be taking into consideration at the present time in regard to avian influenza if one of the birds died suddenly.
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ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA EXAMINATION IN LABORATORY ANIMAL SCIENCE

MONDAY 10 JULY 2006

PAPER II

SPECIAL SUBJECT: 'Anaesthesia and Analgesia'
CANDIDATE NO. DLAS/06/1

(3 hours)

This paper is in two Sections (A and B)
instructions relating to the number of questions to be answered
are given at the head of each Section.

SECTION A

Candidates are required to answer TWO of the following FOUR questions.

Allow 45 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. **Discuss** the use of barbiturate anaesthesia in laboratory animals.
2. What factors would you consider when asked to provide an anaesthetic, analgesic and perioperative care regimen for lung transplantation studies in Beagle dogs? Give your preferred regimen for such a procedure.
3. **Describe** the specific controls under the Animals (Scientific Procedures) Act 1986 (ASPAs) for the use of neuromuscular blockers. **Discuss** their use in the rat.
4. **Discuss** the issues and potential solutions to be considered when advising on anaesthesia for research studies into the central nervous system.

P.T.O. FOR SECTION B

ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA EXAMINATION IN LABORATORY ANIMAL SCIENCE

MONDAY 10 JULY 2006

PAPER II

SPECIAL SUBJECT: 'Anaesthesia and Analgesia'
CANDIDATE NO. DLAS/06/1

SECTION B

Candidates are required to answer ALL SIX of the following questions.

Allow 15 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.

5. **Briefly discuss** perioperative heat loss in the mouse and how this may be controlled.
 6. **Briefly outline** advantages, disadvantages and safe working practices associated with urethane anaesthesia in the rat.
 7. **Briefly discuss** opioid hyperalgesia and how it might be addressed.
 8. Write **short notes** on anaesthesia in fish.
 9. Write **short notes** on isoflurane anaesthesia in the rat.
 10. Write **brief notes** on alternatives to using anaesthesia.
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ROYAL COLLEGE OF VETERINARY SURGEONS
DIPLOMA EXAMINATION IN LABORATORY ANIMAL SCIENCE
MONDAY 10 JULY 2006

PAPER II

SPECIAL SUBJECT: 'Welfare and Ethics'
CANDIDATE No. DLAS/06/2
(3 hours)

This paper is in two Sections (A and B)
instructions relating to the number of questions to be answered
are given at the head of each Section.

SECTION A

Candidates are required to answer TWO of the following FOUR questions.

Allow 45 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. **Compare and contrast** the animal rights and animal welfare positions with respect to the testing of cosmetic products.
 2. Critically **discuss** the statement that "*Vets should always be in favour of research as, one way or another, they make their living from it*".
 3. The new Animal Welfare Bill stresses a 'duty of care'. **Discuss** this duty by using the 'four principles' approach.
 4. **Discuss in detail** the cost benefit analysis in animal research with examples.

P.T.O. FOR SECTION B

ROYAL COLLEGE OF VETERINARY SURGEONS

DIPLOMA EXAMINATION IN LABORATORY ANIMAL SCIENCE

MONDAY 10 JULY 2006

PAPER II

SPECIAL SUBJECT: 'Welfare and Ethics'
CANDIDATE No. DLAS/06/2

SECTION B

Candidates are required to answer ALL SIX of the following questions.

Allow 15 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.

5. **Describe briefly** what is meant by pain, suffering, distress and lasting harm in the 1986 Animals (Scientific Procedures) Act, and give an example of **each**.
 6. Under the 1986 Animals (Scientific Procedures) Act fetuses are protected from 50% of the way through gestation. *Why?*
 7. How are animals 'consented' for research in the United Kingdom?
 8. **Describe** how experimental strategy can contribute to refinement and give **TWO** examples.
 9. **Briefly describe** the ethical tensions in the use of Great Apes in animal research.
 10. **Detail** the ethical views that militate against the use of transgenic animals containing human genes in research.
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