

THE PRODUCTION AND DISPOSITION OF LABORATORY RODENTS SURPLUS TO THE REQUIREMENTS FOR SCIENTIFIC PROCEDURES

A REPORT OF A LASA TASK FORCE MEETING HELD ON 12TH JUNE 1998

SUMMARY

The main finding was that the LASA survey of laboratory animal breeding establishments did not reflect or support the data from the Defence Evaluation Research Agency that up to three times as many rodents were culled as surplus to requirements than were used in scientific procedures. A major finding was that there is a marked requirement by users for an unequal number of male and female animals. This generates an inevitable "biological" surplus, to which must be added a "managed" surplus arising out of variable management practices and user requirements, which are identified within this document. The data suggests that in general, up to half the number of animals bred for scientific procedures become surplus to requirements. A large number of these surplus animals are used to supply organs and tissues for research while a significant proportion is provided as carcasses to zoos, wildlife parks and similar outlets. A number of recommendations are made for minimising the surplus generated.

INTRODUCTION

During the early part of 1998, information presented to Parliament on figures released by the Defence Evaluation Research Agency at Porton Down, showed that in 1994-95 up to three times as many laboratory rodents were culled as "surplus to requirements" than were used in scientific procedures at that Centre. This led subsequently to a number of Parliamentary Questions on the real extent of this surplus nationally, and on its justification. Mr. George Howarth, Under-Secretary of State at the Home Office stated that the issue of overbreeding of animals would form part of the Animal Procedures Committee's review of the operation of the Animals (Scientific Procedures) Act 1986, which would be published later in the year (now published – Report of the Animal Procedures Committee for 1997). At the same time, media reports presented claims by the animal rights groups that there

was a "horrendous wastage" of millions of dogs, cats, monkeys, rabbits, mice and rats and that the Government admitted that three times as many rodents were probably bred and killed as were used.

With encouragement from the Home Office, together with LASA Council's belief that this issue had not been effectively addressed before, LASA Council decided to set-up a Task Force under the Chairmanship of Dr. Bryan Waynforth with the following aims:

1. To define the issues.
2. To determine the extent of surplus.
3. To show why the surplus occurs.
4. To provide recommendations for minimising the surplus.

The Task Force consisted of representatives from academia, industry and the Laboratory Animals Breeders Association (LABA). Also present was a member of the Home Office Inspectorate, attending as an observer.

DEFINING THE ISSUES

The results were initially collated under the headings: Scientific, Commercial and Management/Welfare. However, as there was considerable duplication, a single list was produced of those areas which give rise to a surplus. It was considered that animals surplus to scientific requirements may arise, to varying degrees, because of the following:

1. Breeding pressures
 - a) Inability to match supply with demand.
 - b) Trying to meet a variable customer demand and short notice orders by breeding animals to supply requirements over a wide range of bodyweights and by maintaining a large number of strains.
2. Body weight/age requirement

Requirements may be for a narrow range of body weight or age and therefore animals outside this are more likely to become surplus. Additionally, because animals are growing continuously, they can soon become too heavy or too old to use.
- 3.. Sex preference

A major trend is to use one sex in preference to both equally. The remainder of the lesser used sex of animal therefore becomes surplus.

4. Poor Health Status
If animals harbouring potential pathogens are produced, there is a chance these may become clinically ill and have to be euthanased. A large surplus is also produced if animals have to be rederived because they carry unwanted pathogens.
5. Time-mating
Because this is not an exact procedure, more animals than required may be produced in order to ensure that the demand for foetuses and neonates is met. Additionally, a study may be cancelled or delayed during the time between mating and the start of the study. Time-mated animals are rarely of interest to other users.
6. Part-use of litter
There may be selective use of a litter, perhaps as neonates, leaving some or even the majority of animals unused.
7. Cancellation of studies
Only some of the animals ordered for a study may be used because of a change in the protocol, the rest being returned to stock. Animals may then not be suitable to be used in other studies, become too old or heavy to be used, or there may be no adequate management system in place to reallocate suitable animals to a future study.
8. Genetics of breeding
 - a) a proportion of the animals may be produced without the genetic constitution required (e.g. breeding genetically modified animals such as transgenics and other animals in special breeding programmes).
 - b) some animals, particularly when breeding special strains, may be of inappropriate genotype or quality (e.g. weak, malformed, runt).
9. Single sex aggression
In most mouse strains, the male can be highly aggressive and therefore difficult to use or to house in groups, which is generally preferred for welfare reasons. This results in preference for female animals.
10. Historical database
In some cases, users may insist that animals on which there is no acceptable background data (e.g. physiology, behaviour etc.,) cannot be substituted for animals which do have these data. They may also have a prejudice for a particular strain of animal, which may be in short supply, when a similar strain may be suitable but is avoided, such as use of the C57BL/10 strain

instead of the C57BL/6 strain. This may lead to inefficient use of the various colonies of animals that are available.

