



Australian code of practice for the care and use of animals for scientific purposes

6th edition 1997

National Health and Medical Research Council

NHMRC

Australian code of
practice for the care and
use of animals for
scientific purposes

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- Commonwealth Scientific and Industrial Research Organisation
- Agricultural Resource Management Council of Australia and New Zealand
- Australian Research Council
- Australian Vice-Chancellors' Committee

and representatives of the

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Introduction

Purpose of the Code

The purpose of this Code is to ensure the humane care of animals used for scientific purposes, including teaching.

Its aims are to:

- emphasise the responsibilities of investigators, teachers and institutions using animals;
- ensure that the welfare of animals is always considered;
- ensure that the use of animals is justified;
- avoid pain or distress for each animal used in scientific and teaching activities;
- minimise the number of animals used in projects; and
- promote the development and use of techniques which replace animal use in scientific and teaching activities.

The Code establishes Animal Ethics Committees (AECs) to verify that the case for animal use is justified and to ensure adherence to the principles of Replacement, Reduction and Refinement.

Scope of the Code

The Code encompasses all aspects of the care and use of, or interaction with, animals for scientific purposes in medicine, biology, agriculture, veterinary and other animal sciences, industry and teaching. It includes their use in research, teaching, field trials, product testing, diagnosis, the production of biological products and environmental studies.

The Code provides general principles for the care and use of animals, specifies the responsibilities of investigators and institutions, and details the terms of reference, membership and operation of institutional AECs. It also provides guidelines for the humane conduct of scientific and teaching activities, and for the acquisition of animals and their care, including their environmental needs.

The Code covers all live non-human vertebrates. Eggs, fetuses and embryos must be treated in a humane manner where development of an integrated nervous system is evident. Investigators should consider forwarding proposals to use higher order invertebrates to AECs.

Revision of the Code

This 6th edition of the Code of Practice is sponsored by the National Health and Medical Research Council (NHMRC), the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australian Research Council (ARC), and the Australian Vice-Chancellors Committee (AVCC). It was revised by representatives of these organisations together with representatives of the State and Territory governments of Australia, animal welfare groups and with input from the public.

The first Code was produced by the NHMRC in 1969. Revisions of the Code were undertaken in 1979, 1982, 1985 and 1989.

Periodic revisions take into account changes in the biological sciences and in community attitudes.

Comments on the Code

Comments on this Code are invited and should be addressed to The Secretary, NHMRC, GPO Box 9848, Canberra ACT 2601.

State and Territory legislation regulating the use of animals for scientific purposes

Current in 1997

Queensland	<i>Animals Protection Act 1925-1977</i>
New South Wales	<i>Animal Research Act 1985</i>
Victoria	<i>Prevention of Cruelty to Animals Act 1986</i>
Tasmania	<i>Animal Welfare Act 1993</i>
South Australia	<i>Prevention of Cruelty to Animals Act 1985</i>
Western Australia	<i>Prevention of Cruelty to Animals Act 1920-1976</i>
Northern Territory	<i>Prevention of Cruelty to Animals Act 1980</i>
Australian Capital Territory	<i>Animal Welfare Act 1992</i>

Other relevant legislation

Commonwealth

- (i) *Australian Wildlife Protection (Regulation of Exports and Imports) Act 1982*
- (ii) *Export Control Act 1982, including Export Control (Animals) Order 1987*
- (iii) *Quarantine Act 1908*

State-Territory

- (i) Native Fauna Acts
- (ii) Occupational Health and Safety Acts

NOTE: Copies of the above legislation and relevant regulations may be obtained from Federal, State and Territory publishing services.

Definitions of terms used in this Code

Animal: Any live non-human vertebrate, that is, fish, amphibians, reptiles, birds and mammals, and encompassing domestic animals, purpose-bred animals, livestock and wildlife¹.

Animal Ethics Committee (AEC): A committee constituted in accord with the terms of reference and membership laid down in this Code of Practice.

Approved project: A project which has been formally approved by a properly constituted AEC, on the basis of a written proposal.

Death as an end-point: When the death of an animal(s) is the deliberate measure used for evaluating biological or chemical processes, responses or effects.

Distress: An acute or chronic response of an animal caused by stimuli that produce biological stress, which manifests as observable, abnormal physiological or behavioural responses.

Euthanasia: The process of inducing a painless death.

Investigator: A person approved by an AEC to be responsible for the conduct of an approved project involving animals.

Livestock: Animals which are used in commercial agriculture, including cattle, sheep, pigs, poultry, goats and horses.

Project: A series of related studies or teaching activities that form a discrete piece of work.

¹ See definition of wildlife.

Proposal: A written outline of a project put forward for consideration by an AEC.

Scientific purposes: All those activities performed to acquire, develop or demonstrate knowledge or techniques in any scientific discipline, including activities for the purposes of teaching, field trials, environmental studies, research, diagnosis, product testing, and the production of biological products.

Tranquillisers: Drugs which are used to reduce anxiety or produce sedation.

Voucher specimen: Any specimen which serves as a basis of study and is retained as a reference.

Wildlife: Free-living vertebrates of native, non-indigenous and feral species including captive bred animals and those captured from free-living populations.

Section 1: General principles for the care and use of animals for scientific purposes

Purpose: For the guidance of investigators, teachers, institutions, AECs and all involved in the care and use of animals for scientific purposes.

Encapsulated in these principles is the need in scientific and teaching activities to consider:

- the *replacement* of animals with other methods;
- the *reduction* in the number of animals used; and
- the *refinement* of techniques used to reduce the impact on animals.

Justification & Responsibilities

- 1.1 Scientific and teaching activities using animals may be performed only when they are essential to:
 - obtain and establish significant information relevant to the understanding of humans or animals;
 - the maintenance and improvement of human or animal health and welfare;
 - the improvement of animal management or production; or
 - the achievement of educational objectives.
- 1.2 Studies using animals may be performed only after a decision has been made that they are justified, weighing the scientific or educational value of the study against the potential effects on the welfare of the animals.
- 1.3 People who use animals for scientific purposes have an obligation to treat them with respect and consider their welfare as an essential factor when planning and conducting studies.
- 1.4 The acquisition, care and use of animals for all scientific purposes in Australia must be in accord with this Code of Practice, and with Commonwealth, State and Territory legislation.
- 1.5 Investigators and teachers have direct and ultimate responsibility for all matters relating to the welfare of the animals they use.
- 1.6 Institutions using animals for scientific purposes must establish AECs to ensure that all animal use conforms with the standards of this Code.²

² See 2.1.1(i)

- 1.7 Investigators and teachers must submit written proposals for all animal studies to an AEC which must take into account the expected value of the knowledge to be gained, the justification for the study, and all ethical and animal welfare aspects.
- 1.8 Scientific and teaching activities must not commence until written approval has been obtained from the AEC.

Replacement

- 1.9 Techniques which replace or complement the use of animals in scientific and teaching activities must be sought and used wherever possible.

Reduction

- 1.10 Studies must be scientifically and statistically valid, and must use only the minimum number of animals necessary.
- 1.11 The principle of reducing the number of animals used in scientific and teaching activities should not be implemented at the expense of the greater suffering of individual animals.
- 1.12 Scientific and teaching activities involving the use of animals must not be repeated unnecessarily.

Refinement

- 1.13 Animals chosen must be suitable for the purposes of the investigation taking into account their biological characteristics, including behaviour, genetic constitution and nutritional, microbiological and general health status.
- 1.14 Wildlife should be taken from natural habitats only if animals bred in captivity are not available or are unsuitable for the specific scientific purpose.
- 1.15 Investigators must use the best available scientific techniques and be competent in the procedures they perform.
- 1.16 Studies must be designed to avoid pain or distress to animals. If this is not possible, pain or distress must be minimised.
- 1.17 Pain and distress cannot be evaluated easily in animals and therefore investigators and teachers must assume that animals experience pain in a manner similar to humans. Decisions regarding the animal's welfare must be based on this assumption unless there is evidence to the contrary.
- 1.18 An animal which develops signs of pain or distress of a kind and degree not predicted in the proposal, must have the pain or distress alleviated promptly. If severe pain cannot be alleviated promptly, the animal must be killed humanely forthwith. Alleviation of such pain or distress must take precedence over finishing a study.
- 1.19 Scientific and teaching activities which may cause pain or distress of a kind and degree for which anaesthesia would normally be used in medical or veterinary practice must be carried out using anaesthesia appropriate to the species and the procedure.

- 1.20 Pain management appropriate to the species, the procedure and the circumstances must be provided.
- 1.21 Analgesic and tranquilliser usage should at least parallel usage in medical or veterinary practice.
- 1.22 When it is not possible to use anaesthetics or analgesics, such as in certain toxicological or animal production studies or in animal models of disease, the end-point of the experiment must be as early as possible to avoid or minimise pain or distress to the animals.
- 1.23 Neuromuscular blocking agents must not be used without appropriate general anaesthesia, except in animals where sensory awareness has been eliminated. If such agents are used, continuous or frequent intermittent monitoring of paralysed animals is essential to ensure that the depth of anaesthesia is adequate to prevent pain or distress.
- 1.24 Investigators must avoid using death as an experimental end-point whenever possible.
- 1.25 Scientific and teaching activities involving the use of animals must be as brief as possible.
- 1.26 Animals must be transported, housed, fed, watered, handled and used under conditions which are appropriate to the care of the species. The welfare of the animals must be a primary consideration in the provision of care which should be based on the behavioural and biological needs of the species.

