CHAPTER 9

ANIMAL HOUSE FACILITIES AND THEIR MANAGEMENT

Introduction

9.1 The standard of care given to animals used in experiments and the standard of facilities in which they are housed have an important bearing not only on the welfare of those animals but also on the scientific data derived from experiments in which the animals are used.

9.2 In the course of this inquiry the Committee paid particular attention to the standard of facilities, training of staff and the quality of animal care. To this end it conducted inspections of a range of animal houses in institutions in which animal experimentation was being conducted.

Animal House Facilities

9.3 The answers to the questionnaire gave the Committee a general picture of the standard of animal house facilities.

9.4 In specialist research institutes, there was reasonable satisfaction by respondents with the standard of facilities. None of the respondents reported any need for more than minor upgrading. Difficulties with maintenance did not feature prominently.

9.5 In research units in hospitals, the standard of facilities varied sharply from institution to institution. Several hospitals reported that major upgrading was necessary. These included the Royal North Shore Hospital, Westmead Hospital and Prince Henry Hospital (Melbourne). The main problems noted by the animal house units attached to the other hospitals were the difficulties in obtaining finance for minor upgrading and routine maintenance.

9.6 A number of universities reported the need for major programmes of building replacement, upgrading of current facilities or substantial expansion of animal house facilities. The need for some of these programmes had initially been identified in reports prepared within the universities up to a decade previously.

9.7 Since 1985 a number of universities have undertaken or announced plans for renovations or, in a few cases, for new facilities. These include: a new sheep house at the University of Tasmania; refurbishment of the Medical School Animal House and the partial barrier unit at the University of Adelaide; a new animal house at the University of Sydney; refurbishment of facilities at the University of Melbourne; new facilities for dogs and other animals and the completion of a specific pathogen free (SPF) rodent production unit at the University of New South Wales.

9.8 Other universities which identified the need for major programmes of renovations were James Cook University, Griffith University, the University of Wollongong and the Australian National University.

9.9 Even in universities where the central facilities were of a high standard, there were often small holding facilities within departments which were far from satisfactory. In one case the animals were housed among the foundations of a building in

conditions that raised concern not only for the welfare of the animals' but also for the staff.[1] At the time of the Committee's inspection of this facility, a new animal house was being built.

9.10 The difficulties experienced in maintaining satisfactory standards of accommodation were common to almost all of the universities. The source of these difficulties lies in a complicated web of institutional and attitudinal factors and is not simply the result of recent financial stringency.

9.11 In a paper delivered to an ANZAAS Conference in 1982 Dr M. Rose stated:

> Far too often animal facilities and personnel are placed at the bottom of a research budget. Even when properly conducted the cost of good animal production is no more than approximately 5-6% of all fiscal expenditure on animal based research programmes. There is a real need particularly in Australia for significant upgrading of animal facilities and for the provision of appropriate training programmes for staff. Part and parcel of this programme is the need to re-educate the scientific community that the animal house is a laboratory and that animal care personnel are a vital part of the scientific research team. Far too often the animal facility and the staff are relegated to positions of least significance in the structural hierarchy of institutions.[2]

9.12 These points were illustrated in a study of animal house facilities at the University of Adelaide during 1985. In the preface to the consultants' report, the Dean of the Faculty of Medicine commented:

> The two factors to emerge from the review of animal services have been the University's failure to recognize the importance of laboratory research animals for the biomedical sciences and the failure to respond to the need to upgrade facilities and staffing to ensure an adequate supply of suitable

> disease-free animals. By comparison if computer facilities within the University were permitted to run down to the same extent as the animal houses with the resultant risk of compromising data, there would be an outcry from the academic community and provision of additional funding would no doubt be approved. The failure to recognize the importance of research animals has meant that requests for additional funding for animal services have been unable to compete with other areas for funding.[3]

The University responded to the report and implemented many of its recommendations.