11. Duplication of animal colonies
Duplication of animal species and strains within a multi-facility establishment without rationalisation or collaboration on how their use can be shared has the potential for leading to considerable surplus.
12. Seasonal demands/fluctuating study demands
Low demand from customers, especially during the major holiday periods of August and December, or inconsistent and unpredictable demands. This results in considerable surplus because breeding cannot effectively be switched on and off to cope with these events.
13. Ineffective communication and management practices
 - a) failure to communicate clearly requirements or altered circumstances to the supplier.
 - b) failure to inform users internally of status or altered circumstances regarding animal breeding and use.
 - c) failure to manage effectively animal production and use to achieve minimal surplus, including colonies allowed to be maintained at the minimum viable level without an immediate or foreseeable use, and a reticence to apply newer technologies such as cryopreservation.
14. Spare animals
Lack of proper understanding and communication of requirements for spare or extra animals which are to be supplied with the order. This may lead to the unrequested addition of such animals to an order. Lack of effective or unrealistic ordering procedures will also result in surplus animal production.
15. Lack of cost efficiency
Lack of focus on the potential that properly applied cost accounting could contribute to restricting over-production and over-ordering of animals, by making users aware of the costs to their budget.
16. In-house vs commercial production
Where in-house breeding is associated with excessive surplus, commercial purchase should be considered. This may apply to little-used small breeding colonies of common strains, where purchase of an establishment's requirements from commercial sources may relieve some of the surplus production at the latter while eliminating surplus production at the user establishment.

Conclusion

Those categories in which the greatest surplus is likely to be produced were considered by the Task Force to be the following:

Breeding pressures

Seasonal/fluctuating demands

Gender preference

Age/bodyweight preference

Duplication of animal colonies within multicentric establishments.

Ineffective communication, planning and management.

GENERATION OF SURPLUS ANIMALS

Members of the Task Force outlined the breeding (and use where appropriate) of animals within their establishment. This provided the background for the development of tables (Appendix), which each was asked to fill in, covering the breeding, issue and purchase of inbred and outbred rats and mice and genetically modified mice.

For any annual total production of a particular stock or strain of animal, given that it is a biological fact that approximately equal numbers of male and female animals will be produced, the following data were supplied:

the number of males issued for use in procedures as a percentage of the total number of male animals bred;

the number of females issued for use in procedures as a percentage of the total number of female animals bred.

The percentage of surplus male and female animals generated for any given colony was then derived.

It was clear from the data presented that there was a marked trend in sex preference in orders supplied by users for both rats and mice. In rats, the preferred sex for use was male and conversely, for mice, it was female. The possible reasons for these sex preferences are considered elsewhere in this report. However, the important point to note is that the procurement for use of unequal numbers of each sex leads to an unavoidable surplus of animals and is exemplified below.

Data provided by individual Task Force members were, overall, similar and consistent for given inbred and outbred strains and stocks; there was a small deviation either side of the percentage quoted. Therefore, the data for inbred and outbred animals were combined.

RATS (inbred and outbred)

The pooled data supplied indicates that approximately 68% of all male animals bred and 32% of all female animals bred are issued for use in scientific procedures. Therefore, it follows that approximately 32% of all male animals and 68% of female animals become surplus to in-vivo requirements. This can be explained as follows: Taking a nominal production of 200 animals (100 male and 100 female) as an example, it can be deduced that if 68 (%) of the males were needed as a minimum then 32 males and therefore a compliment of 32 females would have been generated as "managed" surplus in order to ensure the supply criteria of lead time, animal specification etc. (see later). The additional (remaining) female surplus of 36 animals would have been produced as a result of the sex bias preference of orders. This breakdown of use/surplus is presented in a template form (Diagram 1). For the purpose of this discussion, the surplus which is produced directly as a result

of the sex preference is loosely termed the "biological" surplus because it is generated as a biological certainty every time there is an order for unequal numbers of either sex.