Section 2: Responsibilities of institutions and their animal ethics committees

2.1 Responsibilities of institutions

2.1.1 Institutions which use animals for scientific purposes, including teaching, must:

- (i) establish one or more AECs directly responsible to the governing body of the institution or its delegate. Where animal usage is small, the institution may access an external AEC;
- (ii) ensure, through the AEC, that all scientific and teaching activities involving the use of animals comply with relevant legislation;
- (iii) provide each AEC with facilities, powers and resources³ to fulfil its terms of reference and operate as set out in Section 2.2;
- (iv) refer to the appropriate AECs for comment on all matters which may affect animal welfare in the institution including the building of, or modification of, animal facilities;
- (v) review annually the operation of each AEC⁴;
- (vi) respond effectively to recommendations from each AEC to ensure that the facilities for the housing, care, use and disposal of animals are appropriate to the maintenance of the health and well-being of the animals⁵;
- (vii) respond promptly and effectively to recommendations from each AEC to ensure that all use of animals for scientific purposes within the institution remains in accord with this Code;
- (viii) upon the advice of the AEC, discipline staff who contravene the Code;
- (ix) provide all relevant staff with details of the institution's policy on the care and use of animals, confidentiality, Freedom of Information legislation, legal requirements and commercial considerations;

3 Provision of resources should include areas such as orientation of new AEC members, purchase of educational material, access to training courses for AEC members and access to administrative assistance.

4 This review should include assessment of the annual report from the AEC and a meeting with the AEC chair.

5 The AEC should report through the Chair to the Chief Executive Officer of the institution (or delegated representative of the CEO) and when fulfilling its responsibilities should receive the full support of the CEO.

- (x) provide staff members with information on potential disease hazards from their work with animals;
- (xi) establish mechanisms to respond to enquiries or complaints concerning the use of animals within the institution and ensure that staff may voice concerns without jeopardising their employment;
- (xii) establish grievance procedures for AEC members and investigators who are dissatisfied with AEC procedures or decisions;
- (xiii) ensure that the AEC develops guidelines for animal care and use within the institution and that these are implemented, including those which ensure that emergencies are detected promptly and dealt with effectively;
- (xiv) ensure that there are adequate numbers of staff to care for the animals and that they are appropriately trained and instructed; and
- (xv) ensure that appropriate veterinary services are available and that there is access to diagnostic services.

2.2 Responsibilities and operation of AECs

AECs must ensure that all animal care and use within the institution is conducted in compliance with this Code and incorporates the principles of Replacement, Reduction and Refinement.

Terms of Reference

2.2.1 AECs must have terms of reference which include provisions to:

- (i) monitor the acquisition, transport, production, housing, care, use and disposal of animals;
- (ii) recommend to the institution any measures needed to ensure that the standards of this Code are maintained;
- (iii) examine and approve, subject to modification, or reject written proposals relevant to the use of animals in scientific and teaching activities. Also to approve only those studies for which animals are essential and which conform to the requirements of this Code, taking into consideration ethical and welfare aspects as well as scientific or educational value;
- (iv) formally withdraw approval for any project or authorise the treatment or humane killing of any animal;
- (v) examine and comment on all institutional plans and policies which may affect animal welfare;
- (vi) maintain a register of approved projects; and
- (vii) perform all other duties required by this Code.

Membership

2.2.2 An AEC must have a membership which will allow it to fulfil its terms of reference. It must comprise at least four persons, including a separate person appointed to each of the following categories:

Category A. A person with qualifications in veterinary science, with experience relevant to the activities of the institution or, in special circumstances, a person with qualifications and experience to provide comparable expertise⁶;

Category B. A person with substantial recent experience in the use of animals in scientific or teaching activities⁷;

Category C. A person with demonstrable commitment to, and established experience in, furthering the welfare of animals, who is not employed by or otherwise associated with the institution, and who is not involved in the care and use of animals for scientific purposes. The person should where possible be selected on the

6 The intention is that every AEC has a veterinarian as the Category A member recognising that this may not always be possible for AECs in remote or very specialised research institutions, e.g. a wildlife research station in remote Australia. In this case, a well-trained wildlife officer may be an appropriate Category A member. Similarly, a person with qualifications in wildlife biology and experience with the species being studied may be the best Category A member in some very specialised research institutions.

However, unless such special circumstances exist, the AEC Category A position should be filled by a registrable veterinarian who should have training and experience in the husbandry of the species used by the institution.

Where veterinarians do not have this experience, they must familiarise themselves with the biology and clinical characteristics of the species of animals used.

7 This member should have appropriate research or teaching experience. This will usually entail the possession of a higher degree(s).

8 It is preferable that the Category C person be a nominee, but not a representative, of an animal welfare organisation as this will ensure both that the animal welfare credentials of the person are genuine and that the person will receive some measure of support from their nominating organisation. It is for these reasons that the Code suggests that the Category C person be chosen on the basis of active membership of an animal welfare organisation and has a "track record" in paid or voluntary work for the welfare of animals. Most animal welfare groups, e.g. RSPCA, ANZFAS, Animal Welfare League and the Animal Societies Federation, maintain lists of responsible members willing to devote time to AECs.

The purpose of including an animal welfare person on each AEC is twofold:

- (i) This member should bring an animal welfare perspective to AEC deliberations. While all members of AECs must consider the welfare of the animals, the Category C member brings to the committee a special awareness of current community animal welfare concerns, and these will be his/her primary focus during AEC deliberations.
- (ii) Inclusion of hundreds of animal welfarists Australia-wide should ensure that the animal welfare movement becomes knowledgeable of the work being performed in research and teaching institutions, and that scientists and teachers become more aware of genuine concerns over animal welfare.

Veterinarians are only appropriate as Category C members when they have specific welfare experience, for example, veterinarians working in animal shelters and pounds.

basis of active membership of, and nomination by, an animal welfare organisation⁸; and

Category D. An independent person who does not currently and has not previously conducted scientific or teaching activities using animals, and who is not an employee of the institution, except under defined circumstances.⁹

- 2.2.3 A person responsible for the daily care of animals within the institution should have membership of the AEC.¹⁰
- 2.2.4 The AEC may include additional members to ensure that it can function effectively.¹¹
- 2.2.5 The Chairperson should hold a senior position in the institution.¹²
- 2.2.6 If the committee has more than four members, Categories C plus D should represent no less than one third of the members.
- 2.2.7 The composition of the AEC also must comply with any relevant legislation.
- 2.2.8 Before appointment, all members of the AEC should acknowledge in writing their acceptance of the terms of reference of the committee and any requirements for confidentiality required by the institution. The committee should reach agreement on how advice may be sought without breaching confidentiality.

9 The Category D person should not fit any of the other categories - ie, they should not be a veterinarian, should not have present or past research or teaching experience using animals and should not qualify as an animal welfare member. They should be members of the wider community who can contribute different and independent perspectives to the deliberations of the committee.

It is envisaged that the Category D person will have no other association with the institution apart from his/her membership of the AEC. The wording says "except under defined circumstances" to cater for the special situation that exists at universities where tenured academic staff from non-scientific departments can be seen as being truly independent of the departments where medical or scientific research is undertaken. If such an employee is appointed, the individual must be in a senior position and must not be supervised by other members of the committee or by anyone involved in animal research at the institution. The institution must provide clear reasons for the necessity to appoint an employee in this category. Other than this specific situation, appointments to Category D should not be made internally. Therefore, secretaries or administrative staff are not suitable. Persons too closely identified professionally with the institutions are also not suitable. The Category D person must be viewed by the wider Australian community as bringing a completely independent view to the committee and may include people such as distinguished public figures, business people, teachers, retirees, accountants, lawyers, etc.

10 It is essential to have at the AEC meeting someone who can provide the AEC with specific information on animals in the institution. It is not possible to make this a mandatory Category since in some circumstances the need for animal care may be minimal.

11 Institutions may appoint people with skills and background of value to the AEC additional to the four required categories, e.g. biometricians, statisticians. While there is no limit to the membership of AECs, it is important that there is reasonable balance between the various categories on AECs and reasonable balance between members from within the institution and members from outside the institution. The Code (2.2.6) requires that Categories C plus D represent no less than one third of the committee. Additionally, AECs may co-opt people from time to time to provide expertise on specific issues, or seek written advice.

12 It is considered advantageous for the Chairperson of an institutional AEC to have a senior position in that organisation to ensure that recommendations made by the AEC are implemented quickly and effectively. A Chairperson based outside an institution may also be more difficult to contact in emergencies.

However, "should" rather than "must" is used in this paragraph in recognition that exceptions may be entirely satisfactory, e.g. a senior person with managerial skills and access to and support from the institution's management. This may be appropriate, e.g. in a small institution where the senior positions are filled by the people who also conduct the bulk of the research.

Written proposals

- 2.2.9 Written proposals should place before the AEC sufficient information to satisfy the AEC that the proposed use of animals is justified and complies with the principles of Replacement, Reduction and Refinement.
- 2.2.10 Written proposals should be presented in a form that allows the AEC to easily assess information provided. They should be written in a manner that can be understood by all members of the AEC and must identify the impact of all sections of the proposal on animals used and means by which the impact will be minimised.
- 2.2.11 Written proposals should contain the following information as appropriate:
- (i) the project title;
 - (ii) the names and qualifications of the responsible investigators and all others involved directly;
 - (iii) an explanation of how these qualifications and experience are appropriate to the procedures to be performed and to the species to be used;
 - (iv) a clear description in lay terms of
 - the scientific or educational aims of the project; and
 - the expected benefits;
 - (v) justification of the project which should address how it will
 - increase our understanding of humans or animals;
 - maintain or improve human or animal health and welfare;
 - improve animal management or production; or
 - achieve the ecological or educational objectives;
 - (vi) reasons why animals are necessary for the project and, in particular, why techniques which do not use animals have been rejected as unsuitable;
 - (vii) details of what happens to animals from the time they are obtained until the time the project is completed. This should include a description of
 - experimental and other procedures, including dose and route of any substance administered;
 - surgical and related procedures, including doses of anaesthetic, analgesic and tranquillising agents and methods of monitoring their adequacy;
 - conditions of handling and housing; and
 - arrangements for the disposal of animals at the completion of the study, including methods of euthanasia if applicable.
 - (viii) identification and justification of all aspects of animal use including handling and housing which may impact on an animal's wellbeing. Methods to minimise distress or pain must be detailed.