9.13 The difficulties mentioned in the University of Adelaide report were by no means confined to that institution. Dr Campbell, who gave evidence on behalf of the Australian Society for Medical Research, commented:

> I think this is a problem with medical research funding in Australia. Funds are not specifically allocated for improvement in animal housing facilities or in the employment of well qualified people to look after those animals. I think that with the general downgrading in the level of funding for capital equipment in universities perhaps the university animal houses have suffered even more. I think that a better outcome for animals in medical research will come when it is recognised that special allocation of funding has to be made for that purpose. Research grants or project grants given by the National Health and Medical Research Council are not given on the basis that animals are going to be housed any better.[4]

9.14 There has been some evidence of changes in attitude by institutional managements towards the need for high standards of facilities and care for experimental animals. This is also reflected in the higher priority being accorded to the upgrading of animal houses in a number of institutions.

Standards for Accommodation

9.15 The Code of Practice does not lay down detailed standards for animal care facilities. The guidelines most commonly used by Australian institutions appear to be the Canadian Council on Animal Care Guide to the Care and Use of Experimental Animals the U.S. Department of Health and Human Services, National Institute of Health Guide for the Care and Use of Laboratory Animals and the UFAW Handbook on the Care and Management of Laboratory Animals.

9.16 In its submission ANZFAS recommended that, by statute, provision should be made for legally enforceable national standards of laboratory animal welfare such as:

- housing appropriate to the physiological and ethological needs of the species and strains. This would include, for example, temperature, humidity and lighting specifications, bedding, exercise, social contact, features for the fulfilment of behavioural needs and for designated species unlimited access to outdoor areas. For example, animals suitable for confinement in cages should not be housed in cages which are substandard or too small. Animals' exercise requirements should be met. For example, dogs should at least be provided with an adequate outdoor run and not be kept in cages; and native fauna and primates should be provided with adequate outdoor facilities

- general observation individually of all animals not under experiment at least once every 12 hours

- frequent observation (including nights and weekends) of all animals under experiment or post-operative care by persons competent to alleviate any pain or suffering. The frequency of observation should be stipulated according to the species, the experiment and the severity of the procedure in each case

- pain or suffering relief techniques by species
- methods of euthanasia by species
- the definition of adequate food and water
- the procurement of animals.[5]

9.17 This recommendation raises an important philosophical issue concerning the role of law in encouraging good practice and the development of appropriate attitudes. Put briefly the argument is that detailed prescription is not the most effective way of developing responsible attitudes and facilitating improvement in husbandry practices. Over-emphasis on prescription often leads to an attitude of compliance with the letter of the law rather than its spirit. The development of such an attitude would hardly be beneficial to animal welfare.

9.18 It is often impractical to incorporate detailed standards of care into regulations. In many cases, the care needed is dependent on the nature of the experiments to which the animals are being subjected. However, it is important that general principles of care are included in regulations to provide a recourse by government if institutions do not adhere to standards of practice which have been accepted as a minimum level within the scientific community. These general principles are mainly documented in the Code of Practice but some State Governments may decide to include additional requirements in regulations.

9.19 There is not always unanimity of opinion on the preferred practices in some areas of animal care and handling. Current knowledge in other areas of animal care is deficient. For example, rodents are probably the laboratory animals whose needs have been most studied.[6] Yet it has been pointed out that even for rodents the standards for ventilation and lighting needed to be more specific and relate to cage as well as room conditions:

> ... although for factors such as sound level there is ample evidence that the animal's comfort and well-being can be adversely affected, the information available is inadequate to permit any but the most general recommendations to be made.[7]

9.20 A more recent study, which was conducted for UFAW to determine the size of cage, stocking density and the social group that would make for the well-being and comfort of growing young adult laboratory rats, raised serious doubts about the adequacy of previous guidelines to meet these welfare needs.[8] There is a danger of imposing standards through a legal or quasi-legal mechanism which may subsequently be found to be inadequate or detrimental to animal welfare.