An alternative way to visualise this inevitable surplus is to imagine that it is theoretically possible to breed exactly the number of animals required, in our case, say 68 male animals. By definition, it will be necessary to also breed 68 females even though a use can be found for only 32 of these animals, thereby resulting in a "biological" surplus of 36 animals. As has been described, the additional surplus (32 males and 32 females) results from management factors within the breeders' establishment which are built-in to account for those criteria such as lead time from order to supply, age/weight specification etc. as discussed in the initial section on Defining the Issues. This has been termed "managed" surplus.

Diagram 1 – Rat use and surplus

Γ	Animals supplied to user: 68%		Managed surplus: 32%
E	Animals supplied to user: 32%	Biological Surplus: 36%	Managed surplus: 32%

MICE (inbred and outbred)

The same model when applied to the mouse data gave the following: 35% of all male mice bred and 65% of all female mice bred are issued for use in scientific procedures. The overall use/surplus distribution for mice is shown in Diagram 2.

Diagram 2 – Mouse use and surplus

Γ	Animals supplied to user: 35%	Biological surplus: 30%	Managed surplus: 35%
E	Animals supplied to user: 65%		Managed surplus: 35%

Diagram 3 shows the information for genetically modified mice where 46% of all male animals bred and 54% of female animals bred are issued for use.

Diagram 3 – Use and surplus for genetically modified mice

Γ	Animals supplied to users: 46%	Biol. surplus: 8%	Managed surplus: 46%
E	Animals supplied to users: 54%		Managed surplus: 46%

DATA FOR PURCHASED RATS AND MICE

These data were only available from three of the Academic establishments. Although there was a wide variation, the general trend indicated that the surplus arising from animals being purchased for studies and then not being used, was very small.

OTHER INFORMATION

Task Force members provided information in the following tables (see Appendix) on the average time to supply an order, how surplus was disposed, whether surplus was discussed formally within the establishment and brief reasons for why the surplus arose:

Lead time

The most frequent period of notice (lead-time) given to the supplier for ordering animals (in-house or external source) was 1-2 weeks. However, standing orders and longer periods of notice, up to 4-8 weeks were also given, the latter often when ordering animals from genetically modified mouse breeding colonies. Many short notice orders of less than 1 week were also encountered.

Disposal of surplus

It was evident from the data presented that a significant proportion of those animals purchased for regulated scientific procedures but not used for that purpose, were in fact used to collect tissues and organs for ex vivo studies after Schedule 1 euthanasia. Beyond this, surplus animals were disposed of mainly as Clinical

Waste¹ by the academic establishments. In contrast the industrial and particularly the commercial establishments (LABA) sent the majority of their dead surplus animals to provide food for zoos, wildlife parks and similar outlets. Interestingly, this use represents animals which, had they not been available from designated animal breeders, would have been specifically bred for this purpose and, in all probability, under less regulated conditions.

Is surplus discussed formally within the establishment?

In academia, the generation, accumulation and disposition of surplus animals were rarely matters for formal discussion in a forum such as an established committee. In contrast the control of surplus was handled formally in the majority of the industrial establishments and by all the commercial breeders.

Reasons given for why surplus is generated

A large variety of reasons were given in the tables for why the surplus occurred within each strain or colony of rats and mice for which data was provided. These will not be described here as for the most part they reproduced the information detailed in the section on Defining The Issues.

¹ Waste which consists of animal tissue, under these conditions, is defined as clinical waste under the Controlled Waste Regulations 1992.

DISCUSSION

The wide variety of reasons identified by the Task Force for why animals produced become surplus to requirements, leads to the conclusion that the production of some surplus is inevitable. It is also evident that there are two extremes. At one end, surplus is generated which cannot be eliminated by any means, such as occurs during the breeding of genetically modified animals, since the breeding of these animals is for the purpose of propagating a modification to their normal genetic constitution (e.g. transgenic animals, nude mice). In many cases the scientific procedures for producing these modifications, such as transgenesis, are currently imprecise and many offspring are produced which do not carry the genetic change required. These animals are of no scientific value and are euthanased. At the other end are ineffective management practices, often concomitant with a personal attitude such as "we must always have animals when we need them", which guarantee that a surplus will be generated. However, such surplus can be managed appropriately by improved practices and could be considerably reduced.

