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NATIONAL SURVEY OF LABORATORY ANIMAL FACILITIES AND RESOURCES

Prepared by:

Committee on Laboratory Animal Facilities and Resources
Institute of Laboratory Animal Resources
National Academy of Sciences
Division of Biological Sciences
Assembly of Life Sciences

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INSTITUTE OF LABORATORY ANIMAL RESOURCES

The Institute of Laboratory Animal Resources (ILAR) was founded in 1952 under the auspices of the National Research Council (NRC) and its parent organization, the National Academy of Sciences (NAS). A component of the Division of Biological Sciences, Assembly of Life Sciences, ILAR serves as a coordinating agency and a national and international resource for compiling and disseminating information on laboratory animals, promoting education, planning and conducting conferences and symposia, surveying existing and required facilities and resources, upgrading laboratory animal resources, and promoting high-quality, humane care of laboratory animals in the United States.

NOTICE: The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The members of the committee responsible for the report were chosen for their special competence and with regard for appropriate balance.

This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

This project (NIH Evaluation Project No. DRR 77-5; Contract NO1-RR-7-2114) was supported from the evaluation set-aside, Section 513, Public Health Service Act.

PREFACE

In response to a request in 1960 from the Director, National Institutes of Health (NIH), the Institute of Laboratory Animal Resources (ILAR) of the National Academy of Sciences-National Research Council (NAS-NRC) conducted a survey of laboratory animal facilities in nonprofit, non-Federal biomedical research institutions. The survey was completed in September 1962, and the results of the survey were published in March 1964 in the report Animal Facilities in Medical Research.

Early in 1967, the Director of the NIH requested that the NAS-NRC carry out a second survey of laboratory animal facilities and resources. An ILAR Committee on Laboratory Animal Facilities and Resources Survey planned, organized, and supervised the conduct of the study. This second survey included Federal agencies, commercial research laboratories, the pharmaceutical industry, and nonprofit organizations that used animals for purposes other than biomedical research. The results of the enterprise conducted during fiscal year (FY) 1968 were presented in a report entitled "Laboratory Animal Facilities and Resources Supporting Biomedical Research," published in Laboratory Animal Care, 20:795-869, 1970.

Because many changes had taken place since the second survey, and much of the information obtained in the first two surveys was no longer relevant, there was a need to gather current information for comparative purposes and for future planning. The first surveys had been useful to the NIH in planning and establishing programs for improving the quality and availability

of laboratory animals, promoting better institutional care and humane treatment of laboratory animals, providing better facilities, and establishing training programs in laboratory animal medicine. The data were also used by research institutions in planning their programs to provide the animals and animal care essential to high-quality research.

Rapid evolution of biomedical research, significant changes in required resources, and increasing costs and budgetary limitations are characteristics of the current period. A third survey was aimed at the collection and analysis of objective data on the current status of, unfilled needs in, and future requirements for research animals, animal resource personnel, facilities, and programs throughout the United States during FY 1978.

This report is based on data derived from a national mail survey conducted by the Institute of Laboratory Animal Resources at the request of the National Institutes of Health under contract NO1-RR-7-2114 administered by the Animal Resources Program Branch of the NIH Division of Research Resources.

Although primary attention in this report is given to nonprofit organizations that were eligible for Federal grants and that conducted biomedical research during FY 1978, data were also received from Federal agencies, commercial research laboratories, the pharmaceutical industry, and nonprofit organizations that used animals for purposes other than biomedical research.

The FY 1968 survey questionnaire was used as a guide in the design of the questionnaire for the FY 1978 effort. Modifications were made collaboratively by the committee, staff, and NIH representatives. In addition, suggestions for modifications were received, in response to a pretest solicitation, from representative academic institutions, Government agencies, and other typical potential respondents. The questionnaire used in the FY 1978 survey

is included as the appendix. Unless otherwise specified, information identified as "FY 1968" was derived directly from the published report of the FY 1968 survey.

Appropriate data processing techniques were used to enter the data in the NAS-NRC computer; and the accuracy of data processing procedures and the validity and consistency of data provided by respondents were ensured by continuous editing. The committee is indebted to many persons for assistance in the conduct of this study, particularly to the recipients of the questionnaire who provided the data.

Committee on Laboratory Animal
Facilities and Resources

C. Max Lang, Chairman
John G. Adams
Emerson L. Besch
Richard R. Fox
Robert R. Jorgensen
William A. Knapp, Jr.
James R. Pick, Jr.
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Samuel Abramson, Staff Officer

EXECUTIVE SUMMARY

This is a report of a national survey of laboratory animal facilities and resources conducted by the National Academy of Sciences - National Research Council Institute of Laboratory Animal Resources at the request of the Animal Resources Program Branch of the NIH Division of Research Resources. Two earlier surveys (reported in 1964 and 1970) had been conducted by ILAR at the request of NIH. Since these reports were published, many changes have taken place and, therefore, much of the information in the first two surveys is no longer relevant. It was deemed essential that updated information be developed.

The third survey was aimed at the collection and analysis of objective data on the current status of, unfilled needs in, and future requirements for research animals, animal resource personnel, facilities and programs throughout the United States during FY 1978. Although primary attention in this report is given to nonprofit organizations that were eligible for Federal grants and that conducted biomedical research during FY 1978, data were also received from Federal agencies, commercial research laboratories, the pharmaceutical industry, and nonprofit organizations that used animals for purposes other than biomedical research.

Appropriate data processing techniques were used to enter the data in the NAS-NRC computer; and the accuracy of data-processing procedures and the validity and consistency of data provided by respondents were ensured by continuous editing.

Survey questionnaires were distributed to 2,637 known users of laboratory animals in the United States, and 1,902 (72 percent) were returned. Of these, the responses of 1,252 organizations (47 percent of those solicited) fulfilled the criteria of the authoring committee (ILAR Committee on Laboratory Animal Facilities and Resources)[a] for inclusion in the response population for aggregate analysis. These organizations included 992 nonprofit, NIH-grant-eligible institutions (including 489 biomedical research organizations with annual research budgets of at least $5,000), 137 commercial institutions (including 52 member firms of the Pharmaceutical Manufacturers Association), 25 components of the Department of Defense (DOD), 21 units of the U.S. Department of Health, Education, and Welfare (DHEW), and 77 components of other Federal agencies. The biomedical research organizations included 69 schools of medicine, 10 schools of veterinary medicine, 42 other health professional schools (dental, public health, life sciences, etc.), 149 universities and colleges, 76 universities with affiliated professional schools, 65 hospitals, and 78 Federal-grant-eligible research institutes or laboratories.

Separate sections of the report are devoted to the following topics: dimensions of survey population, animal use and sources, facility administration and personnel, facilities and equipment, costs of animal care, and appendix (the survey questionnaire). Each of these sections has two parts: current status, and comments and projections. In selected areas of interest, comparisons are made between the data derived from the FY 1968 and FY 1978 surveys.

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[a] Membership of Committee: C. Max Lang, (Chairman); John G. Adams; Emerson L. Besch; Richard R. Fox; Robert R. Jorgensen; William A. Knapp, Jr.; James R. Pick, Jr.; Stefano Vivona; Samuel Abramson, (Staff Officer)

MAJOR FINDINGS AND CONCLUSIONS:

Animal Use and Sources

- The number of laboratory animals acquired during the last decade (between the FY 1968 and FY 1978 surveys) has decreased. Nonprofit biomedical research organizations reported decreases in the acquisition of mice, carnivores, sheep and goats, birds, and nonhuman primates. But when the data were summarized for all respondents, there was a decrease in acquisitions of all species except other rodents, swine, and cattle and horses. These changes during the past 10 years could have resulted from any of the following factors: noncomparability of survey respondents, substantial reduction in breeding colonies maintained for in-house production, and decreases in available funding, available space, and/or ability to comply with current guidelines for housing and care.

- The majority of respondents that acquire animals from their own breeding sources do not maintain genetic records. This is regarded by the committee as a substandard practice that is incompatible with quality research.

- The changes during the last decade in the total number and species of animals used may have been affected by the substantial changes in research methods during this period. For example, shifts from short-term animal studies to longer-term studies, increased awareness of environmental factors that may affect research data, and increases in the kinds of investigation that require containment housing would all tend to reduce the efficiency of space use.

- The substantial decrease in the number of nonhuman primates is almost certainly because of their reduced availability and increased cost. The substantial increases in average daily inventory and length of stay suggest that those now available are being conserved for essential long-term studies or breeding colonies.

- The committee believes that the overall decrease in acquisition of animals from own breeding sources is due to several factors: lack of animal space, unit cost per animal is higher than for those commercially available, greater variety available from commercial sources, requirement for uniformity in animals to obtain reproducible results, and ready availability to investigators.

- The committee believes that in the next decade, scientists will rely increasingly on commercial sources for acquisition of animals that are known to be of good quality and defined genetic background.

- The number of nonprofit biomedical research organizations importing animals from outside the continental United States (7 percent) is of concern to the committee because of the possibility of introduction of diseases that are not indigenous to this country or for which there is no effective means of diagnosis or control. Precautions should be taken in establishing quarantine, in-house testing, and methods of introducing animals and biologic material into a research facility to prevent serious epidemics of disease.

Facility Administration and Personnel

- Approximately 82 percent of all responding organizations stated that they were in compliance with DHEW guidelines for care and use of laboratory animals. A substantial number of these organizations stated that this compliance was determined by their own institutional committee, or on the basis of such miscellaneous standards as "certification by department chairman," "exercise of local supervision," or "state inspection." This could reflect a high level of institutional concern for humane animal care or a lack of familiarity with DHEW guidelines.

- During the last decade there has been a surprisingly small increase in the number of nonprofit organizations that achieved peer recognition of compliance with DHEW guidelines for care and use of laboratory animals, i.e., accreditation by the American Association for Accreditation of Laboratory Animal Care (AAALAC). For unknown reasons, the relatively high number of organizations (over 370) planning to apply for accreditation at the time of the FY 1968 survey did not, or could not, achieve that status by FY 1978.

- Personnel changes during the last decade reflect, primarily, an emphasis on quality animal care--i.e., an increase in veterinarians trained in laboratory animal medicine. This trend is expected to continue at least through the next decade.

Facilities and Equipment

- Nonprofit biomedical research organizations reported having a total of approximately 10 million net square feet (nsf) of laboratory animal facility in use or under construction in FY 1978, an increase of approximately 2.5 million nsf over the space reported in the FY 1968 survey. The estimated replacement value of this space is $1.4 billion.