9.21 Because the Committee does not support the recommendation of ANZFAS to incorporate national standards of laboratory animal welfare into legislation, the conclusion should not be drawn that the Committee in any way condones lower standards than those inherent in ANZFAS's recommendation. The Committee believes that a less prescriptive approach will ultimately be more successful in achieving high standards of animal welfare. Under existing laws in some States and in recommendations in this report, there are administrative mechanisms for monitoring standards to ensure that standards are maintained or improved. This approach should meet the desired outcomes better than the prescriptive approach.

Quality Control

9.22 There has been an increasing awareness of the importance of precise biological definition of animals in animal experimentation. In a paper delivered to a seminar at the University of Melbourne in 1987, Dr M. Rose stated:

> The biological definition of animals is arguably the single most important consideration in reducing the numbers of animals used. Animals are complex entities whose biological responses reflect the interaction of their genetic make-up with a multiplicity of environmental variables. It has long been recognised that control, and/or definition of their genetic and health status, and of environmental variables, is an important consideration in the use of animals in research.[9]

In that paper Dr Rose drew together the findings of a large number of scientific studies which reported the effects of environmental variables on animals and the ramifications for research. Some of the variables included light, noise, temperature, humidity, diet, noxious gases (e.g. ammonia) contamination of feeds, type of bedding, chemicals used in cleaning agents and pest control, social interactions with other animals and humans, size of groups, design of pens and so on. Each variable might produce a biological response which could affect experimental data.

9.23 Apart from environmental influences, there are also the effects of infections which, too, can distort experimental data.

According to Lussier and Descoteaux:

> The importance of viral infections as complicating factors of biomedical research is recognized widely.[10]

In their six year study on the prevalence of viruses in 32 Canadian institutions, they concluded:

> ... virus infections of mice and rats are extensive and widespread in Canadian research institutions. Experience has shown that the above mentioned viral infections are good indicators of the standard of husbandry and

> management. The results presented here indicate then that standards have to be revised and that efforts have to be made to improve the quality of the rodents used in biomedical research.[11]

9.24 Apart from the prevalence of viral infections in laboratory animal colonies, genetic contamination of laboratory animals has become a problem in biomedical research and toxicological testing. In some areas of research, specific strains of animals are required because of unique characteristics. In other cases, the inclusion of the name of the strain in the published results of a research project is essential to enable the data to be reproducible. Concern has been expressed that animals obtained from some animal breeding establishments overseas have not been of the right strain. This has resulted in significant losses of money, animals and time.[12]

9.25 Monitoring of health microbiological and genetic status as well as of diet and other environmental factors is essential for both the welfare of the animal and the validity of the experimental results.

9.26 The importance of three basic elements - records, evaluation and surveillance - were emphasised by Dr J. Adams, Director of the Monash University Central Animal House. He stated:

> Quality control occurs at three levels. The first level is indeed at the level of actual records. I will refer the Committee to a publication which is cited and still cited indeed in the NHMRC guidelines entitled Notes for Breeders of Common Laboratory Animals. It was published in 1962 by George Porter and Professor Lane-Petter. In that they talk basically about procedures and what should be occurring. The first topic relates to record keeping and on page 201 they say that proper records shall be kept for the production

> colony management in order, firstly, to determine the efficiency of the operation; secondly, to trace the origin and spread of diseases; and thirdly, to determine biological performance.[13]

9.27 Record keeping is important in providing the health and breeding statistics necessary for both microbiological and genetic monitoring. The ongoing monitoring required to maintain high standard animals is substantial. Dr Adams told the Committee:

> ... if you wish to produce high quality animals and you have a defined status clearly in mind, then you would want to monitor and see whether you have in fact achieved that goal. That involves routinely bleeding animals for viruses - there are 17 or 18 viruses in mice and rats. You would also routinely check them for the common bacterial and parasite-type pathogens that exist in these animals. You would also carry out routine quality control checks using sophisticated scientific procedures for genetic quality control.[14]

9.28 ASLAS has taken an important role in supporting the upgrading of monitoring facilities available in Australia. There is now a National Murine Virus Serology Scheme based in Adelaide which enables production facilities to monitor the health states of SPF stock with screens available for 15 viruses plus mycoplasma.