- (ix) details of how animals will be monitored including
 - methods and frequency of monitoring both to assess the impact of procedures and to ensure the general well-being of an animal on a day to day basis;
 - personnel involved;
 - details of who will be responsible for the management of emergencies and how it will be ensured that nominees can be contacted;
- (x) number and species of animals required, and justification on the basis of experimental design and statistical considerations¹³;
- (xi) source of the animals, and any necessary permits;
- (xii) justification for any repetition of previously performed studies;
- (xiii) details and justification of procedures which may cause pain or distress but in which anaesthesia and analgesia cannot be used. The planned end-point and the reasons for its choice should be provided. If death as an end-point cannot be avoided, it must be justified. Measures to be taken to minimise pain or distress, including monitoring, must be detailed;
- (xiv) identification of and justification for the use of any animal that has been the subject of a previous scientific or teaching activity, including details of the prior experience;
- (xv) maximum time individual animals will be held¹⁴;
- (xvi) any additional features of the proposal which raise special ethical considerations;
- (xvii) any health risks to other animals or staff;
- (xviii) expected commencement and completion dates of the project; and
- (xix) a declaration signed by the responsible investigator(s) or teacher(s) stating that he or she is currently licensed or authorised to perform scientific or teaching activities using animals (if required by legislation), and is aware of responsibilities set out in this Code and in applicable legislation.

13 The appropriate number of animals (neither too few nor too many) should be used to satisfy statistical requirements.

14 Special attention should be given to animals held longterm to ensure adequate monitoring.

Operating procedures

- 2.2.12 AECs must ensure that operating procedures are established which will enable compliance with the provisions of this Code. Such procedures should cover in particular:
- (i) establishment of a quorum for meetings which must include at least one member from each Category A, B, C and D;¹⁵
 - (ii) any matter specific to the institution that will assist compliance with this Code; and
 - (iii) powers that the AEC is prepared to delegate to an Executive.
- 2.2.13 The AEC may establish an Executive which must include at least one external member from Categories C or D. The Executive may approve minor modifications to projects and deal with emergencies¹⁶, but any decisions by the Executive must be reviewed by the AEC at its next meeting¹⁷.
- 2.2.14 The Executive may not approve proposals.
- 2.2.15 Minutes must be maintained which record decisions and all other aspects of the AEC's operation.
- 2.2.16 Meetings should be scheduled not less than quarterly, and more frequently as required.
- 2.2.17 The process by which decisions are made must be fair to investigators and teachers, and acceptable to all AEC members.
- 2.2.18 Irreconcilable differences between the AEC and an investigator or teacher must be referred to the governing body of the institution for review.¹⁸

15 AEC membership should be such that absenteeism will not result in failure to reach a quorum or lack of balance within the committee.

16 The AEC may need to put in place procedures to deal with the immediate use of animals for the diagnosis of unexplained and severe disease outbreaks.

17 In larger committees, where there are two or more members from Categories C and D, it is preferable that the Executive have representatives of both Categories C and D.

18 See 2.1.1(xii).

Assessing proposals

- 2.2.19 Only those scientific or teaching activities which conform to the requirements of all relevant sections of this Code and of legislation may be approved.
- 2.2.20 Proposals must be considered and approved only at meetings of the AEC.
- 2.2.21 Where possible, decisions on approvals of proposals should be made on the basis of consensus.¹⁹
- 2.2.22 Investigators and teachers must be informed of decisions in writing.
- 2.2.23 A register of all approved projects must be maintained.
- 2.2.24 Decisions must be made as promptly as possible.
- 2.2.25 Scientific or teaching activities involving the use of animals must not start before written approval is given.

Monitoring

- 2.2.26 AECs must ensure that adequate records are kept on the acquisition, breeding, health, care, housing, use and disposal of animals.²⁰
- 2.2.27 Inspections of all animal housing and laboratory areas must be conducted regularly by members of the AEC and appropriate records maintained to ensure compliance with the Code.²¹
- 2.2.28 AECs must ensure that any activity in breach of this Code ceases immediately and appropriate action is taken. This may include referral to the Head of the institution.
- 2.2.29 On each site where animals are used, the AEC should nominate a person who is authorised to respond to emergencies. Where possible, this person should be a member of the AEC.
- 2.2.30 Large institutions with multiple sites of animal care and use should consider the appointment of an Officer with veterinary or other appropriate qualifications. This person would be authorised by the AEC to ensure compliance with the Code and with the decisions of the AEC.
- 2.2.31 In cases of emergency, before an animal is treated or killed, all reasonable steps must be taken to consult with the responsible investigator and the Chairperson of the AEC. Any such action must be reported promptly in writing to the responsible investigator and the AEC, including reasons for the action taken.

¹⁹ Where two or more members oppose a proposal, it should not be approved until the AEC has explored ways of modifying the project that may lead to consensus.

²⁰ See also 3.1.10 and 3.3.11

²¹ Difficulties may be experienced by AECs in monitoring field work and work in remote locations. AECs must ensure that adequate records are kept, that appropriate emergency procedures are in place for each project, and that those persons involved have appropriate skills and knowledge of current techniques.

Annual review

- 2.2.32 Approved projects of long duration and the long-term continuing use of individual animals must be reviewed annually by the AEC or more frequently if considered desirable.

Report to institution

- 2.2.33 The AEC must report in writing at least annually to the governing body of the institution on its activities, on:
- numbers and types of projects approved;
 - the physical facilities for the care and use of animals within the institution;
 - administrative or other difficulties being experienced; and
 - any requirements for training staff.

Categorising proposals

- 2.2.34 The AEC may adopt or develop a system to categorise proposals, to help identify areas of special concern.

Projects at more than one institution

- 2.2.35 Where projects are to be conducted at more than one institution, AEC approval should be sought from each institution unless responsibility has been formally delegated to one AEC.
- 2.2.36 When responsibility has been formally delegated to another institution, the investigator should notify the AEC in writing at his/her own institution that there is approval elsewhere for a project.

Section 3: Responsibilities of investigators and teachers

3.1 General

- 3.1.1 Investigators and teachers have direct and ultimate responsibility for all matters related to the welfare of their animals. They must act in accord with all requirements of this Code.
- 3.1.2 The responsibility of investigators and teachers extends over all facets of the care and use of animals in projects approved by the AEC. This responsibility begins when the animal is allocated to the approved project and ends at the time of disposal of the animal.
- 3.1.3 Investigators and teachers are responsible for the standard of animal care and use by all other persons involved in the study. They must ensure that the extent of supervision is compatible with the level of competence of each person and the responsibilities they are given.
- 3.1.4 Investigators and teachers should consult other experienced scientists, veterinarians, or laboratory animal, livestock or wildlife specialists when necessary.
- 3.1.5 Before any scientific or teaching activity involving the use of animals begins, investigators or teachers must submit a proposal to the AEC which demonstrates that the project will comply with the conditions of this Code and relevant legislation.
- 3.1.6 Investigators or teachers must not begin a scientific or teaching activity involving the use of animals before written AEC approval is obtained, and must adhere to any requirements of the AEC.
- 3.1.7 Investigators and teachers must ensure that satisfactory arrangements are made for contacting them and other responsible persons in the event of emergencies.
- 3.1.8 Investigators and teachers must ensure that the choice of species is appropriate for the purpose of the project. Requirements for known genetic constitution, freedom from specific diseases, documented health, nutritional and environmental histories and other relevant factors should be taken into account. When the definition of the biological status of animals is necessary, investigators must ensure that the supplier can provide adequate proof of definition. Where relevant, species and individual animals should be chosen on the basis that the proposed studies will result in the least pain and distress. In making this decision, all aspects of the biological nature of the animals, including their behavioural characteristics and their cognitive development, should be taken into account.

- 3.1.9 Investigators and teachers must ensure that records of the use and monitoring of animals in scientific and teaching activities are maintained.
- 3.1.10 Investigators and teachers must inform the AEC when an approved project is completed or discontinued.
- 3.1.11 The investigator should promptly notify the AEC of any unexpected or adverse effects which occur during the period of the approved project and which impact on the welfare of the animals.

3.2 Planning projects

- 3.2.1 In addition to the information required by the AEC, the investigator or teacher needs to address the following questions during the planning stages of a project:
 - (i) Is the project justified ethically and scientifically?
 - (ii) Can the aims be achieved without using animals?
 - (iii) Has the most appropriate species of animal been selected?
 - (iv) Are suitable holding facilities and competent staff available?
 - (v) Have all staff been informed of the planned experimental and other procedures?
 - (vi) Is the biological status (genetic, nutritional, microbiological, general health) of the animals appropriate?
 - (vii) Are the environmental conditions (including caging or pen type, noise, photoperiod, temperature, humidity, ventilation, density of housing, and social structures) appropriate?
 - (viii) Are the studies designed so that statistically valid results can be obtained or the educational objectives achieved, using the minimum necessary number of animals?
 - (ix) If the scientific or teaching activity could cause the animals any pain or distress, what will be done to minimise or avoid this?
 - (x) What arrangements will be made to monitor the animals adequately?
 - (xi) Have any of the studies been performed previously? If so, why should they be repeated?
 - (xii) Are there any permits that must be obtained for the importation, capture, use, destruction or release of the animals?