The data supplied by the Task Force members suggest that up to about half of all animals bred become surplus to requirements. Put in another way, in order to satisfy current scientific requirements, twice as many animals are bred than are actually required. This is considerably less than some previous estimates (see Introduction) but nevertheless represents a large number of animals. It begs the question as to whether a reduction of this surplus can be made and if so, by how much? A maximum surplus of 10% as a figure to aim for, as suggested in the Report of the Rodent Refinement Working Party on "Refining Rodent Husbandry: the mouse" (Laboratory Animals (1998) 32, 233-259) is impractical. However, it is reasonable to expect that some reduction can be made by utilising better practices. One example is to consider the supply of animals obtained from commercial breeders. Their surplus would be expected to be the lowest achievable in the circumstances, because they have a good reason to keep surplus to a minimum, which is profitability. Commercial breeders depend heavily on previous trends to forecast future animal requirements. Intelligence on current scientific requirements is provided by communication with their customers and depends on how well customers interact with them. Commercial breeders must respond fully to customer demands and market forces if they are to remain viable. Since demands for animals can be highly variable, a full range of animals must be available which, with the impossibility of accurately forecasting precise customer requirements, will lead to overstocking and subsequently to the generation of surplus. However, it is evident that improving supplier customer interaction will impact positively in reducing surplus. These events also occur in user breeding establishments and the same recommendations can therefore be made.

A striking fact which emerges from the data is the unbalanced nature in the use of male and female animals, which gives rise to the "biological" surplus shown in Diagrams 1 & 2. Procedures which require equal numbers of male and female animals lead to zero "biological" surplus. The best examples of such studies are to be found in toxicology investigations where apart from reproduction and fertility studies, equal sex groups are normally used. In addition to sex preference, Task Force members stated that there was also a marked preference by users for a relatively narrow range of body weight and age. Narrow specification by users, including sex preference, is thus considered to be a major contributor to the extent of the overall surplus produced. Although there was no clear sex preference for genetically modified mice (Diagram 3), the data were not homogeneous, being derived not only from supply to users, but to a large degree from the need to develop variable numbers and types of breeding lines using different breeding paradigms (homozygous, heterozygous). Further data would be required to clarify this situation.

Although a search of the literature shows that in some cases there may be good reasons for preferring one sex over another, (eg. oestrous cycles interfering with biological responses, or the difficulty of group housing males of many mouse strains due to aggression, which leads to preferential use of females.), or for preferring a narrow specification for age and bodyweight, it has also been suggested that some of this is historical and unsubstantiated. In many instances, users faced with a delay because of a shortage of the animals of their choice, are prepared to accept animals outside their normal specifications. This suggests that with the proper application of good experimental design and statistical analysis, some of the imbalance in specification (for example as embodied in the "biological" surplus) might be obviated and thus the surplus reduced. This approach does not appear to have been reported in the literature and could perhaps be exploited?

Improving management practices, primarily at user establishments, has already been alluded to as a significant determinant for reducing the level of surplus. There are a number of ways this can be achieved and are related to reducing the "managed" surplus (Diagrams 1-3). A commitment is needed by customers to communicate their long term requirements to breeders, both in-house and externally, to enable breeders to fine-tune their breeding programmes. An important component of this is the amount of notice, or lead time, that is given to breeders to supply an order. It is often not appreciated for example, that to produce a mouse of 8 weeks of age takes about 12 weeks; forward planning will minimise any surplus, provided both sexes are used. Generally, breeders are given a lead time of only 1-2 weeks, occasionally longer but often shorter (short notice orders) and these can be filled only by maintaining a stock of a sufficient number and variety of animals to satisfy customer choice. This leads inevitably to a large surplus. Better communication and planning by customers, eg. by providing

breeders with a standing order (preferred), or with considerably more notice of their requirements would go a long way to reducing this surplus. Another area for consideration is improving management in establishments which have several independently managed animal facilities. Centralising control and insisting on collaboration between these multicentric units is essential to minimise unnecessary duplication of animal colonies and to minimise surplus.