9.29 ASLAS has drawn attention in recent years to the need for the monitoring of animal feed. Much of the feed comes from feed mills which are mainly concerned with supplying feed to the livestock industries. Feed for laboratory animals is only a sideline and therefore not a high priority for quality control. Representatives of ASLAS gave examples to the Committee of the effects of either toxic or inappropriate materials in the feed supplied to animal houses.[15]

9.30 Apart from the obvious animal welfare problems arising from the use of toxic or poor quality feed, there are more serious ramifications for the results of experiments in which animals are used that have been fed on such feed. Data derived from experiments on these animals may be rendered useless because sensitivity by the animals to the feed may cause a reaction which distorts the data produced.

9.31 Because of the seriousness of the effects of poor quality feed for both the animals and experiments, ASLAS has taken steps to have more monitoring of feed. Dr Kuchel of ASLAS told the Committee:

> So ASLAS took it on board to work with an independent analytical lab to look at diets being fed to laboratory animals throughout Australia, because we recognised that there was a large disparity in reproductive performance. From overseas work we just knew that some of the diets were likely to be substandard.
>
> With the 1987 update, recognising that these are expensive assays, it costs about $750 to assay one diet for 24 analytes. That comes out of the animal house budget. It means that the vet in charge of the facility has to recognise that if you get your diet analysed you do not do something else. However, it is being done and there are 12 institutions in Australia now where money is put aside to analyse the diets. So the researchers can then be given the printout, or given some written verification, that the diet has not changed in the last 12 months. We want to extend this to six-monthly testing because the variation in the quality of constituents within diets may well change with season. So we want to get milling companies to have a fixed formula and to make them realise that their product is being independently checked. By the time we have the system running, by the end of the fourth year I suspect that the enormous variability across Australia, which has been dramatically reduced after the first year anyway, will perhaps be eliminated.[16]

9.32 On animal welfare grounds the Committee regards the development of this monitoring scheme as a significant development. ASLAS is to be congratulated for its initiative in this area.

9.33 The Committee would like to see participation in this monitoring scheme of all institutions involved in laboratory animal experimentation.

9.34 The Committee RECOMMENDS that all institutions which conduct animal experimentation have periodic analyses done on animal feed to ensure that it is of a high and consistent quality, not only to maintain standards of animal welfare but also to guarantee the validity of experimental data.

SPF Animals - Facilities, Breeding and Use in Experimentation

9.35 Increasing sophistication in biomedical research over the past two decades has made experimenters more aware of the range of factors that actually influence the results obtained in research based on animal experimentation. This has led to a increasing demand for animals whose health and genetic status are closely specified.

9.36 Specific Pathogen Free laboratory animals are bred under controlled and closely monitored conditions. Mr Deeny, then Director of the Animal Resources Centre (ARC) in Perth, explained that there are advantages for animal welfare and the validity of data in using such animals:

> The influence of bacteria, viruses and parasites - whether pathogenic or not - may have profound effects on the outcome of experimental results. Therefore, the use of specific pathogen free (SPF) animals is of prime importance in terms of reducing variables and ultimately in minimising the

> numbers of animals used. Organisms such as mycoplasma pulmonis, which continue to be a problem in conventional rat colonies, can cause many misleading results in studies and can also reduce breeding efficiency by 50 per cent, are eliminated in SPF colonies.[17]

9.37 The value of SPF animals was reiterated in evidence given by witnesses appearing on behalf of ASLAS. Questioned about the impact of animal quality on research results Dr Kuchel cited an example from the Institute of Medical and Veterinary Science in Adelaide in which 12 months work was wasted because of a viral infection that got into breeding stock.[18]

9.38 ASLAS provided further detailed evidence to the Committee on the need for the use of SPF animals for experimental purposes. In its view there are very few circumstances in which conventional rather than SPF animals can reliably be used for research purposes.[19]

9.39 Prior to the recent opening of the SPF facility at Little Bay in Sydney the major SPF breeding unit in Australia was the Animal Resources Centre in Perth. It was set up as a statutory authority and financed jointly by the Western Australian Government, the University of Western Australia, Murdoch University and Curtin University (formerly the Western Australian Institute of Technology).