3.3 Conduct of studies

General considerations

Limiting pain and distress

- 3.3.1 Pain and distress cannot be evaluated easily in animals, and therefore investigators or teachers must assume that animals experience pain in a manner similar to humans. Decisions regarding their welfare in scientific and teaching activities must be based on this assumption unless there is evidence to the contrary.
- 3.3.2 The investigator or teacher must anticipate and take all possible steps to avoid or minimise pain and distress, including:
- (i) choosing the most humane method for the conduct of the study;
 - (ii) ensuring the technical skills and competence of all persons involved in animal care and use;
 - (iii) ensuring that animals are adequately monitored for evidence of pain and distress;
 - (iv) acting promptly to alleviate pain or distress;
 - (v) using anaesthetic, analgesic and tranquillising agents appropriate to the species and the scientific or educational aims;
 - (vi) conducting studies over the shortest time practicable; and
 - (vii) using appropriate methods of euthanasia.
- 3.3.3 The use of local or general anaesthetics, analgesics or tranquillisers must be appropriate to the species, and should at least parallel their use in current medical or veterinary practice.
- 3.3.4 Scientific and teaching activities which are liable to cause pain of a kind and degree for which anaesthesia would normally be used in medical or veterinary practice must be carried out under anaesthesia.
- 3.3.5 Distress can sometimes be avoided or minimised by non-pharmacological means. Before a study begins, animals should be appropriately conditioned to the study environment and procedures, and be familiar with handlers. During and after experimental procedures, appropriate nursing to minimise pain and distress, and to promote the well-being of the animals, must be provided.
- 3.3.6 The monitoring of animals must at all times be adequate to prevent the occurrence, or allow prompt alleviation, of pain or distress.
- 3.3.7 If animals develop signs of severe pain or distress despite the precautions outlined above, they must have the pain or distress alleviated promptly or must be killed humanely and without delay. Alleviation of such pain or distress must take precedence over continuing or finishing the study.

Signs of pain or distress

- 3.3.8 Investigators and teachers should be familiar with the normal behaviour of the animal species chosen, be knowledgeable of signs of pain and distress specific to that species, and must monitor their animals for these signs.
- 3.3.9 Animals must be monitored to allow detection of deviations from normal behaviour patterns. Such deviations are often the first indications that animals are experiencing pain or distress. Assessments of change in patterns of sleeping, feeding, drinking, grooming, exploratory behaviour, performance in learning or discriminatory tasks, reproduction or social behaviour should be made.
- 3.3.10 Animals must be monitored appropriately for clinical signs of pain or distress. These may include one or more of the following: aggressive and/or abnormal behaviour (some species may become unduly submissive), abnormal stance or movements, abnormal sounds, altered cardiovascular and/or respiratory function, abnormal appetite, rapid decline in bodyweight, altered body temperature, vomiting and abnormal defecation or urination. Indicators of sustained pain or distress may include loss of body weight, failure to thrive, impaired reproductive ability and reduced resistance to disease.

Repeated use of animals in scientific and teaching activities

- 3.3.11 Individual animals must not be used in more than one study either in the same or different projects, without the express approval of the AEC. However appropriate re-use of animals may reduce the total number of animals used in a project, result in better experimental design, reduce distress or avoid pain to other animals.
- 3.3.12 When approving studies involving the re-use of animals, the AEC must be satisfied that either, (i) none of the procedures cause the animals pain or distress; or (ii) the second and subsequent studies produce little or no pain or biological stress to the animals (e.g. modifying diet, taking a succession of blood samples, repeated non-invasive recording procedures) and that the animals have recovered fully from the first study before further procedures are carried out.

Duration of scientific and teaching activities

- 3.3.13 Scientific and teaching activities, particularly those which involve any pain or distress, should be as brief as practicable. AEC approval must be sought for the continued long-term use of individual animals. The decision to continue must be based on the clinical well-being of the animal and the absence of aversion to the experimental situation.

Handling and restraining animals

- 3.3.14 Animals must be handled only by persons instructed and competent in methods which avoid distress and do not cause injury.
- 3.3.15 The use of restraint devices is sometimes necessary for the welfare of the animal and the safety of the handler. Restraint devices must be used to the minimum extent, for the minimum period required to accomplish the purpose of the study and be appropriate for the animal.

- 3.3.16 Tranquillisers or anaesthetics may aid restraint but may prolong recovery from the procedure. When these agents have been used, recovery of the animals must be monitored.
- 3.3.17 Periods of prolonged restraint should be avoided. Where animals are in prolonged restraint, consideration must be given to their biological needs, including their behavioural requirements, and they must be monitored regularly by a veterinarian or other qualified person not participating in the project. If any ill effects are shown, the animal must be removed from the restraint, or the method modified.

Completion of projects

- 3.3.18 Upon completion of the project, animals must be returned promptly to either normal husbandry conditions or, if appropriate and permitted, to their natural habitat, or be killed humanely.
- 3.3.19 Where practicable investigators should share with other investigators tissue from animals being killed.

Humane killing of animals

- 3.3.20 When it is necessary to kill an animal, humane procedures must be used. These procedures must avoid distress, be reliable, and produce rapid loss of consciousness without pain until death occurs. The procedures should also be compatible with the scientific or educational aims.
- 3.3.21 The procedures must be performed only by persons competent in the methods to be used, or under the direct supervision of a competent person. The appropriate means must be readily at hand.
- 3.3.22 Animals should be killed in a quiet, clean environment, and normally away from other animals. There should be no disposal of the carcass until death is established.
- 3.3.23 Dependent neonates of animals being killed must also be killed or provision made for their care.
- 3.3.24 When fertilised eggs are used, the method of disposal must ensure the death of the embryo.

Autopsy

- 3.3.25 Autopsy should be performed when animals die unexpectedly.

Additional considerations

- 3.3.26 Anaesthesia and surgery must be performed by competent staff with appropriate training and experience. Instruction in surgical or anaesthetic techniques must be under the direct and constant supervision of such persons.

Surgery

- 3.3.27 Surgical procedures must be carried out under appropriate local or general anaesthesia. There must be adequate monitoring for the depth of anaesthesia and of side effects such as hypothermia, and cardiovascular and respiratory depression.
- 3.3.28 The choice and administration of anaesthetic, analgesic and tranquillising agents must be suitable for the species and appropriate for the purpose of the study.
- 3.3.29 When more than one surgical procedure is to be performed the animal must have recovered to good general health between each procedure. Every effort must be made to reduce the total number of procedures and the AEC must have been informed specifically of the need for more than one.
- 3.3.30 When the animal is not to recover from the surgery, it must be unconscious for the whole procedure, either by continuing the administration of the general anaesthetic or by inducing brain death.
- 3.3.31 When the animal is to recover from the anaesthetic, surgical procedures must conform to accepted standards in human and veterinary practice. Analgesics and tranquillisers must be used when required and their use should parallel that in current medical and veterinary practice.

Post-operative care

- 3.3.32 The comfort of animals must be promoted throughout the post-operative period. Attention should be given to warmth, hygiene, fluid and food intake, and control of infection. The use of analgesics and tranquillisers may be needed to minimise post-operative pain or distress. Care should be taken that animals recovering from anaesthesia do not injure themselves by uncoordinated movements, and that conditions are such that they are not disturbed, attacked or killed by other animals in the same enclosure.
- 3.3.33 Appropriate clinical records must be kept, accessible to all involved in the post-operative care of the animal.
- 3.3.34 Investigators must ensure that adequate monitoring, treatment and care of post-operative animals is provided. They must ensure that they are fully informed of the animals' condition.
- 3.3.35 The duties of all staff must be clearly defined and ways of dealing with emergencies established.
- 3.3.36 Any post-operative animal observed to be in a state of severe pain or distress which cannot be alleviated quickly must be killed humanely without delay.²²
- 3.3.37 Regular observation of surgical wounds is essential to check the progress of healing. Any problems must be attended to immediately.

²² See also 2.2.31.

Implanted devices

- 3.3.38 Skilled and specialised attention is required in the care of animals following an operation in which monitoring or sampling devices have been implanted, or a fistula created. Regular observation is essential to determine signs of distress, pain or infection, which must be treated immediately.

Neuromuscular paralysis

- 3.3.39 Neuromuscular blocking agents must not be used without adequate general anaesthesia or an appropriate surgical procedure which eliminates sensory awareness. Immobilisation of an animal solely with a neuromuscular blocking agent is not acceptable. When these agents are used with an anaesthetic, special care must be taken to ensure the maintenance of an adequate plane of anaesthesia. Since criteria such as the character of respiration and corneal and flexor withdrawal reflexes cannot be used, continuous or frequent intermittent monitoring of physiological variables such as heart rate, blood pressure, pupil size and the electroencephalogram is necessary, together with the effects on these of mild sensory stimuli. Care is required to ensure that drugs used during procedures do not interfere with this monitoring.

Electroimmobilisation

- 3.3.40 Electroimmobilisation must not be used as an alternative to analgesia or anaesthesia. When its use is proposed for the restraint of animals, AECs must carefully evaluate published evidence to assess whether it may cause distress. If so, an alternative restraint method must be used.

Animal models of disease

- 3.3.41 The scientific validity of animal models of human diseases rests in part on how closely they resemble a particular disease. Thus the attendant pain and distress of the human diseases may also occur in the animal. Special care must be taken in selecting the appropriate species and the investigator must accept responsibility for ensuring that any pain or distress is minimised and that the AEC is informed of the potential effects of the disease on the animals. The use of painful, distressful or lingering death as an end-point in these studies must be avoided wherever possible.

Modifying animal behaviour

- 3.3.42 Procedures used to modify an animal's behaviour or to induce it to perform specific tasks depend on motivating the animal. The preferred inducement is positive reinforcement, but the inducement may be some form of biological stress. This stress should be as mild as possible. Severe water, food, social or sensory deprivation must not be used. Painful or noxious stimuli must be limited to those which do not distress human beings, and must be used for the minimum time necessary. Behaviour can usually be modified using procedures that involve no more than a physiological stress, e.g. thirst within the range of the normal experience of the species.

Toxicological studies

- 3.3.43 Investigation of the safety of agents intended for use in human beings, animals, the household or the environment, or of naturally occurring toxins, should be performed by persons with appropriate training. If suitable non-animal tests are available, they must be used. In particular, *in vitro* methods should be used as an initial screening test wherever possible.
- 3.3.44 The end-point of such studies must be as early as is compatible with reliable assessment of toxicity, and must minimise the extent of any pain and distress.
- 3.3.45 Investigators must not allow scientific activities to proceed to the painful or distressful or lingering death of animals unless no other experimental end-point is feasible and the goals of the study are the prevention, alleviation, treatment or cure of a life-threatening disease or situation in human beings or animals.
- 3.3.46 When death is essential as the end-point, the study must be designed to result in the deaths of as few animals as possible.