Many user establishments breed small colonies of the common strains of rodents, such as Wistar, Sprague Dawley and Lister Hooded rats and C57BL/6 and BALB/C mice. The reasons are often historical and not scientific. Stopping this practice and obtaining these animals from commercial breeders will eliminate the associated surplus at the user establishment and could reduce the surplus at the commercial breeders provided better use is made of their spare capacity and extra surplus is not generated. In some cases customers have small unique colonies of animals which are infrequently used and may be kept at minimum viable levels, "just in case" some use might emerge. There is anecdotal evidence where owners of such small colonies are not kept informed or may even be unaware of the status of these colonies which are thus continually producing small numbers of animals with no assigned use. The generation of surplus from these could be addressed by reducing colony size to a minimum or by using new technologies such as cryopreservation.

The duplication of rodent strains, both normal and genetically modified, across establishments as well as within establishments, is apparently widespread. Collaboration amongst these groups would allow better use of resources and contribute to minimising surplus. A strategy such as a central register of strains maintained at each establishment, together with availability and a willingness to share animals and management expertise could provide a way forward in these circumstances.

CONCLUSIONS

The production of a living organism which has no assigned use is undesirable. It is ethically unsound and is an inappropriate use of resources leading to unnecessary cost. However, this must be balanced against the genuine need to continue medical and biological research for both human and animal benefit. The only reasonable way forward is to ensure that the benefit of breeding, maintaining and using animals outweighs the cost. The production of animals surplus to scientific requirements must be justified within the circumstances in which it arises. For example, arbitrarily reducing the availability of animals from commercial suppliers and thus their surplus from overbreeding, would mean having to significantly increase the lead time for ordering animals. This would delay the conduct of research by the user and thus the potential benefits – for example the production of a medicine. The acceptability or otherwise of these consequences is a matter for cost : benefit analysis. Of course one aspect of this analysis might be to require better planning to compensate for the increased lead time! Cost : benefit analysis would be simplified and ethical discussion aided if guidelines were available on those best practices identified for the breeding, supply, maintenance and use of laboratory rats and mice and these would help minimise the surplus (see below). In addition, the use of the template and process as shown in Diagrams 1-3 might be useful in determining the extent and type of the surplus which requires cost : benefit consideration. However, it should not be forgotten that animals which do become surplus to requirements are at all times maintained under good conditions of husbandry, with consideration given to their comfort and welfare so that this cost is minimised. When it is necessary, they are always euthanased humanely. The point is also made in the section ‘Generation of Surplus Animals’ that a significant proportion of animals bred for but not used in regulated procedures are in fact used for collection of tissues and other purposes and therefore do not remain a surplus.

APPROACHES TO MINIMISING THE PRODUCTION OF SURPLUS LABORATORY RATS AND MICE

1. Introduce a procedure to review the surplus generated which requires, but is not limited to, the application of those approaches to minimising the generation of surplus as described in 2-16 below. It is recommended strongly that this should come under the umbrella of the Ethical Review Process which is mandated for every establishment designated under the Animals (Scientific Procedures) Act 1986 and has oversight by the Home Office Inspectorate.
2. Develop and communicate widely an establishment policy on how the generation of surplus will be controlled and minimised.

3. Formal education of users on the reasons for why and how surplus is produced and the operation of best practices to minimise production of such surplus. This could be partially achieved by specific inclusion in the Home Office Modules 1 and 5 training courses.
4. Keep accurate records of the surplus produced and the reasons and justification for this, leading to better colony management. This could form the basis for the review mentioned in 1 above.
5. Better communication with commercial breeders and suppliers as to the long term projected requirements of users.
6. Efficient and regular communication in-house between the user and animal facility staff so that the user is better aware of the status of breeding colonies and the availability of animals and resources.
7. Planning scientific procedures to ensure that sufficient lead time is given to breed animals for specific requirements, including the provision of standing orders.
8. Centralising control of multi-site animal facilities within an establishment so as to reduce or eliminate duplication of animal strains and minimise the generation of surplus.
9. Requiring users to apply proper experimental design and statistics and to justify narrow specification of sex, age and bodyweight of the animals required and short lead times for orders.
10. Refrain from breeding small colonies of common strains and special strains of rats and mice which are easily available from commercial sources and where the level of commercial surplus is not increased, unless scientifically justified.
11. Investigate the use of cryopreservation and other procedures to prevent the unnecessary maintenance of colonies with infrequent use.
12. Offer animals for use in studies by other colleagues as soon as they become surplus to requirements, thus avoiding the necessity for ordering more animals.
13. Introduce a system of full cost recovery from the user, where appropriate, so to instil a responsible attitude towards the generation of surplus.
14. The development of a national register of rat and mouse strains maintained at each establishment, together with their availability and scientific justification. This should be under the jurisdiction of the Home Office or an independent body.
15. Investigate and, if possible, collaborate with other establishments which are maintaining the same strain of animal so as to avoid unnecessary duplication of breeding and supply.
16. Investigate ways to use spare animals to fill genuine scientific needs, such as the collection of tissues and organs, which reduce the need to order animals specifically for this purpose.