9.40 There is an SPF unit at the Walter and Eliza Hall Research Institute in Melbourne but its output of animals is mostly, if not solely, for use within the Institute.

9.41 Animals produced in an SPF facility are more expensive than conventionally bred animals. However, even with substantial freight costs added to the basic purchase price, 47 per cent of the ARC's income from sales was derived from sales to the eastern States in 1985.

9.42 The scientific and welfare value of SPF breeding operations are not a matter of dispute. Assessment by ethics committees must deal with the adequacy of the proposed animal model in experimental proposals in the light of the type of issues raised by ASLAS. Such assessment should also be an integral part of the evaluation of proposed projects by funding bodies.

9.43 SPF units are capital intensive to construct and are more expensive to run compared with animal houses. The establishment of additional SPF units would require a rationalisation of breeding of experimental animals, particularly rodents, among institutions within the region in which new SPF units were established to ensure the economic viability of those units.

9.44 Mr A. Deeny, then Director of the ARC in Perth, doubted whether Australia has the capacity to support another SPF unit like the ARC, particularly in view of his sales to the eastern States.[20]

9.45 The University of New South Wales has recently commissioned an SPF unit devoted to rodent production at Little Bay in Sydney. In discussing the potential market for SPF animals Professor Ronayne commented:

> I did take the decision to go ahead based upon a new survey of user needs, the closing down of the facility at the Australian Nuclear Science and Technology Organisation and the possible closing down of the facilities at Sydney University in Castle Hill. The market for SPF rodents therefore seemed much rosier. I took the decision to go ahead with the SPF unit and I think the capacity of the unit at this time, which is 60,000 SPF rodents, will be fully committed within a year of its beginning operations ...[21]

9.46 Responses to the questionnaire concerning the advantages of breeding within an institution as opposed to obtaining animals from an outside supplier evoked such a wide diversity of opinions that it was not possible to derive a consensus view.

9.47 There were also marked differences in figures provided to the Committee on the relative costs of internal breeding compared with purchase from a specialist supplier. The differences in costs per animal for internal production of a common species quoted by various institutions may be explained by differences in cost allocation by institutions, in particular, whether caging was included as a recurrent cost; differences in the scale of production; differences in design of facilities and in the age and design of equipment; and differences in the efficiency of the management and staff of the facilities.

9.48 Many institutions at the time of completing the questionnaire were not able to supply the Committee with accurate figures on the relative costs of in-house breeding compared with outside purchase.

9.49 Only seven of the universities had policies that required researchers to pay for animals and in five of these cases the policy did not apply to all breeding units within the university. In the course of hearings the University of Adelaide indicated its intention to require payment for animals.

9.50 The Central Animal Breeding House at the University of Queensland, which does charge for animals issued, reported in its Annual Report for 1986 that its subsidy per animal issued for that year was $5.67. University policy is that the subsidy on laboratory animal breeding should be eliminated or substantially reduced over the next five years.[22]

9.51 Monash University has a two-tiered pricing policy. The price of animals for experimenters within the University includes all recurrent costs but excludes any element attributable to staffing costs. External purchases are charged at a rate which covers the full cost of staff and administration as allocated to the specific species.