Scientific and teaching activities involving hazards to humans or other animals

- 3.3.47 Hazards may arise from sources including viruses, bacteria, fungi, parasites, radiation, radioactivity, corrosive substances, toxins, allergens, carcinogens, recombinant DNA, anaesthetic gases and physical injuries.
- 3.3.48 Any potential pathogenic effects of these hazards when used in studies must be explained as far as possible to all staff. Tests before, during and after the study may be required for staff.
- 3.3.49 The AEC should check that the advice of the institution's biohazards committee has been sought and that appropriate measures for containment, disposal and decontamination have been established.
- 3.3.50 Animals being administered infectious organisms should be quarantined as appropriate, taking into account risks to other animals and to people.
- 3.3.51 The end-point of studies involving hazardous agents should conform to the requirements for toxicological studies.
- 3.3.52 Precautions, security and emergency plans to contain hazardous agents must be appropriate to a 'worst-case' situation.

Animal welfare and animal health research

- 3.3.53 When studying ways of improving the health or welfare of animals, investigators may need to design studies that replicate the problem such as injury, trauma, nutritional disorder, physical exertion, disease or environmental stress. Thus, the attendant pain or distress may also be replicated. When such studies are necessary, the investigator must ensure that:
 - (i) the principal aim of the project is to improve animal welfare or health;
 - (ii) alternative methods are not possible, such as the use of animals already subjected to the problem;

- (iii) all possible steps are taken to minimise any pain or distress; and
- (iv) the end-points of studies conform to the requirements for toxicological studies.

Experimental manipulation of animals' genetic material

- 3.3.54 All work involving the introduction of foreign DNA into mammalian cells or whole animals must be conducted in accord with guidelines issued by the Genetic Manipulation Advisory Committee and the relevant biohazards committee of the institution.
- 3.3.55 All proposals to manipulate the genetic material of animals, their germ cells or embryos must also be submitted to an AEC for approval.
- 3.3.56 The manipulation of the genetic material of animals has the potential to affect the welfare of the animals and their offspring adversely. Investigators must inform the AEC of the known potential adverse effects on the well-being of the animals.
- 3.3.57 The clinical status of animals in which the genetic material has been manipulated experimentally must be monitored for unusual or unexpected adverse effects. Investigators must report such effects to the AEC.

Experimental induction of neoplasia

- 3.3.58 The site for induction of tumours (neoplasia) must be chosen carefully. Subcutaneous, intradermal and flank sites should be chosen when possible. Footpad, brain and eye sites must not be chosen unless there is no alternative.
- 3.3.59 Investigators must monitor their animals closely for signs of pain or distress, especially sudden changes in body weight.
- 3.3.60 Animals with experimentally induced tumors must be killed humanely before predictable death occurs, cachexia becomes advanced, or the tumor becomes large enough to cause ulceration or severe limiting of normal behaviour.
- 3.3.61 With ascitic tumors, including hybridomas, investigators must ensure that the volume of ascitic fluid does not cause gross abdominal distension, and the volumes of solid tumors and cachexia do not become distressful to the animals.
- 3.3.62 In tumor therapy studies, the end-points chosen must be as early as possible, compatible with reliable assessment of the therapy. Weight changes must be monitored closely. Death from the tumor must not be chosen as an experimental end-point.

Lesions of the central nervous system

- 3.3.63 Anatomical or chemical lesions of the central nervous system have been widely used to study its structure and function in health and disease. These studies demand special consideration when the lesion produces loss or impairment of limb or trunk movements, loss of sensibility to touch, temperature or pain, impairment of the animal's awareness of its surroundings or impairment of appetite or thirst mechanisms. Special animal care, caging, and other facilities

may be needed, and the AEC, in approving such studies, has a particular responsibility to ensure that these facilities are available and that the condition of the animals is closely monitored.

Withholding food or water

3.3.64 Studies involving the withholding or severe restriction of food or water should produce no continuing detrimental effect on the animal. In these studies, the fluid balance and/or body weight must be monitored, recorded and maintained within the limits approved by the AEC.

Fetal experimentation

3.3.65 When fetal experimentation or surgery compromises the ability of the neonate to survive and be without pain or distress, it must be killed humanely before or immediately following birth unless such pain or distress can be relieved.

3.3.66 Unless there is specific evidence to the contrary, investigators must assume fetuses have the same requirements for anaesthesia and analgesia as adult animals of the species.

3.3.67 During surgery of the mother, consideration must be given to any special requirements for anaesthesia of the fetus.

3.3.68 Eggs must be destroyed before hatching, unless hatching is a requirement of the study. The AEC must approve the arrangements made for the hatchlings.

Research on pain mechanisms and the relief of pain

3.3.69 In studies in which unanaesthetised animals are to be subjected to stimuli designed to produce pain, investigators must:

- (i) ensure that these stimuli limit pain at all times to levels comparable to those which do not distress human beings;
- (ii) ensure that the animals are exposed to the minimum pain necessary for the purpose of the procedure; and
- (iii) provide treatment for the relief of pain, or allow self-administration of analgesics, or escape from repetitive, painful stimuli, when possible.

Section 4: Acquisition and care of animals in breeding and holding areas

Animals should be obtained from breeding and supply facilities which maintain conditions consistent with this Code of Practice or relevant industry Code.

4.1 Animals obtained from other States or countries

There are a number of requirements governing the import, capture, handling and transport of animals. Some requirements are listed below. It should be noted that this list is not comprehensive and it is the responsibility of the investigator to consult the relevant State and Territory authorities to ensure compliance with all requirements.

- 4.1.1 Under quarantine and fauna laws and formal agreements, the Commonwealth and individual States and Territories regulate the movement of animals or animal tissues into Australia and across State and Territory borders within Australia.
- 4.1.2 A Certificate of Health may be required to accompany animals travelling interstate and this is normally issued by State or Territory Departments of Agriculture or their equivalent.
- 4.1.3 For native fauna, the appropriate State or Territory fauna authority may require further certification that animals will be taken legally.
- 4.1.4 Permits must be obtained from Biodiversity (Australia) [formerly ANCA] for the importation of live animals, except for those species which are specifically exempt. The Australian Quarantine and Inspection Service (AQIS) should also be contacted.
- 4.1.5 Permits are also required by Biodiversity (Australia) and AQIS for the importation of dead animal specimens and animal tissues.
- 4.1.6 Permits must be obtained from Biodiversity (Australia) for the export of both live and dead specimens of all native Australian fauna. Prior approval is also required from Biodiversity (Australia) for export of some animal species not native to Australia (e.g. non-human primates).

4.2 Transport of animals

- 4.2.1 Transportation can cause distress due to confinement, movement, noise and changes in the environment and personnel.
- 4.2.2 The extent of any distress will depend on the animals' health, temperament, species, age, sex, the number travelling together and their social relationships, the period without food or water, the duration, the mode of transport, environmental conditions, particularly extremes of temperature, and the care given during the journey.
- 4.2.3 The conditions and duration of the transport must ensure that the health and well-being of the animals are not unduly compromised.
- 4.2.4 Potential sources of distress should be identified and steps taken to avoid or minimise their effects on the animals.
- 4.2.5 Containers must be escape and tamper-proof, there must be adequate nesting or bedding material and animals must be protected from sudden movements and extremes of climate.
- 4.2.6 Food and water must be provided when necessary.
- 4.2.7 Transport by air should be in accord with IATA regulations and domestic transport of livestock must be in accord with the relevant Codes of Practice.
- 4.2.8 Both the suppliers and recipients of animals must ensure that there are satisfactory delivery procedures, with animals received by a responsible person.

4.3 Admission of new animals into holding areas

- 4.3.1 When new animals are being admitted into animal holding areas, they should be quarantined and inspected by a qualified person. Their health should be evaluated, treatment instigated if required, and their suitability for the proposed studies assessed. This period should allow their acclimatisation to the holding facility and staff.
- 4.3.2 Animals which do not adapt satisfactorily to their new environment should not be kept.

4.4 Care of animals in holding and production facilities

- 4.4.1 Facilities include the buildings, yard or paddocks in which animals are kept.
- 4.4.2 Investigators, AECs and the institutions must ensure that facilities are appropriately staffed, designed, constructed, equipped and maintained to achieve a high standard of animal care and fulfil scientific requirements.
- 4.4.3 The design and management of facilities will depend on the type of animals to be kept and the studies to be undertaken. The overall condition and management of facilities must permit effective maintenance and servicing and be compatible with maintaining the animals in good health.

Outdoor holding areas

- 4.4.4 These must be compatible with the needs of the species, provide adequate shelter and water, protect the animals from predation and meet other species-specific needs.

Indoor housing

- 4.4.5 Buildings should be compatible with the needs of the animals to be housed, and the studies undertaken. Facilities for free movement and group contact are specially important for some species of animals.
- 4.4.6 Buildings should be designed and operated to control environmental factors appropriately, to exclude vermin and to limit contamination associated with the keeping of animals, the delivery of food, water and bedding, and the entry of people and other animals.
- 4.4.7 Buildings must be maintained in good repair. Walls and floors should be constructed of durable materials that can be cleaned and disinfected readily.
- 4.4.8 Buildings must be kept clean and tidy, and operated to achieve the effective control of vermin.
- 4.4.9 There must be adequate storage areas for food and equipment.
- 4.4.10 Detergents, disinfectant, deodorants and pesticides may contaminate the animals' environment and choice of agents should be made in consultation with investigators.
- 4.4.11 There should be a reticulated water supply and proper facilities for drainage, if appropriate.
- 4.4.12 There must be adequate contingency plans to cover such emergencies as the breakdown of lighting, heating or cooling.
- 4.4.13 Precautions should be taken against the entry of unauthorised persons.