- Animal facility space use is devoted primarily to biomedical research activities; the median was approximately 70 percent. This is similar to that reported in FY 1968.

- Approximately 16 percent of all nonprofit biomedical research organizations reported a need for replacement of some animal facility space now in use, 38 percent reported a need for remodeling to protect the integrity of space now in use, and 43 percent reported a current need for additional space.

- Approximately $350 million is required to meet current needs of nonprofit biomedical research organizations for space replacement, remodeling, and additions. Another $407 million (using FY 1978 estimated construction costs) will be required to meet space needs projected for FY 1988.

- Nonprofit biomedical research organizations reported a current need of $43 million for equipment renovation, replacement, or additions.

- It is surmised that the failure to acquire space and equipment may have been a factor in some organizations reports of inability to comply with DHEW guidelines for animal care. If that is true, it emphasizes the crucial need for funding to support the replacement, remodeling, construction, and equipping of laboratory animal facility space.

- The committee believes that biohazard containment space and equipment needs reflect changes in research activities, as well as an awareness in the biomedical research community of the need to contain hazardous agents. It is recognized that not all organizations are engaged in research with hazardous agents, but the substantial needs reported suggest that there should be priority funding for fulfilling these needs.

- The increase in the availability of diagnostic laboratory equipment, plus the current needs, reflect an awareness of the importance of diagnostic laboratory support as an aid in providing high-quality animal care and increasing the reliability of research data, especially in long-term studies.

Costs of Animal Care

- Nonprofit biomedical research organizations reported expenditures of approximately $2.2 billion for biomedical research in FY 1978. This represents a substantial increase (28 percent), when corrected for inflation, over expenditures

reported in FY 1968. Approximately $800 million (a 1 percent increase over adjusted FY 1968) of this amount was for research projects involving the use of some laboratory animals, of which $571 million (a 7 percent increase over adjusted FY 1968) was furnished by grants and contracts from the NIH.

- Approximately 35 percent of the total biomedical research budget is for research projects involving the use of laboratory animals, an apparent decrease from the 44 percent reported in FY 1968; the decrease suggests that other aspects of research are increasing in cost at a slightly greater rate than animal care.

- In spite of the increase in biomedical research funds, recovery of animal care costs has not kept pace with actual costs. User fees, including per diem costs, vary widely and do not appear to have achieved the level of cost-accounting that is necessary to ensure an equitable distribution of costs on a direct-charge basis.

- Although the user fee, including the per diem charge, is only one of many possible mechanisms of apportioning direct costs to research projects, it can--if properly determined--be the most accurate basis for assessing equitable costs.

- Financial accountability of animal care programs can be expected to receive increasing attention in the next decade. Primary factors that can help to achieve efficiency include centralization of animal care programs within the research organization and the use of cost-accounting[a] as a more effective management tool.

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[a] Cost Analysis and Rate Setting Manual for Animal Resource Facilities. Rev. October 1979. NIH Publication No. 80-2006.

DIMENSIONS OF SURVEY POPULATION

Survey questionnaires were distributed to a comprehensive national group consisting of 2,637 known users of laboratory animals in the United States. The survey mailing list was derived from a composite of addresses made available through the mailing lists of universities and colleges maintained by the NRC for National Science Foundation fellowship programs; the Association of American Medical Colleges (AAMC) Directory of American Medical Education; the American Hospital Association (AHA) Guide to the Health Care Field; the directory of member institutions of the Association for Academic Health Centers (AAHC); the directory of the American Veterinary Medical Association (AVMA); the List of Registered Research Facilities compiled by the U.S. Department of Agriculture (USDA) Animal and Plant Inspection Service, pursuant to the provisions of the Animal Welfare Act; the list of organizations receiving support from the NIH; and the list of Veterans' Administration (VA) hospitals with animal research facilities. In addition, other major Federal agencies that utilize laboratory animals solicited their components, and the Pharmaceutical Manufacturers Association (PMA) solicited its member firms, for completion of the survey questionnaire.

Duplication and multiple responses from some animal facilities were eliminated by careful cross-checking. In all cases, respondent organizations were assured that the report to be derived from this survey would deal with aggregate data and that no identification of individual sources of information would be made. Arrangements were also made to eliminate all specific identification from questionnaires returned by member firms of the PMA.

Of the 2,637 questionnaires distributed, 1,902 (72 percent) were returned (table 1). The 735 that were not returned were those sent to 700 institutions that never responded despite a followup solicitation, 21 institutions that refused to participate, and 14 institutions with faulty addresses. Of the 1,902 responses, 702 institutions had minimal or no animal facilities. In addition, 52 questionnaires were returned by member firms of the PMA. Thus, the response population available for aggregate analysis of data totaled 1,252 organizations (47 percent of the organizations solicited). These organizations (table 2) consisted of 992 nonprofit, NIH-grant-eligible institutions (including 489 biomedical research organizations with annual research budgets of at least $5,000), 137 commercial institutions (including 52 member firms of the PMA), 25 components of the Department of Defense, 21 units of the U.S. Department of Health, Education, and Welfare, and 77 components of other Federal agencies.

The biomedical research organizations (table 3) included 69 schools of medicine, 10 schools of veterinary medicine, 42 other health professional schools (dental, public health, life sciences, etc.), 149 universities and colleges, 76 universities with affiliated professional schools, 65 hospitals, and 78 Federal-grant-eligible research institutes or laboratories. Some of the health professional schools (especially schools of medicine and veterinary medicine) were included in other group categories, e.g., universities with affiliated professional schools, thus accounting for a smaller number of such schools identified separately than expected. In all cases, institutions were instructed to complete relevant parts of the survey questionnaire on the basis of the animal activities for which they had scientific supervision and operating budget control.

TABLE 1. Selection of Response Population Used for Analysis

Organizations solicited	2,637
Nonrespondents	- 735
Respondents	1,902
Organizations with minimal or no animal facilities	- 702
	1,200
PMA member firms	+ 52
Response population used for analysis	1,252

TABLE 2. Types of Organizations in Response Population Used for Analysis

Nonprofit organizations		
Conduct biomedical research	489	
Do not conduct biomedical research	503	
Total nonprofit organizations		992
Commercial organizations (including 52 PMA member firms)		137
U.S. Department of Defense		25
U.S. Department of Health, Education, and Welfare		21
Other Federal agencies		77
Total organizations in population analyzed		1,252

TABLE 3. Types of Nonprofit Biomedical Research Organizations

Schools	
Medical	69
Veterinary	10
Other health professional	42
Universities and colleges	149
Universities with affiliated professional[a]	76
Hospitals	65
Research institutes and laboratories	78
Total	489

[a] This group includes some schools of medicine, schools of veterinary medicine, and other health professional schools (e.g., dental schools).

ANIMAL USE AND SOURCES

CURRENT STATUS

The responses of 489 nonprofit biomedical research and 763 other organizations were used for data analysis in this survey, whereas in the FY 1968 survey 683 nonprofit biomedical research and 688 other organizations were analyzed. Part of the apparent decrease in the number of responding nonprofit biomedical research organizations in FY 1978 may have been due to a reorganization for inclusion by category--i.e., institutions that reported separately in FY 1968 may have sent in combined reports in FY 1978--or to the committee's decision to use data only from nonprofit biomedical research organizations with annual research budgets of at least $5,000. However, it appears that both surveys included most of the organizations that use animals in biomedical research.

Animal Use

There appears to have been a decrease in the number of laboratory animals acquired during the last decade (tables 4a and 4b). Nonprofit biomedical research organizations reported decreases in the acquisition of mice, carnivores, sheep and goats, birds, and nonhuman primates (table 4a). However, when the data were summarized for all respondents, there were decreased acquisitions of all species except other rodents, swine, and cattle and horses (table 4b).

Although fewer animals were acquired in FY 1978, these decreases were not always consistent with the changes in average daily inventory (tables 5a and 5b) or average length of stay (tables 6a and 6b). For example, fewer mice and

TABLE 4a. Laboratory Animals Acquired[a] by Nonprofit Biomedical Research Organizations[b] in FY 1968 and FY 1978

Species	Number of Animals		
	FY 1968[c]	FY 1978	Net Change, %
Rodents			
Mice	7,150,100	5,577,299	- 22
Rats	1,898,200	1,959,536	+ 3
Hamsters	239,000	259,789	+ 9
Guinea pigs	162,400	213,822	+ 32
Other rodents	33,000	60,421	+ 83
Subtotal	9,482,700	8,070,867	- 15
Rabbits	204,200	299,185	+ 47
Carnivores			
Dogs	173,100	121,024	- 30
Cats	58,900	42,418	- 28
Other carnivores	4,500	4,294	- 5
Subtotal	236,500	167,736	- 29
Ungulates			
Swine	19,200	96,618	+403
Sheep and goats	15,800	7,813	- 51
Cattle and horses	10,600	24,731	+133
Other ungulates	300	311	+ 4
Subtotal	45,900	129,473	+182
Birds	602,800	141,543	- 77
Nonhuman primates			
Old World monkeys	13,300	9,014	- 32
New World monkeys	8,500	2,117	- 75
Subtotal	21,800	11,131	- 49
Total (all animals)	10,593,900	8,819,935	- 17

[a] Acquired by own breeding and from commercial sources.

[b] Organizations that conduct biomedical research, are eligible for federal grants, and have a biomedical research budget of at least $5,000/yr.

[c] Numbers were rounded off to the nearest 100 in the FY 1968 survey results.

TABLE 4b. Laboratory Animals Acquired[a] by Nonprofit, Commercial, Military, DHEW, and Other Federal Organizations in FY 1968 and FY 1978

Species	Number of Animals		
	FY 1968[b]	FY 1978	Net Change, %
Rodents			
Mice	22,772,300	13,413,813	-41
Rats	6,131,000	4,358,766	-29
Hamsters	785,900	368,934	-53
Guinea pigs	613,300	426,665	-30
Other rodents	60,500	79,993	+32
Subtotal	30,363,000	18,648,171	-39
Rabbits	504,500	439,986	-13
Carnivores			
Dogs	262,000	183,063	-30
Cats	99,300	54,908	-45
Other carnivores	9,100	4,990	-45
Subtotal	370,400	242,961	-34
Ungulates			
Swine	53,600	104,769	+95
Sheep and goats	27,700	12,610	-54
Cattle and horses	24,500	26,897	+10
Other ungulates	400	319	-20
Subtotal	106,200	144,595	+36
Birds	2,070,500	450,352	-78
Nonhuman primates			
Old World monkeys	43,600	25,857	-41
New World monkeys	14,100	4,466	-68
Subtotal	57,700	30,323	-47
Total (all animals)	33,472,300	19,956,388	-40

[a] Acquired by own breeding and from commercial sources.