OUTBRED BREEDING COLONIES

SPECIES: RAT/MOUSE (delete one)

Data Period

Strain

1

2

3

4

5

Strain name (optional)					
No. ♂ issued (or %) ^{1.}					
No. ♀ issued (or %) ^{1.}					
♂ surplus (%)					
♀ surplus (%)					
Mean % surplus (all strains)	<input type="text" value=""/> %				
Disposal of surplus ^{2.}					
1. Clinical waste	1. <input type="text" value=""/> %	2. <input type="text" value=""/> %			
2. Other					
Reason for high/low surplus ^{3.}					
What is the average lead time for ordering (please circle)	1-2 weeks	2-4 weeks	4-8 weeks	7-8 weeks	
Is animal surplus discussed formerly and regularly in your establishment (e.g. in a Committee)	YES	NO	(please circle)		

1. "Issued" means for use in procedures (from in-house breeding colonies) or sold (commercial breeders). Please give numbers if possible, otherwise a % figure.
2. "Other" is considered as being disposal of dead animals for food for zoos, wildlife parks etc. If this is not the case, please comment. Please give the approximate % animals disposed of in either way.
3. Reasons for the amount of surplus may vary considerably depending on the use of the animals. Examples are a) 65% surplus: small colony maintained to provide infrequent offtake, b) 50% surplus: heterozygous breeding/transgenic breeding colony, c) 1% surplus: colony used only for tissue/organ collection. Please give one or more cogent reasons. **Photocopy this form for more than 5 strains**

INBRED BREEDING COLONIES

SPECIES: RAT/MOUSE (delete one)

Data Period

Strain

1

2

3

4

5

Strain name (optional)					
No. ♂ issued (or %) ^{1.}					
No. ♀ issued (or %) ^{1.}					
♂ surplus (%)					
♀ surplus (%)					
Mean % surplus (all strains)	<input type="text"/> %				
Disposal of surplus ^{2.} 1. Clinical waste 2. Other	1. <input type="text"/> %	2. <input type="text"/> %			
Reason for high/low surplus ^{3.}					
What is the average lead time for ordering (please circle)	1-2 weeks	2-4 weeks	4-8 weeks	7-8 weeks	
Is animal surplus discussed formerly and regularly in your establishment (e.g. in a Committee)	YES	NO	(please circle)		

- "Issued" means for use in procedures (from in-house breeding colonies) or sold (commercial breeders). Please give numbers if possible, otherwise a % figure.
- "Other" is considered as being disposal of dead animals for food for zoos, wildlife parks etc. If this is not the case, please comment. Please give the approximate % animals disposed of in either way.

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BREEDING COLONIES OF GENETICALLY MODIFIED MICE (trangemics, mutants, etc.)

Appendix (3 of 6)

Strain	1	2	3	4	Data Period 5
Identification (optional)					
No. ♂ issued (or %) ^{1.}					
No. ♀ issued (or %) ^{1.}					
♂ surplus (%)					
♀ surplus (%)					
Mean % surplus (all strains)	<input type="text" value=""/> %				
Disposal of surplus ^{2.} 1. Clinical waste 2. Other	1. <input type="text" value=""/> %	2. <input type="text" value=""/> %			
Reason for high/low surplus ^{3.}					
Type of breeding (HOM, HET) ^{4.}					
What is the average lead time for ordering (please circle)	1-2 weeks 2-4 weeks 4-8 weeks 7-8 weeks				
Is animal surplus discussed formerly and regularly in your establishment (e.g. in a Committee)	YES NO (please circle)				

1. "Issued" means for use in procedures (from in-house breeding colonies) or sold (commercial breeders). Please give numbers if possible, otherwise a % figure.
2. "Other" is considered as being disposal of dead animals for food for zoos, wildlife parks etc. If this is not the case, please comment. Please give the approximate % animals disposed of in either way.