Environmental factors

- 4.4.14 Animals must be provided with environmental conditions which suit their behavioural and biological needs unless otherwise approved by the AEC for the purposes of a project.
- 4.4.15 Air exchange, temperature, humidity, light and noise should be maintained within limits compatible with the health and well-being of the animals.
- 4.4.16 Effective ventilation is essential for the comfort of animals and the control of temperature, humidity, and odours. Ventilation systems should distribute air uniformly and achieve adequate air exchange.
- 4.4.17 Noxious odours, particularly ammonia, must be kept to a level compatible with the health and comfort of the animals and staff. The adequacy of the ventilation system, the design, construction and placement of cages and containers, population densities both within cages and within a room, the effectiveness of the cleaning and the frequency of bedding changes, will all influence the level

of noxious gases. Attention should be given to the balance between the need for cleanliness and the potential impact of cleaning procedures on the animals.

- 4.4.18 These environmental factors potentially affect the welfare of the animals and may affect the results of scientific and teaching activities. Investigators should be informed in advance of planned changes to the environmental conditions of their animals.

Food and water

- 4.4.19 Animals must receive appropriate, uncontaminated and nutritionally adequate food according to accepted requirements for the species. The food should be in sufficient quantity and of appropriate composition to maintain normal growth of immature animals or normal weight of adult animals and the requirements of pregnancy or lactation. Consideration should be given to providing variety in the composition and presentation of food. Uneaten perishable food should be removed promptly unless contrary to the needs of the species.
- 4.4.20 Drinking water should be constantly and reliably available, and be clean, fresh and uncontaminated.
- 4.4.21 Variations to these requirements as part of a study design must receive prior AEC approval.

Pens, cages and containers and the immediate environments of the animals

- 4.4.22 Animal accommodation should be designed and managed to meet species-specific needs. Pens, cages and containers should be constructed and maintained to ensure the comfort and well-being of the animals. The following factors should be taken into account:
- (i) species-specific behavioural requirements, including the availability and design of space to enable free movement and activity, sleeping, privacy, and contact with others of the same species;
 - (ii) provision of single housing for animals when it is appropriate for the species and if necessary for the purpose of the study, e.g. during recovery from surgery or collection of samples;
 - (iii) species-specific environmental requirements such as lighting, temperature, air quality, appropriate day/night cycles and protection from excessive noise and vibrations;
 - (iv) the need to provide ready access to food and water;
 - (v) the need to clean the pen, cage or container;
 - (vi) protection from spread of pests and disease;
 - (vii) requirements of the study; and
 - (viii) the need to observe the animals readily.

- 4.4.23 Pens, cages and containers must:
- (i) be constructed of durable, impervious materials;
 - (ii) be kept clean;
 - (iii) be maintained in good repair;
 - (iv) be escape-proof;
 - (v) protect the animals from climatic extremes;
 - (vi) not cause injury to the animals;
 - (vii) be large enough to ensure the animals' well-being; and
 - (viii) be compatible with the behavioural needs of the species.
- 4.4.24 The population density of animals within cages, pens or containers and the placement of these in rooms must be such that acceptable social and environmental conditions for the species can be maintained. Where it is necessary to individually house animals of a species which is normally kept in a social group, the conditions should be managed so as to minimise the impact of social isolation. Animals should be housed in these circumstances for the minimum time necessary.
- 4.4.25 Bedding and litter must be provided if appropriate to the species, and should be comfortable, absorbent, safe, non-toxic, able to be sterilised if needed, and suitable for the particular scientific or educational aims. Pregnant animals must be provided with nesting materials where appropriate.
- 4.4.26 The AEC and relevant investigators or teachers should be informed in advance of planned changes to these conditions, since these may affect the welfare of the animals and the results of the scientific and teaching activities.

4.5 Management and staff

Person-in-charge

- 4.5.1 Animal acquisition, breeding and holding facilities must be supervised by persons with appropriate veterinary or animal care qualifications or experience.
- 4.5.2 The person-in-charge should be responsible for the management of the day-to-day care of the animals in holding and breeding facilities and for supervising the work of other staff in the facility, and should act as liaison between the investigator and facility staff.
- 4.5.3 The person-in-charge should ensure that there is reliable monitoring of the well-being of all animals by other staff, and be knowledgeable regarding signs of pain, distress and illness specific to each species housed. After animals are allocated to an approved project the investigator has primary responsibility for ensuring adequate monitoring of the animals' well-being.
- 4.5.4 The person-in-charge must ensure that ill or injured animals which are not assigned to approved projects are treated promptly and the cause of death investigated for animals which die unexpectedly.

- 4.5.5 The person-in-charge should contribute to the development and maintenance of the institution's animal care policies and procedures.
- 4.5.6 The person-in-charge must ensure that staff are provided with appropriate protective clothing, maintain high standards of personal hygiene, do not eat, drink or smoke in animal areas, and have all required vaccinations, particularly against tetanus and other zoonoses.
- 4.5.7 The person-in-charge must document procedures used in the management of holding and breeding facilities. These procedures should take into account the requirements of the species held, the studies being conducted, and the health and safety of the staff, and include transport, quarantine and disposal of animals, routine husbandry, prevention, diagnosis and treatment of disease, monitoring of health status and genetic constitution, and physical environmental factors. These procedures should be made known to all staff involved in the care and use of the animals and should be reviewed regularly.
- 4.5.8 The person-in-charge must ensure that adequate records are maintained of:
- (i) the source, care, allocation, movement between locations, use and disposal of all animals, and any diseases developed;
 - (ii) the fertility, fecundity, morbidity and mortality in breeding colonies, in order to monitor the management of the colonies, and to assist detection of the origin and spread of disease; and
 - (iii) the health status, genetic constitution and the physical environment of the animals, when definition of these is required.
- 4.5.9 Records maintained by the person-in-charge must be made available to investigators and teachers.
- 4.5.10 The person-in-charge should ensure that investigators or teachers are informed of any changes to the conditions under which animals are held and which may affect the results of their studies.

Staff

- 4.5.11 The most important factor ensuring high standards of animal care is enough well-trained, committed staff. Personnel working with animals in a holding facility should be appropriately instructed in the care and maintenance of those animals, how they may affect the animals' well-being and how their actions may affect the outcome of scientific and teaching activities.
- 4.5.12 Institutions should encourage and promote formal training in animal science or technology.
- 4.5.13 Personnel employed in the care of animals should be instructed in how to recognise at an early stage changes in animal behaviour, performance and appearance.
- 4.5.14 New appointees who will care for animals must be appropriately instructed in their duties and in institutional policy.

- 4.5.15 Staff should be informed of the important zoonotic diseases of animals under their care and of precautions that should be taken. Regular health checks of staff who handle animals are recommended in the interests of both staff and animals.

4.6 Routine husbandry procedures

- 4.6.1 Husbandry procedures which are not part of an approved project (e.g. clipping coats and nails, vaccinations) must be performed by competent personnel.
- 4.6.2 Routine husbandry procedures on livestock should be carried out in accord with relevant Codes of Practice and legislation.

4.7 Identification of animals

- 4.7.1 Animals must be identified by a method such as tattoo, neckband, individual tag, electronic numbering device, physical mark, or by a label or marking attached to the cage, container, pen, yard or paddock in which the animals are kept.
- 4.7.2 The person-in-charge of the facility is responsible for ensuring that animals are identified before allocation to an approved project, after which time both the person-in-charge and the investigator are responsible.
- 4.7.3 The method of identification should be reliable and cause the least stress possible.

4.8 Disposal of animal carcasses and waste

- 4.8.1 Appropriate provision must be made for prompt and sanitary disposal of animal carcasses and waste material in accord with any Commonwealth, State or Territory legislation, local council by-laws and community standards.

Section 5: Wildlife studies

This section refers to free-living vertebrates or those captured from free-living populations, including both native, non-indigenous and feral species. It should be read in conjunction with the rest of this Code.

All activities involving wildlife performed to acquire, develop or demonstrate knowledge or techniques in any scientific discipline require AEC approval.

5.1 Wildlife captured from natural habitats

- 5.1.1 Many species of wildlife are protected by State laws. Officers of State and Territory conservation authorities must be consulted when these species are required. Permits are usually necessary to collect, keep, release or kill protected fauna, and further permits are usually required to import or export such species between or through States. Any conditions imposed on permits must be observed.
- 5.1.2 Observation studies of free-living animals have the potential to cause adverse effects because of interference with the normal behaviour of the animals, particularly if there is an effect on the rearing of young. If interference with animals is substantial, the continuation of the procedure is to be reviewed.
- 5.1.3 Animals should be taken from natural habitats only if animals bred in captivity are not available or are unsuitable for the specific scientific purpose.
- 5.1.4 Investigators and teachers must recognise that field studies have the potential to cause disturbance to the habitat and adversely affect the resources available to both target and non-target species. Efforts must be made to consider the potential for such disturbance and minimise it, both before and during the study.
- 5.1.5 Unnecessary repetition of studies is to be avoided. However, because of the complexity of the interactions between wildlife populations and the environment, replication and long-term studies may be essential to a thorough understanding of the species or the ecosystem and their management.
- 5.1.6 Re-use of individual animals requires AEC approval (see clause 3.3.11). However, the nature of wildlife field studies is such that individual animals may be recaptured, and AECs must be made aware of this possibility by the investigator/teacher.
- 5.1.7 The capture, holding, transport, handling and release of animals from their natural habitat must be in accordance with the principles outlined in the following sub-sections.
- 5.1.8 Investigators and teachers must be aware that the effects of a series of stressors, such as trapping, handling, transportation, sedation, anaesthesia, marking and sampling, can be cumulative, and may produce severe, possibly fatal,

consequences. An assessment of the potential sources of stress and management plans to eliminate or minimise distress must form part of the proposal submitted to the AEC.