[b] Numbers were rounded off to the nearest 100 in the FY 1968 survey results.

TABLE 5a. Average Daily Inventory of Laboratory Animals in Nonprofit Biomedical Research Organizations in FY 1968 and FY 1978

Species	Number of Animals		
	FY 1968[a]	FY 1978	Net Change, %
Rodents			
Mice	1,477,684	1,760,331	+19
Rats	372,864	428,265	+15
Hamsters	55,791	42,568	-24
Guinea pigs	41,135	25,970	-37
Other rodents	17,253	28,272	+64
Subtotal	1,964,727	2,285,406	+16
Rabbits	46,082	39,669	-14
Carnivores			
Dogs	28,411	14,165	-50
Cats	8,527	6,894	-19
Other carnivores	1,605	671	-58
Subtotal	38,543	21,730	-44
Ungulates			
Swine	7,219	3,284	-55
Sheep and goats	11,558	5,374	-54
Cattle and horses	13,773	3,564	-74
Other ungulates	244	109	-55
Subtotal	32,794	12,331	-62
Birds	184,401	36,019	-80
Nonhuman primates			
Old World monkeys	14,652	19,024	+30
New World monkeys	5,712	4,312	-25
Subtotal	20,364	23,336	+15
Total (all animals)	2,286,911	2,418,491	+ 6

[a]Derived from unpublished results of FY 1968 survey.

TABLE 5b. Average Daily Inventory of Laboratory Animals in Nonprofit, Commercial, Military, DHEW, and Other Federal Organizations in FY 1968 and FY 1978

Species	Number of Animals		
	FY 1968 [a]	FY 1978	Net Change, %
Rodents			
Mice	2,734,600	3,563,485	+30
Rats	721,300	921,074	+28
Hamsters	121,200	76,453	-37
Guinea pigs	122,500	70,956	-42
Other rodents	28,300	40,150	+42
Subtotal	3,727,900	4,672,118	+25
Rabbits	95,700	79,062	-17
Carnivores			
Dogs	57,200	37,370	-35
Cats	14,200	11,231	-21
Other carnivores	3,200	1,012	-68
Subtotal	74,600	49,613	-33
Ungulates			
Swine	18,600	5,358	-71
Sheep and goats	21,900	8,393	-62
Cattle and horses	25,400	5,253	-79
Other ungulates	300	118	-61
Subtotal	66,200	19,122	-71
Birds	367,300	71,505	-81
Nonhuman primates			
Old World monkeys	25,800	36,862	+43
New World monkeys	8,400	9,331	+11
Subtotal	34,200	46,193	+35
Total (all animals)	4,365,900	4,937,613	+13

[a] Numbers were rounded off to the nearest 100 in the FY 1968 survey results.

TABLE 6a. Average Length of Stay[a] of Laboratory Animals in Nonprofit Biomedical Research Organizations in FY 1968 and FY 1978

Species	Length of Stay, days		
	FY 1968	FY 1978	Net Change, %
Rodents			
Mice	75	115	+ 56
Rats	72	80	+ 11
Hamsters	85	60	- 29
Guinea pigs	92	44	- 52
Other rodents	191	171	- 10
Rabbits	82	48	- 41
Carnivores			
Dogs	60	43	- 28
Cats	53	59	+ 11
Other carnivores	130	57	- 56
Ungulates			
Swine	137	12	- 91
Sheep and goats	267	251	- 6
Cattle and horses	474	53	- 89
Other ungulates	297	128	- 87
Birds	112	93	- 17
Nonhuman primates			
Old World monkeys	402	770	+ 92
New World monkeys	245	743	+203

[a]Determined by multiplying average daily inventory (table 5a) by 365 and dividing the product by the number of animals acquired (table 4a).

TABLE 6b. Average Length of Stay[a] of Laboratory Animals in Nonprofit, Commercial, Military, DHEW, and Other Federal Organizations in FY 1968 and FY 1978

Species	Length of Stay, days		
	FY 1968	FY 1978	Net Change, %
Rodents			
Mice	44	97	+120
Rats	43	77	+ 79
Hamsters	56	76	+ 36
Guinea pigs	73	61	- 16
Other rodents	171	183	+ 7
Rabbits	69	66	- 4
Carnivores			
Dogs	80	75	- 6
Cats	52	75	+ 44
Other carnivores	128	74	- 42
Ungulates			
Swine	127	19	- 85
Sheep and goats	289	243	- 16
Cattle and horses	378	71	- 81
Other ungulates	274	135	- 51
Birds	65	58	- 11
Nonhuman primates			
Old World monkeys	216	520	+141
New World monkeys	217	763	+252

[a]Determined by multiplying the average daily inventory (table 5b) by 365 and dividing the product by the number of animals acquired (table 4b).

rats were acquired by all respondents (table 4b), but there were substantial increases in the average daily inventory (table 5b) and the average length of stay (table 6b) of these animals. The number of hamsters acquired and average daily inventory decreased, but there was an increase in their average length of stay. However, there were consistent decreases in acquisition, average daily inventory, and average length of stay of guinea pigs, dogs, sheep and goats, and birds.

Sources of Animals

In comparison with FY 1968, the fraction of animals acquired by nonprofit biomedical research organizations from own breeding in FY 1978 has decreased for most groups of species--i.e., rodents, rabbits, carnivores, birds, and ungulates--but has increased for nonhuman primates (tables 7a and 7b). Similarly, a smaller fraction of the animals used were acquired from own breeding (tables 7a-1, 7a-2, 7b-1, and 7b-2).

It appears that a failure to apply appropriate genetic management principles is a major deficiency in institutions that acquire animals from their own breeding sources (tables 7a and 7b). Although the respondents categorized their breeding production by recognized breeding systems (i.e., random-bred, inbred, and hybrid), the majority do not maintain genetic records. Excluding the relatively small numbers of nonhuman primate species, the highest percentages of genetic records maintained by respondents were for bred-for-research dogs and cats--and they were only 64 percent and 63 percent (table 7b).

There was considerable variation among the categories of respondents that acquired random-bred and inbred mice from own breeding sources (table 8). Some organizations (DHEW, military organizations, research institutes and laboratories,

TABLE 7a. Various Species of Laboratory Animals Acquired by Nonprofit Biomedical Research Organization by Sources

Species	No. Acquired from Own Breeding (FY 1978)				% Inst. Genetic Records	Subtotal	
	Random-bred	Inbred	Hybrid	Other		FY 1968	FY 1978
Rodents							
Mice	981,924	926,814	181,066	5,726	44	3,953,800	2,095,530
Rats	208,009	144,670	23,103	635	30	305,400	376,417
Hamsters	22,004	15,300	315	47	23	39,500	37,666
Guinea pigs	23,592	4,889	144	18	20	35,000	28,643
Other rodents	14,912	898	8	115	14	19,000	15,933
Total rodents	1,250,441	1,092,571	204,636	6,541		4,352,700	2,554,189
Rabbits	3,397	646	3,114	40	10	15,800	7,197
Carnivores[a]							
Dogs (rs)	227	21	250	-	4	200	498
Dogs (br)	482	141	40	11	58	5,200	674
Cats (rs)	910	7	80	-	4	2,400[b]	997
Cats (br)	1,060	549	93	-	64		1,702
Other carnivores	63	-	6	-	13	2,100	69
Total carnivores	2,742	718	469	11		9,900	3,940
Birds	16,614	26,522	6,103	54	20	193,600	49,293
Ungulates							
Swine	2,353	476	-	-	21	12,900	2,829
Sheep	1,402	313	4	60	19	6,700[b]	1,779
Goats	296	10	-	-	8		306
Cattle	1,346	75	-	-	21	4,700[b]	1,421
Horses	53	17	-	-	8		70
Other ungulates	48	-	-	-	0	100	48
Total ungulates	5,498	891	4	60		24,400	6,453
Nonhuman primates							
Rhesus	1,011		6	1	26	[c]	1,018
Cynomolgus	107		1	-	9	[c]	108
Stumptails	79		-	-	13	[c]	79
Other macaque species	420		-	-	44	[c]	420
Baboons	336		8	87	29	[c]	431
African green monkeys	26		-	-	25	[c]	26
Chimpanzees	42		-	-	67	[c]	42
Gibbons	4		-	-	50	[c]	4
Other Old World species	61		-	-	38	[c]	61
Total Old World primates	2,086		15	88		2,000	2,189
Squirrel monkeys	221		-	-	20	[c]	221
Tamarins	159		3	10	75	[c]	172
Marmosets	231		10	-	40	[c]	241
Owl monkeys	10		1	-	17	[c]	11
Other New World species	75		6	-	14	[c]	81
Total New World primates	696		20	10		400	726
Total nonhuman primates	2,782		35	98		2,400	2,915

[a] rs = random source (compared with animals reported as nonconditioned in FY 1968 survey).
br = bred for research (compared with animals reported as conditioned in FY 1968 survey).

[b] In FY 1968 survey, numbers of cats were reported as a single unit, and numbers of sheep and goats and numbers of cattle and horses were reported as single units.

[c] In 1968 survey, number of nonhuman primates reported only for total Old World species and total New World species.