9.52 The case for charging experimenters for animals supplied for experimental purposes rests on three grounds. First, payment by the researcher for animals encourages careful planning of experiments and seems likely to minimise the number of animals used. Secondly, if the animal house does not recover costs there is little encouragement to identify costs and enable assessment of the cost effectiveness of production. Staff cannot be held accountable for their performance. Thirdly, once charging is accepted, proper pricing can enable animal houses to accumulate financial surpluses which can be used for capital investment in animal house facilities. Such investment has the potential to increase the efficiency of animal production. Conversely, low pricing of animals will make the animal house dependent on university funding which in the past has not been enough to maintain many animal houses at a high standard.

Rationalisation of Breeding Units

9.53 Except in Perth where the ARC provides institutions with most of their animals for use in experiments, animal breeding and supply is decentralised in Australia. Most institutions carry out some animal breeding programmes for their own use. A few central animal houses in the larger institutions also supply animals to other institutions.

9.54 The question was raised in the inquiry whether the current decentralised breeding system should be continued or whether there should be a rationalisation of breeding

establishments on a regional basis. In essence, it is a question of whether to have a limited number of large animal houses or to have, as there is now, mainly relatively small ones.

9.55 Larger animal houses can achieve economies of scale for many species which will reduce the cost of animals for experimenters. There should also be less wastage from large orders for animals of the same sex because the discarded animals of the other sex may be used in other projects where a particular sex may not be an important factor. The large and more constant throughput of animals gives managers of animal houses more flexibility to operate in an efficient way. Dr J. Adams, Director of the Central Animal House at Monash University, explained:

> ... the operation of small units always has the problem of economy of scale, particularly where there is fluctuation in demand. The university finds in this industry that research workers vary their orders. There are very legitimate reasons why they do that. The logical thing is that, if you want to minimise wastage or the problem of famine and feast in terms of supply, it is better to centralise and go for better economy of scale.[23]

9.56 Dr Adams also told the Committee:

> ... the more sophisticated your product quality control, the greater input you will make to the preparation of your materials or the maintenance of your general environment. So more sophisticated places may have greater staff input. On the other hand, more sophisticated places, particularly bigger ones with better economy of scale, are better suited to the uses of automated pieces of equipment. Particularly if they have been purpose-designed buildings, you will have a better flow of materials and better dynamics of operation, which tend to make the carrying out of those basic tasks more efficient. So sophistication of quality control increases work and the sophistication of man management, building design and the dynamics of operations can reduce the staff input per animal produced.[24]

9.57 By centralising breeding establishments, scarce capital funds can be concentrated on providing high quality facilities with sophisticated equipment rather than being dispersed among many animal houses with a lesser standard of facilities and equipment. This not only improves the quality of animals bred in these establishments but also it improves the environment for the animals and thus enhances animal welfare. It is essential to have high quality animals in many projects to obtain accurate and reproducible data.

9.58 A large animal house has a hierarchical staff structure which affords staff better career prospects and opportunities for training. The greater diversity of species and procedures in a large animal house gives a broader and more interesting range of duties for staff to perform. Technicians will also have more opportunities to develop more specialised skills. The larger animal houses can employ one or two professional staff who can raise standards of care and develop specialised practices and procedures. With professional direction and advanced technology, the animal house will begin to achieve its rightful status for the important and integral role it plays in the research activities of the institution.

9.59 It was argued in the course of the inquiry that by centralising breeding within a region, the extra handling and transportation of animals from the breeding establishment to the institution would cause additional stress to the animals. However, many SPF and other animals are currently transported both within a city and interstate without undue problems. The Western Australian institutions also had no criticism of the centralised system operating in that State. Provided that the animals are given time to recover from transportation and to familiarise themselves with their new environment, the Committee does not believe that the need for transportation negates the advantages of centralisation of breeding.

9.60 At present scarce funds are thinly distributed over many animal houses, although in the last few years there has been an injection of more substantial amounts into a number of animal houses, including at least $3.8 million being spent on the new SPF unit at the University of New South Wales.[25] There still remains a number of animal houses with poor facilities or equipment. From a national perspective, this is not a desirable situation.