- 5.1.9 The risk of disease transmission must be taken into account and appropriate steps taken to clean all materials and equipment used in the capture, holding, transport and manipulation of animals.

5.2 Capture of wildlife

General

- 5.2.1 Capture is stressful to animals, and techniques other than capture should always be considered. Steps must be taken to minimise any distress caused to the captured animals and accidental disruption of the populations from which they are taken. There must be careful choice of suitable capture techniques, skilled persons must be used, and appropriate and safe enclosures or caging must be provided after capture. Animals must be monitored for signs of distress following capture at a frequency and level which will protect the welfare of the animals and remedial steps taken if necessary.
- 5.2.2 Fish related studies are often associated with commercial operations thus commercial harvesting practices may be used for catching fish. Practices which ensure a rapid loss of consciousness, such as stunning, should be used wherever possible.

Use of traps

- 5.2.3 If trapping is to be used, the project proposal must include details as to how the traps will be managed to minimise the impact on both target and non-target species, taking into account issues such as:
- (i) time animals will spend in the traps;
 - (ii) protection of animals from predators or from being parasitised;
 - (iii) protection from environmental effects such as dehydration, hyperthermia and drowning;
 - (iv) deprivation of food and water;
 - (v) potential for impact via disruption of social structure;
 - (vi) potential for impact on their dependent young;
 - (vii) deactivation of traps when not in use or no longer required;
 - (viii) appropriate size of trap - diameter, depth; and
 - (ix) construction of trap - conformation of the walls, lids, covers or grids.
- 5.2.4 Any form of trapping has the potential to cause harm or distress to animals if the trap is not managed correctly. The trapping technique must be appropriate to the species, and must be justified in the project proposal.

- 5.2.5 When traps or nets are used to capture animals in water they must be arranged in such a way as to avoid drowning.
- 5.2.6 The use of wet pitfall traps is unacceptable for the capture of vertebrates. When wet pitfall traps are used for the capture of invertebrates, these traps must be managed so as to minimise the inadvertent capture of vertebrates.

Non-trap capture

- 5.2.7 A wide variety of non-trap capture techniques can also be used in field studies. Similar principles apply as those detailed above for traps. The skill of the operator is essential to ensure minimal impact on target and non-target species.

5.3 Handling and restraint of wildlife

- 5.3.1 Captured free-living animals are to be handled in a way which minimises the risk of injury or stress-induced disease.
- 5.3.2 In particular, the risk of injury or stress-induced disease must be minimised by:
 - (i) firm and quiet handling;
 - (ii) limiting handling and restraint time to the minimum needed to achieve the scientific or educational objectives;
 - (iii) using sufficient competent persons to restrain animals and prevent injury to either animals or handlers;
 - (iv) using techniques and timing appropriate to the species; and
 - (v) using, if appropriate, chemical restraint (including sedation/ tranquillisation) if animals are to be held for more than a short time.
- 5.3.3 Wherever possible, the long-term and short-term consequences of capture, handling and restraint are to be recorded.

5.4 Holding and release

- 5.4.1 The time for which an animal is held should be minimal, consistent with the aims of the study.
- 5.4.2 Animals must be held in a way that minimises stress and/or injury. A knowledge of available information on the normal behaviour of the species and likely response to captivity is essential and must form the basis for management practices.
- 5.4.3 Holding areas and containers must be safe, quiet and hygienic.

- 5.4.4 Close confinement devices, including bags and crates, must:
- (i) allow animals to rest comfortably;
 - (ii) minimise the risk of escape or injury;
 - (iii) be adequately ventilated;
 - (iv) maintain animals within appropriate levels of ambient temperature and humidity; and
 - (v) minimise the risk of disease transmission.
- 5.4.5 Release should be at the site of capture, unless an alternative site is justified in the project proposal.
- 5.4.6 Time of release must be consistent with the species' usual time of movement. Individuals must be released safely, particularly if the time of day for release is less than optimal.
- 5.4.7 At the time of release all reasonable steps must be taken to protect animals from injury and predation.

5.5 Transport

- 5.5.1 Wildlife are particularly susceptible to transport stress and all reasonable steps must be taken to minimise that stress. The general principles for transport detailed in section 4.2 of this Code apply, and particular reference should be made to the wildlife section of the IATA regulations.
- 5.5.2 Stress during transport can be minimised by:
- (i) appropriate size, design and construction of transport containers;
 - (ii) limiting exposure to extremes of temperature, noise, visual disturbance and vibration;
 - (iii) providing, if appropriate for the species, an inner shelter within the transport container;
 - (iv) ensuring that animals are separated where there is incompatibility of species, age, size, sex or reproductive status;
 - (v) preventing unnecessary handling; and
 - (vi) administering tranquillisers, if appropriate, by appropriately trained persons.

5.6 Identification

- 5.6.1 The method of identification of individual animals must be that which causes the least distress within the context of the research proposal and the least interference with the normal functioning of the animal.

5.7 Field techniques

5.7.1 A wide range of minor procedures are used in the field which involve only capture and release, possibly facilitated by tranquilisers or short-acting anaesthetics. Such procedures could include identification (e.g. leg banding, ear tagging, microchipping, radio-tracking devices), examination, measurement, and sampling (e.g. hair, feathers, scales, blood, stomach contents of birds). Such procedures may be carried out, subject to AEC approval, but only if the following requirements are met:

- (i) all procedures are conducted by appropriately qualified and experienced persons, using clean equipment in each instance, in an uncontaminated area;
- (ii) equipment necessary to provide for the health and welfare of the animals and relief of pain is readily available;
- (iii) uneventful recovery to full consciousness should occur in an area in which animals can be readily observed, can maintain normal body temperature, and are protected from injury or predation;
- (iv) the potential impact of the procedures on dependent young is minimised; and
- (v) the methods and equipment used are appropriate to the species.

5.8 Voucher specimens

5.8.1 To be optimally useful a voucher specimen should become part of a publicly accessible reference collection. Therefore:

- (i) voucher specimens should be lodged with a museum or other institution that can properly house and curate them, and make them available for further study;
- (ii) consultation with the institution must take place before collecting to ensure that there is an understanding of the proper preservation and holding techniques, necessary equipment and essential data required; and
- (iii) proper documentation of the specimens, including reasons for collection, is essential. Data should be maintained with the specimens.

5.9 Wildlife interaction studies

5.9.1 Wildlife interaction studies may involve work in the field or under laboratory conditions, and can include interaction between species (predator-prey), within species (competition) or between species and habitat.

5.9.2 The primary ethical considerations with wildlife interaction studies are the degree of manipulation required to set up the interaction, and the additional effect of the observer(s) of the interaction.

- 5.9.3 Wherever possible, efforts should be made to reduce animal usage by employing, for example, modelling theory.
- 5.9.4 Field studies should include the monitoring of animals outside the study, including other species, that may be influenced by the manipulation.
- 5.9.5 In studies of predatory encounters, unstaged natural encounters in the field should be used wherever possible. If staging is required then models rather than live animals should be used wherever possible.

5.10 Feral animal studies

- 5.10.1 The principles set out in this Code apply equally to feral animals.
- 5.10.2 The primary purpose of studies involving feral animals is often to measure the efficacy of methods of killing or control. AECs need to be aware of this, and weigh the project justification carefully. Such justification should address appropriate animal welfare concerns.²³

²³ See also 2.2.11(xiii).

Section 6: Care and use of livestock for scientific and teaching activities²⁴

This section of the Code refers to the special considerations involved when livestock are used to acquire, develop or demonstrate knowledge and techniques. The intention is to clarify when AEC approval is required for the use of livestock. This section should be read in conjunction with the rest of this Code.

6.1 General Principles

- 6.1.1 Unless specifically exempted by an AEC, the care of livestock managed by institutions must at least comply with the *Model Codes of Practice for the Welfare of Animals*. These Codes are listed in the section titled *Information Sources*.
- 6.1.2 AEC approval is required when livestock are used to acquire, develop or demonstrate knowledge and techniques²⁵ including their use for the production of biological products.²⁶ The only exceptions to this are teaching activities defined in clause 6.1.3.²⁷
- 6.1.3 AEC approval is not required for agricultural extension work involving routine procedures if *all* of the following apply:
- (i) the animals are on their home property;
 - (ii) the procedures would occur normally as part of routine management;
 - (iii) the animals are not subjected to anything additional to that which would occur in routine management; and
 - (iv) the teacher is competent to carry out the procedure.

²⁴ Teaching includes demonstrations.

²⁵ This includes standard husbandry procedures or normal farming practices such as mulesing, tail docking and beak trimming when these activities are being researched or taught.

²⁶ Biological products do not include food or fibre.

²⁷ AEC approval is also not required when inspectorial staff are undertaking routine regulatory activities such as lice examinations, disease surveillance, tick control and saleyard work.

6.2 AEC Applications

- 6.2.1 AEC approval is required for teaching or demonstrating routine procedures not covered in clause 6.1.3.
- 6.2.2 To simplify AEC applications, institutions could require the development and use of standard operating procedures (SOPs).²⁸ Once approved by the AEC, the SOPs may be referred to in a project proposal as a means of providing required information on techniques.
- 6.2.3 SOPs may be categorised²⁹ on the basis of their likely impact on the animal. The investigator/teacher must possess the appropriate skills and experience to carry out the procedures outlined in the project proposal.
- 6.2.4 All proposals for scientific or teaching activities not exempt under 6.1.3 or covered by 6.2.2 require a full AEC application as outlined under *written proposals* (clauses 2.2.9 - 2.2.11).³⁰

6.3 Teaching and demonstration requirements for all livestock³¹

- 6.3.1 Facilities must be available to treat animals which may be injured. Treatment may range from a minor procedure to euthanasia.
- 6.3.2 If animals are to be handled there must be a competent person present to protect animals from injury or distress. Animals which do not adapt to the situation should be removed.