TABLE 7a-1. Various Species of Laboratory Animals Acquired by Nonprofit Biomedical Research Organizations by Sources

Species	No. Acquired from Commercial Sources (FY 1978)				Subtotal	
	Random-bred	Inbred	Hybrid	Other	FY 1968	FY 1978
Rodents						
Mice	1,714,507	1,468,182	187,968	111,112	3,196,300	3,481,769
Rats	1,213,247	264,553	23,369	81,950	1,592,800	1,583,119
Hamsters	84,349	132,620	1,729	3,425	199,500	222,123
Guinea pigs	172,514	9,351	781	2,533	127,400	185,179
Other rodents	27,593	8,100	5	8,790	14,000	44,488
Total rodents	3,212,210	1,882,806	213,852	207,810	5,130,000	5,516,678
Rabbits	275,714	6,951	920	8,403	188,400	291,988
Carnivores[a]						
Dogs (rs)	90,875	639	990	7,611	146,900	100,115
Dogs (br)	18,358	1,335	16	28	20,800	19,737
Cats (rs)	34,330	265	750	4,110	56,500[b]	39,455
Cats (br)	244	14	-	6		264
Other carnivores	2,949	-	-	1,276	2,400	4,225
Total carnivores	146,756	2,253	1,756	13,031	226,600	163,796
Birds	79,399	9,226	3,438	187	409,200	92,250
Ungulates						
Swine	93,543	23	111	112	6,300	93,789
Sheep	4,256	9	139	131	9,100[b]	4,535
Goats	1,066	-	7	120		1,193
Cattle	21,265	5	135	5	5,900[b]	21,410
Horses	1,768	25	12	25		1,830
Other ungulates	263	-	-	-	200	263
Total ungulates	122,161	62	404	393	21,500	123,020
Nonhuman primates						
Rhesus	3,758		1	146	[c]	3,905
Cynomolgus	1,081		-	71	[c]	1,152
Stumptails	113		-	1	[c]	114
Other macaque species	454		-	-	[c]	454
Baboons	932		-	2	[c]	934
African green monkeys	97		-	4	[c]	101
Chimpanzees	78		-	-	[c]	78
Gibbons	-		-	-	[c]	-
Other Old World species	79		8	-	[c]	87
Total Old World primates	6,592		9	224	11,300	6,825
Squirrel monkeys	290		-	11	[c]	301
Tamarins	34		-	-	[c]	34
Marmosets	57		-	-	[c]	57
Owl monkeys	826		-	1	[c]	827
Other New World species	172		-	-	[c]	172
Total New World primates	1,379			12	8,100	1,391
Total nonhuman primates	7,971		9	236	19,400	8,216

[a] rs = random source (compared with animals reported as nonconditioned in FY 1968 survey).
br = bred for research (compared with animals reported as conditioned in FY 1968 survey).

[b] In FY 1968 survey, numbers of cats were reported as a single unit, and numbers of sheep and goats and numbers of cattle and horses were reported as single units.

[c] In 1968 survey, number of nonhuman primates reported only for total Old World species and total New World species.

TABLE 7a-2. Total Number of Various Species of Laboratory Animals Acquired by Nonprofit Biomedical Research Organizations and Percent Acquired from Commercial Sources in FY 1968 and FY 1978

Species	Total Number		% Acquired from Commercial Sources	
	FY 1968	FY 1978	FY 1968	FY 1978
Rodents				
Mice	7,150,100	5,577,299	45	62
Rats	1,898,200	1,959,536	84	81
Hamsters	239,000	259,789	83	86
Guinea pigs	162,400	213,822	78	87
Other rodents	33,000	60,421	42	74
Total rodents	9,482,700	8,070,861	54	68
Rabbits	204,200	299,185	92	98
Carnivores[a]				
Dogs (rs)	147,100	100,613	99.7	99.5
Dogs (br)	26,000	20,411	80	97
Cats (rs)	58,900[b]	40,452	96[b]	98
Cats (br)		1,966		13
Other carnivores	4,500	4,294	53	98
Total carnivores	236,500	167,736	96	98
Birds	602,800	141,543	68	65
Ungulates				
Swine	19,200	96,618	33	97
Sheep	15,800[b]	6,314	58[b]	72
Goats		1,499		80
Cattle	10,600[b]	22,831	56[b]	94
Horses		1,900		96
Other ungulates	300	311	67	85
Total ungulates	45,900	129,473	47	95
Nonhuman primates				
Rhesus	[c]	4,923	[c]	79
Cynomolgus	[c]	1,260	[c]	91
Stumptails	[c]	193	[c]	59
Other macaque species	[c]	874	[c]	52
Baboons	[c]	1,365	[c]	68
African green monkeys	[c]	127	[c]	80
Chimpanzees	[c]	120	[c]	65
Gibbons	[c]	4	[c]	-
Other Old World species		148		59
Total Old World primates	13,300	9,014	85	59
Squirrel monkeys	[c]	522	[c]	58
Tamarins	[c]	206	[c]	17
Marmosets	[c]	298	[c]	19
Owl monkeys	[c]	838	[c]	99
Other New World species		253		68
Total New World primates	8,500	2,117	95	68
Total nonhuman primates	21,800	11,131	89	74

[a] rs = random source (compared with animals reported as nonconditioned in FY 1968 survey).
br = bred for research (compared with animals reported as conditioned in FY 1968 survey).

[b] In FY 1968 survey, numbers of cats were reported as a single unit, and numbers of sheep and goats and numbers of cattle and horses were reported as single units.

[c] In 1968 survey, number of nonhuman primates reported only for total Old World species and total New World species.

TABLE 7b. Various Species of Laboratory Animals Acquired by Nonprofit, Commercial, Military, DHEW, and Other Federal Organizations by Sources

Species	No. Acquired from Own Breeding (FY 1978) Random-bred	Inbred	Hybrid	Other	% Inst. Genetic Records	Subtotal FY 1968	Subtotal FY 1978
Rodents							
Mice	2,918,284	1,349,069	343,832	18,048	31	11,357,300	4,629,233
Rats	550,143	226,377	27,100	8,878	22	1,559,000	812,498
Hamsters	33,352	19,947	975	172	20	382,300	54,446
Guinea pigs	56,164	6,747	169	43	15	205,300	63,123
Other rodents	23,614	1,160	221	865	13	34,200	25,860
Total rodents	3,581,557	1,603,300	372,297	28,006		13,538,100	5,585,160
Rabbits	17,396	1,198	4,457	88	11	46,700	23,139
Carnivores[a]							
Dogs (rs)	849	21	250	22	7	1,900	1,142
Dogs (br)	3,485	6,312	40	105	64	12,600	9,942
Cats (rs)	1,286	7	80	10	5	3,800[b]	1,383
Cats (br)	2,378	549	93	-	63		3,020
Other carnivores	128	-	6	24	6	2,100	158
Total carnivores	8,126	6,889	469	161		20,400	15,645
Birds	35,021	34,041	10,428	13,810	13	450,200	93,300
Ungulates							
Swine	5,001	731	-	1,216	30	38,900	6,958
Sheep	1,874	348	4	930	19	9,900[b]	3,156
Goats	526	10	-	10	5		546
Cattle	1,496	75	-	52	14	11,200[b]	1,623
Horses	78	17	-	45	8		140
Other ungulates	54	-	-	-	0	100	54
Total ungulates	9,039	1,181	4	2,253		60,100	12,477
Nonhuman primates							
Rhesus	2,324		86	1	29	[c]	2,411
Cynomolgus	298		1	-	9	[c]	299
Stumptails	127		-	-	23	[c]	127
Other macaques	502		-	-	43	[c]	502
Baboons	336		8	87	21	[c]	431
African green monkeys	53		-	-	33	[c]	53
Chimpanzees	43		-	-	40	[c]	43
Gibbons	6		-	-	67	[c]	6
Other Old World species	115		-	-	40	[c]	115
Total Old World primates	3,804		95	88		2,200	3,987
Squirrel monkeys	346		-	-	20	[c]	346
Tamarins	218		3	10	83	[c]	231
Marmosets	402		18	-	43	[c]	420
Owl monkeys	95		1	-	40	[c]	96
Other New World species	102		6	-	12	[c]	108
Total New World primates	1,163		28	10		500	1,201
Total nonhuman primates	4,967		123	98		2,700	5,188

[a] rs = random source (compared with animals reported as nonconditioned in FY 1968 survey).
br = bred for research (compared with animals reported as conditioned in FY 1968 survey).

[b] In FY 1968 survey, numbers of cats were reported as a single unit, and numbers of sheep and goats and numbers of cattle and horses were reported as single units.

[c] In 1968 survey, number of nonhuman primates reported only for total Old World species and total New World species.

TABLE 7b-1. Various Species of Laboratory Animals Acquired by Nonprofit, Commercial, Military, DHEW, and Other Federal Organizations by Sources

Species	No. Acquired from Commercial Sources (FY 1978)				Subtotal	
	Random-bred	Inbred	Hybrid	Other	FY 1968	FY 1978
Rodents						
Mice	4,815,309	2,316,627	1,215,677	436,967	11,415,100	8,784,580
Rats	2,741,160	565,266	30,385	209,457	4,572,000	3,546,268
Hamsters	167,072	136,600	3,080	7,736	403,700	314,488
Guinea pigs	321,295	27,075	2,478	12,694	407,800	363,542
Other rodents	36,522	8,448	18	9,145	26,300	54,133
Total rodents	8,081,358	3,054,016	1,251,638	675,999	16,824,900	13,063,011
Rabbits	380,894	20,566	1,961	13,426	457,900	416,847
Carnivores[a]						
Dogs (rs)	123,457	1,049	1,482	11,307	210,700	137,295
Dogs (br)	29,746	4,636	26	276	36,900	34,684
Cats (rs)	41,284	844	1,219	5,520	95,400[b]	48,867
Cats (br)	1,570	62	-	6		1,638
Other carnivores	3,556	-	-	1,276	7,000	4,832
Total carnivores	199,613	6,591	2,727	18,385	350,000	227,316
Birds	336,600	9,602	8,153	2,697	1,620,100	357,052
Ungulates						
Swine	94,472	53	116	170	14,600	97,811
Sheep	6,114	560	145	182	17,800[b]	7,001
Goats	1,763	3	7	134		1,907
Cattle	22,610	55	147	116	13,200[b]	22,928
Horses	2,106	25	12	63		2,206
Other ungulates	265	-	-	-	200	265
Total ungulates	130,330	696	427	665	46,000	132,118
Nonhuman primates						
Rhesus	6,180		64	7,039	[c]	13,283
Cynomolgus	2,559		-	2,416	[c]	4,975
Stumptails	153		-	1	[c]	154
Other macaques	518		-	61	[c]	579
Baboons	1,164		-	36	[c]	1,200
African green monkeys	499		1	993	[c]	1,493
Chimpanzees	81		-	-	[c]	81
Gibbons	2		-	-	[c]	2
Other Old World species	95		8	-	[c]	103
Total Old World primates	11,251		73	10,546	41,300	21,870
Squirrel monkeys	772		-	183	[c]	955
Tamarins	348		-	-	[c]	348
Marmosets	59		-	24	[c]	83
Owl monkeys	915		-	27	[c]	942
Other New World species	880		-	57	[c]	937
Total New World primates	2,974			291	13,600	3,265
Total nonhuman primates	14,225		73	10,837	54,900	25,135

[a] rs = random source (compared with animals reported as nonconditioned in FY 1968 survey).
br = bred for research (compared with animals reported as conditioned in FY 1968 survey).