3. Reasons for the amount of surplus may vary considerably depending on the use of the animals. Examples are a) 65% surplus: small colony maintained to provide infrequent offtake, b) 50% surplus: heterozygous breeding/transgenic breeding colony, c) 1% surplus: colony used only for tissue/organ collection. Please give one or more cogent reasons.
4. Surplus may vary depending on whether the breeding is HOMozygous or HETerozygous **Photocopy this form for more than 5 strains**

OUTBRED PURCHASED ANIMALS

SPECIES: RAT/MOUSE (delete one)

	Data				
Period Strain	1	2	3	4	5
Strain name (optional)					
No. ♂ purchased					
No. ♀ purchased					
♂ surplus (%)					
♀ surplus (%)					
Mean % surplus (all strains)	<input type="text"/> %				
Disposal of surplus ¹ 1. Clinical waste 2. Other	1. <input type="text"/> %	2. <input type="text"/> %	Comments:		
Reason for high/low surplus ² .					
What is the average lead time for ordering (please circle)	1-2 weeks	2-4 weeks	4-8 weeks	7-8 weeks	
Is animal surplus discussed formerly and regularly in your establishment (e.g. in a Committee)	YES	NO	(please circle)		

1. "Other" is considered as being disposal of dead animals as food for zoos or wildlife centres etc., If surplus animals were disposed of, for example, for scientific or educational use by other establishments, please comment.

2. It will be important to know reasons as to why the surplus arose? Examples are: over-ordering (this could relate for e.g. to standing orders which are not consistently used), study cancelled, not used on study, etc.,

Photocopy this form for more than 5 strains

INBRED PURCHASED ANIMALS

SPECIES: RAT/MOUSE (delete one)

	Data				
Period Strain	1	2	3	4	5
Strain name (optional)					
No. ♂ purchased					
No. ♀ purchased					
♂ surplus (%)					
♀ surplus (%)					
Mean % surplus (all strains)					
Disposal of surplus ^{1.} 1. Clinical waste 2. Other	<input type="text"/> %	1. <input type="text"/> %	2. <input type="text"/> %	Comments:	
Reason for high/low surplus ^{2.}					
What is the average lead time for ordering (please circle)	1-2 weeks	2-4 weeks	4-8 weeks	7-8 weeks	
Is animal surplus discussed formerly and regularly in your establishment (e.g. in a Committee)	YES	NO	(please circle)		

1. "Other" is considered as being disposal of dead animals as food for zoos or wildlife centres etc., If surplus animals were disposed of, for example, for scientific or educational use by other establishments, please comment.
2. It will be important to know reasons as to why the surplus arose? Examples are: over-ordering (this could relate for e.g. to standing orders which are not consistently used), study cancelled, not used on study, etc., **Photocopy this form for more than 5 strains**

PURCHASED GENETICALLY MODIFIED MICE

Strain

1

2

3

4

Identification (optional)					
No. Γ purchased					
No. E purchased					
Γ surplus (%)					
E surplus (%)					
Mean % surplus (all strains)	<input type="text" value=""/> %				
Disposal of surplus ^{1.} 1. Clinical waste 2. Other	1. <input type="text" value=""/> %	2. <input type="text" value=""/> %	Comments:		
Reason for high/low surplus ^{2.}					
What is the average lead time for ordering (please circle)	1-2 weeks 2-4 weeks 4-8 weeks 7-8 weeks				
Is animal surplus discussed formerly and regularly in your establishment (e.g. in a Committee)	YES NO (please circle)				

1. "Other" is considered as being disposal of dead animals as food for zoos or wildlife centres etc., If surplus animals were disposed of, for example, for scientific or educational use by other establishments, please comment.
2. It will be important to know reasons as to why the surplus arose? Examples are: over-ordering (this could relate for e.g. to standing orders which are not consistently used), study cancelled, not used on study, etc., **Photocopy this form for more than 5 strains**