28 In developing a SOP the principles of reduction of animal numbers, refinement of procedures to reduce the impact on the animal and replacement of animals by alternative, non-animal techniques should where possible be included.

29 SOPs linked to animal use categories have been prepared in some States. Animal use categories consider the likely welfare impact on animals and/or the skill required to undertake the procedure.

30 An annual return detailing the numbers of all animals maintained at the institution and the purposes for which they are kept (including grass eaters, breeding stock) should be provided to the AEC.

31 This includes commercial ventures held on private property for teaching livestock techniques.

Section 7: The use of animals in teaching

This section refers to the special ethical considerations and issues of responsibilities which must be addressed when animals are used to demonstrate knowledge or techniques in any scientific discipline in schools and tertiary institutions.

The purpose of this section is to emphasise the principles most relevant to schools and tertiary institutions. This section should be read in conjunction with the rest of the Code.

7.1 General Principles

- 7.1.1 Animals are to be used for teaching activities only when there are no suitable alternatives for achieving the educational objectives.
- 7.1.2 All teaching activities which involve the use of animals must have approval by an AEC which is satisfied that there is no suitable alternative to the use of animals, and that the number of animals involved and the impact on them is minimised.
- 7.1.3 Students should be given the opportunity to discuss the ethical, social and scientific issues which are involved in the use of animals for scientific and teaching purposes. Where students are involved in the use of animals as part of their professional training, curricula in the academic discipline involved should include material on such issues.

7.2 Responsibilities of Teachers

- 7.2.1 The person in charge of the students has responsibility for the care and use of the animals from their time of acquisition to the time of disposal and must:
 - (i) ensure that all care and use of the animals is in accord with the provisions of this Code of Practice and all relevant provisions of Commonwealth, State or Territory legislation;
 - (ii) have relevant training and qualifications;
 - (iii) identify whether methods which may replace, reduce or refine the use of animals and which are compatible with the educational objectives are available and, if so, incorporate such methods into the proposed activities;
 - (iv) obtain AEC approval before the activities commence and ensure that activities are conducted as directed and approved by the AEC; and
 - (v) ensure that there is close, competent supervision of all students.

- 7.2.2 The teacher responsible must ensure that, when they are directly involved, students are instructed in the appropriate methods of handling and caring for animals and must demonstrate their ability to perform the necessary tasks with care and competence.
- 7.2.3 Persons supervising students who are undertaking training in research must ensure that prior to using animals, the students receive appropriate instruction in the ethical and legal responsibilities involved in the use of animals for scientific purposes as well as in the appropriate methods for animal care and use. The person supervising such students is responsible for the welfare of the animals used by those students.

7.3 Animals in Schools

- 7.3.1 All schools must have access to an AEC. This may include the establishment of regional or central State AECs for schools.
- 7.3.2 The Head of the school is ultimately responsible for ensuring compliance with this section of the Code.
- 7.3.3 The following activities should *not* be carried out in schools:
- (i) surgical procedures other than normal animal husbandry operations;
 - (ii) induction of infectious diseases;
 - (iii) production of nutritional deficiency giving rise to *distress*;
 - (iv) exposure to stimuli which cause *distress*; and
 - (v) administration of toxins, ionising radiation or other bio-hazardous materials.
- 7.3.4 When the purpose of the activity is for students to interact with animals, the observation of animals in purpose built facilities, in their natural environment or under field conditions should be considered as an alternative to the temporary introduction of animals to the school.
- 7.3.5 Mechanisms must be put in place to ensure that all use of animals in schools is in compliance with the principles of this Code. This may include:
- (i) the establishment of a policy committee;
 - (ii) the designation of a person at each school who is responsible for promoting awareness of these principles;
 - (iii) the acquisition or development of detailed guidelines; and
 - (iv) appropriate teacher training.
- 7.3.6 Detailed guidelines and complete animal care records must be available in schools for inspection at all times.
- 7.3.7 Students must not be allowed to take animals home unless there is clear written undertaking from parents that the animals will be cared for adequately and responsibly.

- 7.3.8 Animals should not be held for longer than necessary. Arrangements for regular and on-going monitoring must be made and holding facilities must be secure against human or animal interference. Since school premises are largely unoccupied for part of each day, on week-ends and vacations, security requires special attention.

Information Sources

The National Health and Medical Research Council (NHMRC) Animal Welfare Committee

NHMRC Animal Welfare Committee Secretariat

Postal Address:

The Secretary, Animal Welfare Committee
NHMRC
Department of Health and Family Services
GPO Box 9848
Canberra ACT 2601
Tel: 61 02 6289 6948
Fax: 61 02 6289 7802

Internet address: <http://www.health.gov.au/hsh/nhmrc/nhmrc.htm>

Publications:

- *A Guide to the Use of Australian Native Mammals in Medical Research. (Sections 1-4)*
- *NHMRC Policy on the Use of Non-human Primates in Medical Research. (forthcoming)*
- *NHMRC Policy on the Care of Dogs Used for Scientific Purposes. (forthcoming)*
- *Ways of Minimising Pain and Distress in Animals in Research: Practical Information for Research Scientists and Animal Experimentation Ethics Committees.*
- *Animals Scientists and You. Resources for Primary School Students.*
- *Guidelines on the Use of Animals for Training Surgeons and Demonstrating New Surgical Equipment and Techniques. (forthcoming)*

Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART)

Executive Officer: Dr R.M. Baker

Postal Address: PO Box 19 Glen Osmond SA 5064

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Other relevant Australian codes of practice or guidelines

Model codes of practice for the welfare of animals are sponsored by the Standing Committee of Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and cover the transport, handling and husbandry of livestock. The following Codes are available from CSIRO Publishing, PO Box 1139, Collingwood, Victoria 3066:

- *Animals at Saleyards (1990)*
- *The Goat (1990)*
- *The Sheep (1990)*
- *Intensive Husbandry of Rabbits (1990)*
- *The Farming of Deer (1990)*
- *Destruction or Capture, Handling and Marketing of Feral Livestock Animals (1990)*
- *Cattle (1992)*
- *Domestic Poultry (1995)*
- *Farmed Buffalo (1995)*

The Codes listed below are currently being reviewed:

- *The Pig (1983)*
- *Road Transport of Livestock (1983)*
- *Rail Transport of Livestock (1983)*
- *Air Transport of Livestock (1986)*
- *Livestock and Poultry at Slaughtering Establishments (Abattoirs, Slaughterhouses and Knackeries) (1986)*
- *Sea Transport of Livestock (1988)*
- *Husbandry of Captive-bred Emus*

The Model Codes listed below are new Codes to be published in the near future:

- Land Transport of Horses
- Land Transport of Pigs
- Land Transport of Cattle
- Land Transport of Poultry
- Land Transport of Goats

Genetic Manipulation Advisory Committee (GMAC)

GMAC Secretariat

Department of Administrative Services

Location: 20 Allara Street, Canberra ACT 2601

Postal Address: GPO Box 2183 Canberra ACT 2601

Tel: 61 02 6213 6490

Fax: 61 02 6213 6462

E-mail address: gmac.secretariat@dist.gov.au

Internet address: <http://www.dist.gov.au/science/gmac/gmachome.htm>

Publications:

- *Guidelines for Small Scale Genetic Manipulation Work (1995)*
- *Guidelines for Large Scale Genetic Manipulation Work (1994)*
- *Guidelines for the Planned Release of Genetically Manipulated Organisms (1996)*

The Australian Quarantine Inspection Service (AQIS)

The Australian Quarantine Inspection Service (AQIS) Information Booklet for Importers, Distributors, Institutions, Laboratories and Other Users of Biologicals for Diagnostic, Analytical and Research Purposes, Canberra: AQIS, 1992.

Animal Welfare Information Center (AWIC)

Agricultural Research Service National Agricultural Library,
5th Floor 10301 Baltimore Boulevard
Beltsville, Maryland 20705-2351

Tel: 301 504 6212

Fax: 301 504 7125

Internet address: AWIC@NALUSDA.GOV

The International Air Transport Association (IATA)

The International Air Transport Association (IATA) Rules Book for the Carriage of Live Animals may be obtained through State Departments of Agriculture or their equivalent, or from IATA, 2000 Peel Street, Montreal, Quebec, H3A 2R4, Canada.

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- ANZCCART News* (quarterly) Australian and New Zealand Council for the Care of Animals in Research and Teaching, c/- PO Box 19, Glen Osmond, South Australia 5064. ISSN 1039-9089.
- Alternatives to Laboratory Animals (ATLA)* Published by Fund for Replacement of Animals in Medical Experiments (FRAME), Russell & Burch House, 96-98 North Sherwood Street, Nottingham NG1 4EE UK. ISSN 0261 1929.
- Australian Animal Technicians Association National Magazine* AATA National Council, c/- PO Box 4025, University of Melbourne VIC. 3052.
- Australian and New Zealand Society for Laboratory Animal Science Newsletter* (quarterly) Editor: Dr L. Ferrara, CMRI, Locked Bag 23, Wentworthville, NSW 2145.
- Australian Primatology Bulletin* of the Australian Primate Society. Editor: Mr G.A. Crook, P.O. Box 500, One Tree Hill, S.A. 5114. ISSN 0817-9573.

Contemporary Topics in Laboratory Animal Science (bi-monthly) American Association for Laboratory Animal Science. 70 Timber Creek Drive, Cordova TN 38018-4233 USA. ISSN 1060-0558.

ILAR Journal (quarterly) Institute of Laboratory Animal Resources. National Research Council, 2101 Constitution Avenue Washington DC 20418 USA. ISSN 0018-9960.

Laboratory Animals (bi-monthly) Journal of the Laboratory Animal Science Association, Publications Subscription Department, Royal Society of Medicine Services Ltd., 1 Wimpole Street, London W1M 8AE UK.

Laboratory Animal Science (bi-monthly) Journal of the American Association of Laboratory Animal Science, 70 Timber Creek Drive, Suite 5, Cordova TN 38018 USA. ISN 0023-6764.

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