[b] In FY 1968 survey, numbers of cats were reported as a single unit, and numbers of sheep and goats and numbers of cattle and horses were reported as single units.

[c] In 1968 survey, number of nonhuman primates reported only for total Old World species and total New World species.

TABLE 7b-2. Total Number of Various Species of Laboratory Animals Acquired by Nonprofit, Commercial, Military, DHEW, and Other Federal Organizations and Percent Acquired from Commercial Sources in FY 1968 and FY 1978

Species	Total Number		% Acquired from Commercial Sources	
	FY 1968	FY 1978	FY 1968	FY 1978
Rodents				
Mice	22,772,400	13,413,813	50	65
Rats	6,131,000	4,358,766	75	81
Hamsters	786,000	368,934	51	85
Guinea pigs	613,100	426,665	67	85
Other rodents	60,500	79,993	43	68
Total rodents	30,363,000	18,648,171	55	70
Rabbits	504,600	439,986	91	95
Carnivores[a]				
Dogs (rs)	212,600	138,437	99	99
Dogs (br)	49,500	44,626	75	78
Cats (rs)	99,200[b]	50,250	96[b]	97
Cats (br)		4,658		35
Other carnivores	9,100	4,990	77	97
Total carnivores	370,400	242,961	94	94
Birds	2,070,300	450,352	78	79
Ungulates				
Swine	53,500	104,769	3	93
Sheep	27,700[b]	10,157	64[b]	69
Goats		2,453		78
Cattle	24,400[b]	24,551	54[b]	93
Horses		2,346		94
Other ungulates	300	319	67	83
Total ungulates	106,100	144,595	43	91
Nonhuman primates				
Rhesus	[c]	15,694	[c]	85
Cynomolgus	[c]	5,274	[c]	94
Stumptails	[c]	281	[c]	55
Other macaques	[c]	1,081	[c]	54
Baboons	[c]	1,631	[c]	74
African green monkeys	[c]	1,546	[c]	97
Chimpanzees	[c]	124	[c]	65
Gibbons	[c]	8	[c]	25
Other Old World species		218		47
Total Old World primates	43,500	25,857	95	85
Squirrel monkeys	[c]	1,301	[c]	73
Tamarins	[c]	579	[c]	60
Marmosets	[c]	503	[c]	17
Owl monkeys	[c]	1,038	[c]	91
Other New World species		1,045		90
Total New World primates	14,100	4,466	96	90
Total nonhuman primates	57,600	30,323	95	83

[a] rs = random source (compared with animals reported as nonconditioned in FY 1968 survey). br = bred for research (compared with animals reported as conditioned in FY 1968 survey).

[b] In FY 1968 survey, numbers of cats were reported as a single unit, and numbers of sheep and goats and numbers of cattle and horses were reported as single units.

[c] In 1968 survey, number of nonhuman primates reported only for total Old World species and total New World species.

TABLE 8. Percentage of Random-bred and Inbred Mice Acquired from Own Breeding by Type of Organization in FY 1978

Type of Organization	Acquired from Own Breeding, %	
	Random-bred	Inbred
Schools		
Medical	49	35
Veterinary	2	64
Universities and colleges	52	73
Other health professional	35	30
Universities with affiliated professional	7	33
Hospitals	33	40
Research institutes and laboratories	80	38
Nonprofit	36	39
Commercial	13	17
Military	82	40
DHEW	96	61
Other Federal	78	52

other Federal organizations, and universities and colleges) acquired most of their random-bred mice from own breeding sources.

Nonprofit biomedical research organizations were asked whether they imported animals from outside the continental United States. This is of concern because the importation of animals may introduce diseases that are not indigenous to the United States or for which there is no effective means of control. Although no attempt was made to determine the number or species of animals imported, frequency of importation, or precautionary measures taken, the number of nonprofit biomedical research organizations (7 percent) importing animals is large enough to be of concern to the scientific community.

COMMENTS AND PROJECTIONS

It was not possible to determine whether the decrease in animal acquisition was absolute or relative. The changes could have resulted from any of the following factors: noncomparability of survey respondents, substantial reduction in breeding colonies maintained for in-house production, and decreases in available funding, available space, and/or ability to comply with current guidelines for housing and care.

It is apparent that there has been a substantial reduction in amount of production breeding from own (in-house) sources. Production breeding is relatively inefficient, with respect to the number of animals that must be maintained compared with the numbers of the proper age, weight, sex, etc., available for research. Therefore, the reduction in acquisition of animals from own breeding colonies may have contributed to a disproportionate reduction in the number of animals acquired.

There have been substantial changes in research methods during the last decade, and they may have affected both the total number and the species of

animals used. For example, shifts from short-term animal studies to longer-term studies, increased awareness of environmental factors that may affect research data, and increases in the kinds of investigation that require containment housing would all tend to reduce the efficiency of space use.

The variations in acquisition, average daily inventory, and average length of stay also indicate a substantial shift from short- to long-term studies. The reduced use of carnivores is believed, by the committee, to be due to an increase in purchase price and difficulty in obtaining quality animals. Both factors have, in turn, been the direct result of legislation that has evolved over the last decade. Although the committee does not believe that there will be a future increase in carnivore use, it is difficult to determine whether it has reached a plateau or whether further decreases will occur. The substantial increase in acquisition of ungulates, especially swine and cattle, is believed by the committee to reflect their suitability for cardiovascular research; and it is likely that many research projects that formerly used dogs are now using these ungulates.

The substantial decrease in the number of nonhuman primates acquired is almost certainly because of their reduced availability and increased cost. The substantial increases in average daily inventory and length of stay suggest that those now available are being conserved for essential long-term studies or breeding colonies.

The overall decrease in acquisition of animals from own breeding sources is believed by the committee to be due to several factors: lack of animal space, cost-effectiveness (i.e., unit cost per animal is higher than for those commercially available), greater variety available from commercial sources,

requirement for uniformity in animals to obtain reproducible results, and ready availability to investigators.

The committee believes that the failure to apply appropriate genetic management principles is a major deficiency in institutions that acquire animals from their own breeding sources. Because some strains are not commercially available, some types of research may require that investigators maintain their own colonies. However, the production of research animals without known genetic background and records is believed by the committee to be a substandard practice that is incompatible with quality research. It is difficult to assess the need for organizations to maintain the relatively large number of breeding colonies of inbred mice, especially in view of the number maintaining genetic records.

The number of nonprofit biomedical research organizations importing animals from outside the continental United States is of concern to the committee. There are, of course, rules governing importation of animals that are designed to protect against disease risks, but the diagnostic procedures available may not routinely detect them. Precautionary steps should be taken in establishing quarantine, in-house testing, and methods of introducing imported animals and biologic materials into a research facility to prevent serious epidemics of disease.

In the next decade, the committee believes that scientists will rely increasingly on commercial sources for animals that are known to be of good quality and defined genetic background. The need for choosing animal models on the basis of their morphologic and disease similarities to man will continue and perhaps emphasize further the need for basic research information on these matters.

FACILITY ADMINISTRATION AND PERSONNEL

CURRENT STATUS

Approximately 82 percent of all responding organizations stated that they were in compliance with the DHEW guidelines for care and use of laboratory animals (table 9). The extent of compliance ranged from 70 percent of DHEW respondents to 95 percent of other health professional schools and hospitals. Approximately 86 percent of the medical school respondents reported that they were in compliance with these guidelines.

A substantial number of respondents stated that they were in compliance with these guidelines as determined by their own institutional committee or on the basis of such miscellaneous standards as "certification by department chairman," "exercise of local supervision," or "state inspection." This could reflect that they have either a high level of institutional concern for humane animal care or a lack of familiarity with the DHEW guidelines.

Approximately 75 percent of the respondents from nonprofit biomedical research organizations reported having one person designated as director for laboratory animal care, compared with 58 percent in FY 1968. The highest percentages, by category of responding organization, were in medical and veterinary medical schools--96 percent and 100 percent, respectively. Approximately 93 percent of the directors for laboratory animal care have a DVM or PhD degree (or both); only 5 percent reported directors with a bachelor's degree.

Approximately 11,000 (9,000 full-time equivalents, or FTE) animal care personnel are currently employed by over 1,000 organizations responding to this

TABLE 9. Percentage of Organizations, by Type, Complying with the Guide for the Care and Use of Laboratory Animals (DHEW Publication No. (NIH) 74-23, Revised 1972)

Type of Organization[a]	In Compliance, %	Method of Compliance, %			
		Institutional Committee (FY 1978)	AAALAC[b] (FY 1978)	Other[c] (FY 1978)	AAALAC, % (FY 1968)
Schools					
Medical	86 (59/69)[d]	29 (20/69)	57 (39/69)	0	39
Veterinary	80 (8/10)	70 (7/10)	10 (1/10)	0	0
Universities and colleges	82 (120/146)	58 (85/146)	16 (23/146)	6 (9/146)	5
Other health professional	95 (40/42)	52 (22/42)	40 (17/42)	2 (1/42)	21
Universities with affiliated professional	89 (67/75)	33 (25/75)	49 (37/75)	1 (1/75)	28
Hospitals	95 (62/65)	35 (23/65)	57 (37/65)	3 (2/65)	11
Research institutes and laboratories	92 (71/77)	47 (36/77)	44 (33/77)	1 (1/77)	12
Nonprofit	78 (748/955)	37 (358/955)	29 (279/955)	10 (92/955)	[e]
Commercial	86 (116/135)	21 (28/135)	47 (63/135)	15 (20/135)	[e]
Military	71 (17/24)	0 (0/24)	46 (11/24)	13 (3/24)	[e]
DHEW	70 (14/20)	35 (7/20)	20 (4/20)	10 (2/20)	[e]
Other Federal	96 (74/77)	18 (14/77)	77 (59/77)	0	[e]
Total	82 (1,396/1,695)	37 (625/1,695)	36 (603/1,695)	8 (131/1,695)	[e]

[a] Some responding organizations indicated compliance without identifying method of compliance. Therefore, there is no correspondence in such cases between the sums of individual methods of compliance and the total number in compliance.

[b] American Association for Accreditation of Laboratory Animal Care.

[c] Number of responding organizations that indicated "other" as basis for compliance.

[d] (Number in compliance/number of respondents).

[e] Data in this category were not collected in FY 1968 survey.

survey question (tables 10 and 11). This represents a 16 percent decrease from the number reported in the FY 1968 survey. The only increase in personnel was in the professional category; "DVM-laboratory animal medicine" showed an 18 percent increase during the 10-year period. The number of animal technicians employed appears to have stabilized, which is in keeping with the nearly constant average daily inventory of animals (tables 5a and 5b). The percentage FTE of personnel employed varied from a low of 58 percent for "other doctorates" to a high of 85 percent for "animal technicians" and "specialized support" (table 11).