9.61 The Committee has already outlined reasons for contracting the number of breeding units to make the scarce funds more cost effective and to enhance animal quality and animal welfare. This contraction is probably inevitable but the Committee believes a planned contraction would serve the scientific community better. It is also essential that the large animal breeding units which emerge are managed by highly professional and experienced veterinarians with training in laboratory animal science.

9.62 There is probably room for no more than four or five large breeding units, with ARC in Perth used as a model. As each unit would serve many institutions, it would be preferable for each to be run independently of the institution in which it is located. The Committee does not have a strong view on whether the large breeding units should be run as commercial or non-profit operations. Non-profit in these terms means that surplus funds are not distributed to shareholders and not that the accumulation of surplus funds should be avoided. In fact, surplus funds would be necessary to develop and maintain the units. Whether run as a commercial enterprise or not, the key element is efficient management and operation.

9.63 Mr Deeny drew attention to the production of little used strains:

> ... we would probably advise the institution that it would be in their best interests to supply it themselves because the costs would be inordinately high if we bred them. What we are trying to do, however - we have started on this process now - is to institute a cryo preservation system within our own facility so that we can freeze mouse embryos, and also in the future rat embryos, of little used strains so that we can actually keep the animals in Western Australia without the expense of having to breed them and to maintain them.[26]

9.64 The other exception is where the breeding is an integral part of the experiment itself. The Department of Genetics at Adelaide University has been engaged in the establishment and breeding of a species of small marsupial mouse. The close attention by staff who are engaged in the experiment enabled results to be achieved which would not be possible in a large-scale operation.[27]

Cost Recovery

9.65 The Committee took evidence from a number of institutions on the question of whether to charge experimenters with the cost of animals or whether to subsidise either fully or partially the supply of animals for experiments. Most institutions have subsidised animals to some extent but there is a trend now towards greater cost recovery. A number of institutions now require experimenters to pay for the animals either bred or purchased on their behalf from the grant received for the project.

9.66 Cost recovery makes experimenters more conscious of the cost of animals and encourages them to consider more carefully the number of animals needed to complete the project. If animals are free, experimenters tend to order more animals than they

need. There is no incentive for the prudent use of animals. Hence, there has been considerable wastage of animals over and above normal and inevitable surpluses occurring to meet special requirements, especially in response to orders for a large number of animals of the one sex.

9.67 Cost recovery programmes recover operational costs, some of which include staff costs, but not the cost of depreciation of buildings and major equipment. Some institutions have a two-tier programme where external orders are charged a premium. This additional revenue is then used to upgrade equipment and other facilities within the animal house.

9.68 Cost recovery insulates animal houses from the vicissitudes of institutional funding, particularly in many institutions which have given animal houses a low priority in the allocation of funds. With increasing contraction of funds in the tertiary sector, an assured income through cost recovery will enable animal houses at least to maintain, if not increase, standards.

9.69 The Committee RECOMMENDS that animal house supply and breeding units develop appropriate pricing policies to enable recovery of all recurrent costs including caging and minor equipment and that surpluses generated should be used to develop animal house facilities.

Surplus Animals

9.70 From answers to the questionnaire and from evidence received by the Committee, it was revealed that many institutions produce large numbers of surplus animals. This practice has developed mainly because some experimenters over-order animals or order large numbers of animals narrowly defined for sex, weight and age, resulting in considerable wastage of animals that did not meet their requirements.

9.71 Much of the over-ordering by experimenters has occurred because the animals have been supplied free of charge. There has been, therefore, no incentive in those institutions for experimenters to calculate the minimum number of animals needed for an experiment or series of experiments.

9.72 It was pointed out to the Committee that it is often difficult for an experimenter to predict accurately the number of animals needed for a project. Sometimes, the design of each experiment in a project is dependent on analysis of data derived from the previous one. The number of animals needed for subsequent experiments in these circumstances can often be only an estimate. Experimenters will almost inevitably tend to order more rather than fewer animals to ensure that enough animals are available at the required time. The Committee accepts that it is not always possible to calculate accurately the number of animals needed for a research project. There have to be tolerances within the system to cater for the unknown and the unexpected, particularly when research is often going beyond the bounds of current knowledge. However, some experimenters have not been as assiduous as they should have been in estimating animal requirements.