Organizations that responded to the survey indicated both current and future needs (tables 12a and 12b). The respondents stated that the greatest needs, in order of priority, were, for professional personnel, veterinarians trained in laboratory animal medicine, persons with other doctorates, and veterinarians trained in pathology; and for other personnel, animal technicians, specialized support personnel, and administrative personnel (table 12b). The priority of personnel needs was similar among nonprofit biomedical research organizations, except for professional personnel, in which case there is a greater need for veterinarians trained in pathology than for persons with other doctorates (table 12a).

COMMENTS AND PROJECTIONS

The committee was surprised by the extent of acknowledged noncompliance with the DHEW guidelines for care and use of laboratory animal facilities, especially among DHEW respondents. Obviously, this is a matter of concern to most granting agencies in evaluating requests for research funds. Perhaps the basis for this noncompliance needs further evaluation. Unrealistic expectations, insufficient funding, inadequate knowledge of the guidelines, or misinterpretation

TABLE 10. Number of Full- and Part-Time Personnel Employed by All Responding Institutions and Organizations in Some Aspect of Laboratory Animal Care (FY 1978)

Category of Personnel	No. Employed FY 1968	No. Employed FY 1978	Net Change No.	Net Change %
Professional				
DVM-laboratory animal medicine	547	644	+ 97	+18
DVM-pathology	208	214	+ 6	+ 3
Other doctorates[a]	1,237	688	- 549	-44
Subtotal	1,992	1,546	- 446	-22
Support				
Specialized[b]	1,393	1,324	- 69	- 5
Animal technicians	8,165	6,989	-1,176	-14
Administrative personnel[c]	1,831	1,412	- 419	-23
Subtotal	11,389	9,725	-1,664	-15
Total personnel	13,381	11,271	-2,110	-16

[a] Includes MD, DDS, PhD, and DVM with specialty training other than laboratory animal medicine or pathology.

[b] Includes x-ray technicians, medical technicians, and operating-room personnel.

[c] Includes facility director (if not included in another category), business manager, accountant, secretaries, etc.

TABLE 11. Relationship between Number and Full-Time Equivalent of Personnel Currently Employed by All Responding Organizations in Some Aspect of Laboratory Animal Care (FY 1978)

Category of Personnel	No.	FTE	% FTE of Number
Professional			
DVM-laboratory animal medicine	644	397.4	62
DVM-pathology	214	128.5	60
Other doctorates[a]	688	401.2	57
Support			
Specialized[b]	1,324	1,124.1	85
Animal technicians	6,989	5,950.1	85
Administrative personnel[c]	1,412	1,055.7	75
Total personnel	11,271	9,057.0	80

[a]Includes MD, DDS, PhD, and DVM with specialty training other than laboratory animal medicine or pathology.

[b]Includes x-ray technicians, medical technicians, and operating-room personnel.

[c]Includes facility director (if not included in another category), business manager, accountant, secretaries, etc.

TABLE 12a. Personnel Needs (FTE) by Category and Type of Nonprofit Biomedical Research Organization in FY 1978

Category of Personnel	Schools							
	Medical	Veterinary	Universities and Colleges	Other Health Professional	Universities with Affiliated Professional	Hospitals	Research Institutes and Laboratories	Total
DVM-Laboratory Animal Medicine								
Currently employed	74.6	8.7	22.6	4.6	63.1	12.9	30.4	216.9
Unfilled needs								
Funded	11.3	2.0	3.2	0.1	4.1	0.4	3.0	24.1
Not funded	13.2	0.5	3.1	0.8	9.0	3.0	1.5	31.1
Est. addl. need 1983	34.5	8.3	18.2	4.9	34.8	8.3	13.1	122.1
DVM-Pathology								
Currently employed	20.4	4.5	3.9	1.5	14.4	0.6	10.0	55.3
Unfilled needs								
Funded	2.9		2.9		3.0	0.1	2.4	11.3
Not funded	6.0	3.0	6.0	1.2	4.6	1.0	1.0	22.8
Est. addl. need 1983	25.6	2.5	12.7	0.4	18.3	1.7	12.3	73.5
Other doctorates								
Currently employed	15.5	1.3	51.3	8.2	15.3	36.1	32.8	160.5
Unfilled needs								
Funded	1.0		1.8	1.1	0.1	2.3	7.0	13.3
Not funded	1.0	2.0	4.5	0.1	2.0	2.0	3.0	14.6
Est. addl. need 1983	11.7	2.0	19.4	5.3	10.1	5.2	9.3	63.0
Special support personnel								
Currently employed	131.8	2.7	66.3	5.5	100.1	56.0	91.5	453.9
Unfilled needs								
Funded	17.9	1.0	3.5		4.0		3.4	29.8
Not funded	14.6	2.5	8.3		7.2	2.1	5.2	39.9
Est. addl. need 1983	74.5	11.5	41.5	7.2	63.9	22.9	35.6	257.1
Animal technicians								
Currently employed	893.4	92.7	372.5	70.7	778.8	167.8	570.9	2,946.8
Unfilled needs								
Funded	29.5	5.0	27.2	3.5	17.8	5.0	53.7	141.7
Not funded	65.0	7.0	53.3	7.2	25.6	10.7	22.1	190.9
Est. addl. need 1983	242.8	57.0	200.3	43.0	230.4	67.9	128.3	969.7
Administrative personnel								
Currently employed	180.9	19.7	55.7	12.9	138.6	43.3	69.8	520.9
Unfilled needs								
Funded	12.0		2.8	0.5	8.1		3.2	26.6
Not funded	12.2	6.0	10.2	0.5	7.6	6.2	5.7	48.4
Est. addl. need 1983	60.5	14.5	33.7	10.9	55.3	15.4	28.3	218.6

TABLE 12b. Personnel Needs (FTE) by Category and Type of Organization in FY 1978

Personnel by Category	Nonprofit	Commercial	Military	DHEW	Other Federal Organizations	Total
DVM-Laboratory Animal Medicine						
Currently employed	258.6	70.7	36.4	12.5	19.2	397.4
Unfilled needs						
Funded	29.7	6.6	2.2	4.0	0.6	43.1
Not funded	38.2	5.9			5.5	49.6
Est. addl. need 1983	153.4	40.8	5.0	4.5	15.4	219.1
DVM-Pathology						
Currently employed	62.9	38.7	14.9	11.8	0.2	128.5
Unfilled needs						
Funded	13.8	13.9	1.0	6.8	1.0	36.5
Not funded	30.0	4.8	1.1	0.5	0.3	36.7
Est. addl. need 1983	85.7	36.3	4.1	4.0	1.3	131.4
Other doctorates						
Currently employed	246.6	132.4	16.3	0.6	5.3	401.2
Unfilled needs						
Funded	16.9	12.2	3.0			32.1
Not funded	21.7	13.0	1.1		0.3	36.1
Est. addl. need 1983	90.5	72.6	6.1		4.0	173.2
Special support personnel						
Currently employed	513.1	392.4	127.8	29.1	61.7	1,124.1
Unfilled needs						
Funded	36.8	19.0	7.0	7.0	5.0	74.8
Not funded	55.8	19.5	9.0	2.0	6.0	92.3
Est. addl. need 1983	291.6	240.9	18.8	4.1	37.0	592.4
Animal technicians						
Currently employed	3,559.8	1,483.5	227.7	298.1	381.0	5,950.1
Unfilled needs						
Funded	168.5	49.5	15.0	74.0	14.0	321.0
Not funded	242.4	36.3	2.5		14.5	295.7
Est. addl. need 1983	1,194.3	485.5	19.5	95.1	110.0	1,904.4
Administrative personnel						
Currently employed	664.5	279.2	41.9	17.6	52.5	1,055.7
Unfilled needs						
Funded	33.2	8.0	2.0	2.0	3.0	48.2
Not funded	55.1	13.8	3.0		2.0	73.9
Est. addl. need 1983	266.9	123.1	14.1	5.0	20.0	429.1

of the questionnaire may explain the apparent high level of noncompliance by some types of organizations.

It is surprising that there has not been a greater increase, during the last decade, in the number of nonprofit organizations achieving peer evaluation of compliance, i.e., accreditation by the American Association for Accreditation of Laboratory Animal Care. Whatever the reasons, it is clear that the relatively high number of organizations (over 370) planning to apply for accreditation at the time of the FY 1968 survey did not, or could not, achieve that status by FY 1978. It is also interesting that 603 organizations reported that they had achieved AAALAC accreditation, whereas AAALAC records indicate that only 378 organizations were accredited at the time of the FY 1978 survey. Reasons for this discrepancy are not known.

Personnel changes during the last decade reflect, primarily, an emphasis on quality care--i.e., an increase in veterinarians trained in laboratory animal medicine. This trend is expected to continue at least through the next decade. The greatest need appears to be for veterinarians trained in laboratory animal medicine. The respondents indicated substantial needs in all personnel categories, even though there has been an apparent decrease in the number employed during the last decade. The relationship between the number and FTE of personnel currently employed suggests substantial involvement in activities other than service, especially for professional personnel. It is assumed that the remaining percentage of effort for professional personnel is spent in teaching and research activities, whereas for support personnel it is most likely devoted to research activities. However, it does emphasize that the total personnel needs are in excess of those FTE required only for animal care activities.

FACILITIES AND EQUIPMENT

CURRENT STATUS

Nonprofit biomedical research organizations reported having a total of approximately 10 million net square feet of laboratory animal facility space in use or under construction in FY 1978 (table 13). This represents an increase of approximately 2.5 million nsf over the space reported in the FY 1968 survey.

There has been a substantial increase (105 percent) in the median nsf of laboratory animal facility space, compared with a modest increase (27 percent) in total nsf in nonprofit biomedical research organizations (table 13). There appears to have been a decrease in the existence of centralized facilities in the last decade (table 14). These changes may reflect reorganization by category, actual changes in which organizations responded to the surveys, or the committee's decision to use data only from organizations with annual research budgets of at least $5,000.

Animal facility space use is devoted primarily to biomedical research activities; the median was approximately 70 percent (table 15). This is similar to that reported in FY 1968. There appeared to be a positive relationship between the percentage of space and the percentage of animals, by use, in all respondent categories. However, only a small amount of space was attributed to use for breeding purposes, even though substantial numbers of animals were acquired from own breeding programs (table 7a). It was not possible to determine whether this was a relative or absolute discrepancy in assessment of space use.

TABLE 13. Net Square Feet of Laboratory Animal Facility Space in Use or Under Construction in Nonprofit Biomedical Research Organizations (FY 1968 and FY 1978)

Type of Organization	Median Net Square Feet			Total Net Square Feet		
	FY 1968[a]	FY 1978	Net Change, %	FY 1968[a]	FY 1978	Net Change, %
Schools						
Medical	19,200 (55)[b]	22,000 (69)	+ 15	1,465,804 (55)	2,133,720 (69)	+ 46
Veterinary	16,100 (10)	32,934 (9)	+105	429,174 (10)	398,933 (9)	- 7
Universities and colleges	1,200 (255)	2,034 (147)	+ 70	1,742,694 (255)	1,109,203 (147)	- 36
Other health professional	1,900 (89)	2,205 (42)	+ 16	621,631 (89)	142,324 (42)	- 77
Universities with affiliated professional	32,600 (22)	17,700 (74)	- 46	1,594,176 (22)	3,231,712 (74)	+103
Hospitals	2,300 (138)	3,737 (64)	+ 62	597,810 (138)	306,656 (64)	- 49
Research institutes and laboratories	4,400 (93)	4,541 (76)	+ 3	1,147,465 (93)	2,308,997 (76)	+101
Total	2,500 (662)	5,126 (481)	+105	7,598,754 (662)	9,631,545 (481)	+ 27

[a] These values were secured from the unpublished results of the FY 1968 survey, and are rounded off to the nearest 100.

[b] Numbers in parentheses are the number of reporting organizations.

Table 14. Percentage of Nonprofit Biomedical Research Organizations with Animal Facility Housed in a Single Location in FY 1968 and FY 1978

Type of Organization	Organizations	
	FY 1968	FY 1978
Schools		
Medical	36 (20/55)[a]	32 (22/69)
Veterinary	9 (1/11)	0 (0/10)
Universities and colleges	44 (114/262)	36 (54/148)
Other health professional	68 (63/92)	88 (37/42)
Universities with affiliated professional	9 (2/22)	16 (12/76)
Hospitals	72 (107/148)	78 (50/64)
Research institutes and laboratories	63 (59/93)	79 (53/67)
Total	54 (366/683)	48 (228/476)

[a] Numbers in parentheses = numbers of organizations reporting single physical location/total numbers of respondents.

TABLE 15. Percentage Use of Animal Facility Space by Purpose and Type of Nonprofit Biomedical Research Organization in FY 1978

Type of Organization	Biomedical Research, %		Teaching, %		Breeding, %		Diag. & Testing, %	
	Space	Animals	Space	Animals	Space	Animals	Space	Animals
Schools								
Medical	80[a] (66/67)[b]	84 (65/66)	5 (61/67)	5 (61/66)	1 (38/67)	1 (39/66)	1 (38/67)	0 (28/66)
Veterinary	60 (9/9)	54 (9/9)	30 (8/9)	40 (8/9)	0 (4/9)	0 (4/9)	2 (6/9)	2 (6/9)
Universities and colleges	50 (141/144)	53 (141/144)	30 (133/144)	28 (134/144)	0 (40/144)	0 (38/144)	0 (24/144)	0 (23/144)
Other health professional	69 (40/42)	70 (38/40)	20 (31/42)	15 (31/40)	0 (10/42)	0 (8/40)	0 (5/42)	0 (3/48)
Universities with affiliated professional	70 (69/72)	70 (69/73)	15 (66/72)	10 (66/73)	0 (29/72)	0 (30/73)	0 (28/72)	0 (28/73)
Hospitals	90 (62/64)	92 (59/61)	1 (32/64)	1 (31/61)	0 (12/64)	0 (11/61)	0 (10/64)	0 (9/61)
Research institutes and laboratories	95 (73/77)	98 (72/77)	0 (8/77)	0 (15/77)	0 (19/77)	0 (18/77)	0 (12/77)	0 (9/77)
Total	70 (463/475)	75 (456/470)	10 (352/475)	10 (349/470)	0 (153/475)	0 (149/470)	0 (125/475)	0 (102/470)

[a] 50th percentile.

[b] (Number of organizations reporting some use/total number of respondents.)

Approximately 16 percent of all nonprofit biomedical research organizations reported a need to replace some animal facility space now in use (table 16), 38 percent reported a need for remodeling to protect the integrity of space now in use, and 47 percent reported a current need for additional space. There was considerable variation in remodeling cost estimates, suggesting a range of improvement needs from minor efforts, such as painting, to major renovation. The greatest needs for replacement, remodeling, and additional space were for class A animal rooms (table 17). Other substantial needs included containment for research involving biohazardous agents, space related to quality of animal care (i.e., service areas), and space for ancillary professional services.

Approximately $350 million is required to meet current needs for space replacement, remodeling, and additions (table 18). Another $407 million (using FY 1978 estimated construction costs) will be required to meet space needs projected for FY 1988. Replacement, remodeling, and construction costs were estimated by using nsf costs of Federal Government construction projects initiated during 1972-1979 as a guide (National Cancer Institute, Construction Data, 1972-1979, Research Facilities Branch, Division of Cancer Research Resources and Centers; Future Funding Needs for the Improvement of Animal Facilities, September 18, 1978, National Cancer Institute, Research Facilities Branch, Division of Cancer Research Resources and Centers). Although there may be some variation in such costs within a region of the continental United States, there do not appear to be significant variations between regions.

These cost estimates are:

Type of Animal Space	Cost/nsf, $ New Construction	Remodeling [g]
Class A [a]	200	50
Class B [b]	100	35
Class C [c]	50	25
Class D [d]	250	50
Animal service areas [e]	100	50
Ancillary professional services [f]	250	75

---

[a] Completely enclosed animal rooms with environmental controls.

[b] Combination indoor-outdoor housing and restricted exercise areas, such as kennels with runs and indoor-outdoor primate facilities (includes both indoor and outdoor space).

[c] Shelters with no environmental controls (e.g., barns, open sheds, etc.).

[d] Biohazard containment for microbiologic agent, radioisotope agent, chemical/toxic agent, or quarantine for newly received animals.

[e] Cage washing and sterilization, receipt and processing, storage, office space, and incinerator or protected area for refuse.

[f] X-ray facilities, diagnostic laboratory, necropsy, and surgery.

[g] Remodeling estimates approximated the 50th percentile figure quoted by respondents. It is obvious that this figure represents a wide range from minimal painting to complete renovation of facilities.

The costs are substantial, but the estimated needs projected in the FY 1968 survey proved to be reasonably accurate (table 19), with respect to what was needed in FY 1968, what was built in the last decade, and what was needed in FY 1978.

TABLE 16. Percentage of Nonprofit Biomedical Research Organizations with Animal Facility Space Needs (FY 1978)

Type of Organization	Some Current Space Needs		Need Some Additional Space Now
	Replacement	Remodeling	
Schools			
Medical	7	49	62
Veterinary	50	70	80
Universities and colleges	15	37	47
Other health professional	7	24	36
Universities with affiliated professional	22	53	58
Hospitals	6	19	30
Research institutes and laboratories	13	38	39
Total	16	38	47

TABLE 17. Types of Animal Facility Space Needs in Nonprofit Biomedical Research Organization (FY 1978)

Type of Space[a]	Needs Replacement, %	Needs Remodeling, %	Additional Current Needs, %
Class A[b]	12	31	38
Class B[c]	2	7	9
Class C[d]	2	5	8
Class D[e]			
Microbiologic agent	2	2	15
Radioisotope agent	1	1	10
Chemical/toxic agent	1	1	10
Quarantine for newly received animals	1	4	17
Animal service areas[f]	4	16	26
Ancillary professional services[g]	2	7	17

[a] Same as footnote for question 14, page 13 of survey questionnaire (See appendix).

[b] Completely enclosed animal rooms with environmental controls.

[c] Combination indoor-outdoor housing and restricted exercise areas, such as kennels with runs, indoor-outdoor primate facility (includes both indoor and outdoor space).

[d] Shelters with no environmental controls (e.g., barns, open sheds, etc.).

[e] Biohazard containment.

[f] Cage washing and sterilization, receipt and processing, storage, office space, and incinerator or protected area for refuse.

[g] X-ray facilities, diagnostic laboratory, necropsy, and surgery.

TABLE 18. Total Net Square Feet of Animal Facility Space in Use; Needs Replacement or Remodeling; Current and Future Additional Needs by Type of Nonprofit Biomedical Research Organization in FY 1978

Current Status of Animal Facility Space	Schools					Hospitals	Research Institutes and Laboratories	Total
	Medical	Veterinary	Universities and Colleges	Other Health Professional	Universities with Affiliated Professional			
In Use--FY 1978	2,133,720	398,933	1,109,203	142,324	3,231,712	306,656	2,308,997	9,631,545
In Use--needs replacement								
Net square feet	74,075	11,988	47,776	3,390	77,051	25,145	28,382	267,807
% of current space	3	3	4	2	2	8	1	3
Est. replacement cost, $	13,561,650	1,664,750	9,130,200	642,000	13,017,750	3,329,000	4,516,750	45,862,100
In Use--needs remodeling								
Net square feet	201,025	43,973	160,069	21,736	434,567	34,860	123,360	1,019,590
% of current space	9	11	14	15	13	11	5	11
Est. remodeling costs, $	9,684,920	2,262,755	7,513,005	1,004,200	18,884,355	1,609,725	5,692,760	46,651,720
Current addl. needs								
Net square feet	416,016	71,970	237,853	28,178	412,111	65,140	216,031	1,447,299
% of current space	19	18	21	20	13	21	9	15
Est. construction costs, $	72,855,800	13,638,500	38,313,850	5,467,300	74,637,500	11,563,250	36,942,800	253,419,000
Total cost to meet current needs ($)	96,102,370	17,566,005	54,957,055	7,113,500	106,539,605	16,501,975	47,152,310	345,932,820
Addl needs--FY 1988								
Net square feet	745,073	124,550	276,194	96,750	742,397	68,991	361,512	2,415,467
Est. construction costs, $	121,338,000	20,975,000	50,102,400	18,394,350	128,250,050	12,985,450	54,525,500	406,570,750

TABLE 19 Additional Animal Space Needed in FY 1968, Change Between FY 1968 and FY 1978 in Space Used, and Additional Animal Space Needed in FY 1978 in Nonprofit Biomedical Research Organizations

Type of Organization	Median Net Square Feet[a]		
	Additional Needs Reported in FY 1968	Change in 10-Yr Period (from FY 1968-1978)	Additional Needs Remaining in FY 1978[b]
Schools			
Medical	9,800 (42)	+2,800 (69)	5,500 (43)
Veterinary	[c] (8)	-	7,250 (8)
Universities and colleges	1,700 (161)	+ 834 (147)	1,250 (69)
Other health professional	1,800 (65)	+ 305 (42)	2,000 (15)
Universities with affiliated professional	27,300 (20)	-9,600 (74)	4,000 (43)
Hospitals	2,000 (62)	+1,737 (64)	1,200 (19)
Research institutes and laboratories	2,500 (46)	+2,041 (76)	3,016 (30)
Total	2,200 (404)	+2,926 (472)	2,521 (227)

[a] Numbers in parentheses are numbers of responding organizations.