9.73 Another factor causing uncertainty in animal requirements is the dependence of many experimenters on annual grants. As Monash University pointed out:

> 1. Research staff don't know whether grant applications have been successful or not.
>
> 2. Biological facts require breeding to commence six weeks to eighteen months in advance of planned use of animals.
>
> 3. Most research work is dependent on post-graduate students, many of whom have some difficulty in establishing techniques.[28]

9.74 The narrow definition of animals, as mentioned above, is a major cause of over-production. Usually animals of the same sex are required and if there are no orders for the opposite sex, or for either sex, of the same species, surplus animals will be produced. According to the ARC:

> Australian animal users purchase predominantly female mice. This creates a surplus of male mice that are culled. In order to attract additional sales of male mice, incentives, such as discounted prices, have been introduced. While females are still the sex predominantly used, these measures have had a small influence on the numbers of males used.[29]

9.75 The Committee noted that this predominance was not universal within Australia as some institutions reported a bias for male mice.[30]

9.76 Mr Deeny, the then Director of the ARC, told the Committee that his experience in the United Kingdom was the opposite to that of Australia as experimenters there tended to use male mice.

9.77 It appears from the evidence that some experimenters both in Australia and overseas are unaware that for some types of experiments, either sex is suitable. In order to avoid wastage of animals, animal houses need to be given as much flexibility as possible in the supply of animals of a sex which will be produced anyway to meet specific requirements. There is obviously a need to educate experimenters about the suitability of the use of animals of either sex in particular types of experiments. In the first instance, this should be done by professional staff employed in animal houses. However, given the cost of breeding, maintaining and disposing of surplus animals, a more concerted effort should be made within the scientific community to keep

surplus animals to a minimum. The Committee believes that ACCART should arrange for studies to be done to determine whether one or either sex is appropriate to use for particular types of experiments.

9.78 The ARC told the Committee in its submission that it provides incentives, such as discounts, in order to secure orders for animals which have to be produced to meet specific requirements.[31] The Committee understands that the Central Animal House at Monash University employs a person to handle external sales and is only involved in the marketing side of the Animal House's operations. If there were fewer animal houses, it would facilitate closer co-operation among them to avoid over-production.

9.79 A statement issued by the New York Academy of Sciences on the Animal Model Selection was critical of an imbalance between sexes in the planning of experiments.

> In planning animal procedures, consideration should be given to equal use of females and males. At present, much research is conducted on male animals; their female littermates, not used for breeding, frequently are disposed of. Results of studies using only males have often been assumed to apply to females as well, sometimes without justification. The appropriate use of both male and female animals may increase the validity of data and decrease animal wastage.[32]

9.80 The Committee RECOMMENDS that a study be undertaken by ACCART to determine the most effective means for production planning of laboratory animals in terms of minimising excess production.

Standard Operating Procedures

9.81 Few institutions were able to supply the Committee with a copy of the standard operating procedures governing animal care within the breeding and holding units. In most cases procedures did exist but were not written down. Staff were either expected to know what needed to be done or to respond to oral instructions.

9.82 Without written standard operating procedures, there is a greater likelihood of mistakes being made, particularly with new staff. Mistakes can have ramifications beyond animal welfare. A project can be put at risk because the wrong husbandry procedure was performed. With greater emphasis being placed on the definition of the animal in results of projects published in scientific journals, accuracy is essential.

9.83 Each animal house or holding area should have written standard operating procedures, which are revised when new information becomes available to update procedures and practices performed there. Writing of a procedural manual is time consuming. The institution should ensure, however, that a shortage of staff does not prevent the task being done.

9.84 Institutions licensed in New South Wales will be required by law to document standard operating procedures for accreditation.