[b] Median additional net square feet for 1978 may be overestimated, because it is unknown whether no response means zero need or only incomplete answer.

[c] Number of cases too small for median to be reliable.

Nonprofit biomedical research organizations reported a current need of $43 million for equipment renovation, replacement, or additions (table 20). Seventy-two percent of all respondents reported the availability of cage and rack washing machines, up from 53 percent in the FY 1968 survey. However, approximately $7.5 million is still required to meet current needs. The availability of surgical equipment has remained almost the same (68 percent in FY 1968 and 76 percent in FY 1978), as has the availability of x-ray equipment (39 percent in FY 1968 and 40 percent in FY 1978). The additional needs for x-ray equipment, approximately $3.9 million in estimated cost, appear to reflect needs for both diagnostic radiology and experimental irradiation equipment. Approximately 55 percent reported the availability of diagnostic equipment (compared with 42 percent in FY 1968). Biohazard control equipment needs were estimated at $8.9 million.

COMMENTS AND PROJECTIONS

Approximately 10 million nsf of animal facility space, with an estimated replacement value of $1.4 billion, is in use at nonprofit biomedical research organizations. However, these organizations reported a current need of $350 million for replacement, remodeling, and addition of space. In general, these needs appear to be based on the requirements for containment of hazardous agents or for improvement in the quality of animal care. Approximately $43 million is required for renovation, replacement, or addition of equipment. It is surmised that the failure to acquire space and equipment may have been a factor in some organizations' reports of inability to comply with the DHEW guidelines for animal care. If that is true, it emphasizes the crucial need for the replacement, remodeling, construction, and equipping of laboratory animal facility space.

TABLE 20. Estimated Costs for Current Equipment Repair, Replacement, or Additional Purchase by Type of Nonprofit Biomedical Research Organization

Equipment Categories	Schools					Hospitals	Research Institutes and Laboratories	Total
	Medical	Veterinary	Universities and Colleges	Other Health Professional	Universities with Affiliated Professional			
Machine cage and rack washing								
Number organizations available[a]	67	9	83	31	62	47	51	350
Needed								
Number of organizations	34	4	79	16	50	23	31	237
Total cost ($)	1,354,270	327,000	1,790,298	225,050	2,155,400	381,486	1,281,595	7,515,098
Surgical equipment								
Number organizations available	61	6	101	33	63	51	55	370
Needed								
Number of organizations	30	5	49	14	37	21	18	174
Total cost ($)	361,421	95,500	312,850	144,500	634,700	298,942	92,300	1,940,213
X-ray equipment								
Number organizations available	42	7	28	17	39	35	24	192
Needed								
Number of organizations	29	4	15	6	24	15	15	108
Total cost ($)	1,351,100	151,000	144,700	49,000	819,500	899,500	497,000	3,911,800
Diagnostic lab equipment								
Number organizations available	57	7	54	21	50	42	36	267
Needed								
Number of organizations	38	2	37	10	35	14	20	156
Total cost ($)	445,395	205,000	544,950	124,000	579,857	191,700	247,000	2,337,902
Biohazard control equipment								
Number organizations available	29	2	48	17	42	19	37	194
Needed								
Number of organizations	46	7	46	10	49	12	17	187
Total cost ($)	2,348,000	469,000	1,384,800	124,500	2,697,500	379,600	1,528,200	8,931,600
Cages								
Number organizations available	66	7	130	38	73	60	71	445
Needed								
Number of organizations	51	8	93	23	55	23	33	286
Total cost ($)	2,782,425	458,500	2,072,485	302,000	2,413,466	641,328	1,396,200	10,066,404
Emergency power equipment								
Number organizations available	36	4	47	16	34	33	40	210
Needed								
Number of organizations	18	3	33	8	25	4	16	107
Total cost ($)	1,152,500	152,000	716,100	97,200	450,700	118,000	1,720,250	4,406,750
Other animal-related equipment								
Number organizations available	44	4	61	20	43	26	45	243
Needed								
Number of organizations	29	4	66	14	41	15	29	198
Total cost ($)	783,000	332,000	1,109,350	142,000	1,007,700	330,715	590,200	4,294,965
Total equipment needs								
Number of organizations	61	10	110	29	67	39	46	362
Total cost ($)	10,578,111	2,190,000	8,075,533	1,208,250	10,758,823	3,241,271	7,352,745	43,404,733

[a] Number organizations available = number of organizations in which equipment is available.

The lack of an increase in the existence of centralized facilities in the last decade is not surprising, inasmuch as the available construction funds during this period appeared to permit only slight expansion. In general, it appears that respondents with smaller numbers of animals and narrower research goals had a greater tendency toward centralization--i.e., other health professional schools, hospitals, and research institutes and laboratories. This suggests that decisions on centralization of space were formerly based on size or investigator preference, instead of operational efficiency.

The committee believes that biohazard containment space and equipment needs reflect changes in research activities, as well as an awareness in the biomedical research community of the need to contain hazardous agents. It is recognized that not all organizations are engaged in research with hazardous agents, but the substantial needs reported suggest that there should be priority funding for fulfilling these needs.

The increase in the availability of diagnostic laboratory equipment and the current needs reflect an awareness of the importance of diagnostic laboratory support as an aid in providing high-quality animal care and increasing the reliability of research data, especially in long-term studies.

Most of the respondents reported availability of cages. It is assumed that the majority of estimated funds needed in this category are for replacement. It is further assumed that this will be a continuing cost, as opposed to a one-time expenditure, although at a lower annual rate. However, increased cage size requirements may result in a need for replacement of small with larger cages for some species.

COSTS OF ANIMAL CARE

CURRENT STATUS

Nonprofit biomedical research organizations reported expenditures of approximately $2.2 billion for biomedical research in FY 1978 (table 21). This represents a substantial increase (28 percent), when corrected for inflation, over expenditures reported in FY 1968. Approximately $800 million (a 1 percent increase over adjusted FY 1968) of this amount was for research projects involving the use of some laboratory animals, of which approximately $571 million (a 7 percent increase over adjusted FY 1968) was furnished by grants and contracts from the NIH.

Approximately 35 percent of the total biomedical research budget is for research projects involving the use of laboratory animals (table 22). Most respondents in this category were in the range 28-43 percent (for veterinary schools, the figure was 88 percent). This is an apparent decrease from the 44 percent reported in FY 1968; the decrease suggests that other aspects of research are increasing in cost at a slightly greater rate than animal care. In fact, total animal care costs reported for FY 1978 were only 1 percent higher than those for FY 1968 (table 23); in spite of this lack of overall change in animal care costs, there were substantial changes among categories. Universities and colleges, other health professional schools, and hospitals respondents showed substantial decreases, whereas most of the others reported modest increases. The substantial increases for veterinary schools and universities with affiliated

TABLE 21. Biomedical Research Expenditures by Survey Respondents in FY 1968 and FY 1978 (in thousands of dollars)

	All Biomedical Research Expenditures	Research Expenditures Involving Laboratory Animals	NIH Support of Research Expenditures Involving Laboratory Animals
FY 1968	920,418	407,935	276,261
FY 1968 adjusted to FY 1978 purchasing power[a]	1,776,869	787,519	533,322
FY 1978	2,268,818	797,095	570,659
Net change			
Amount	491,949	9,576	37,337
%	+28	+1	+7

[a] $\frac{\text{FY 1968 amount}}{0.518}$ = adjustment to CPI, 1978 (Office of Consumer Price Index, Bureau of Labor Statistics, U.S. Department of Commerce).

TABLE 22. Percentage of Total Nonprofit Biomedical Research Budget for Projects Involving Some Use of Animals, and Percentage of Animal Projects Funded by NIH (FY 1978)

Type of Organization	Nonprofit Biomedical Research Budget[a], in $1000s	% of Budget Using Animals	% of Budget Funded by NIH
Schools			
Medical	781,661 (69)[b]	37	81
Veterinary	18,390 (10)	88	43
Universities and colleges	164,324 (149)	37	61
Other health professional	24,075 (42)	28	62
Universities with affiliated professional	910,200 (76)	29	75
Hospitals	104,396 (65)	43	62
Research institutes and laboratories	265,772 (78)	43	53
Total	2,268,818 (489)	35	72

[a] Direct plus indirect costs.

[b] Numbers in parentheses are numbers of respondents in category.

TABLE 23. Animal Care Costs[a] by Type of Nonprofit Biomedical Research Organization

	Schools							
	Medical	Veterinary	Universities and Colleges	Other Health Professional	Universities with Affiliated Professional	Hospitals	Research Institutes and Laboratories	Total
Median--FY 1968, $	149,700	*b*	5,400	12,600	221,600	22,500	48,800	19,100
Adjusted to 1978 by CPI, $[c]	288,996	-	10,425	24,324	427,799	43,436	94,208	36,873
Median--FY 1978, $	390,000	215,021	19,145	28,000	190,546	56,347	71,812	58,163
Net change								
$	101,004	-	8,720	3,676	-237,253	12,911	-22,396	21,290
%	35	-	84	15	-55	30	-24	58
Total--1968, $	12,295,000	440,500	9,440,800	5,269,300	8,361,400	4,954,200	9,364,400	50,125,600
Adjusted to 1978 by CPI, $	23,735,521	849,421	18,225,482	10,172,393	16,141,698	9,564,093	18,077,992	96,767,567
Total--FY 1978, $	31,642,000	2,233,000	8,782,000	1,725,000	26,085,000	6,138,000	21,110,000	97,715,000
Net change								
$	7,906,479	1,383,579	-9,443,482	-8,447,393	9,943,302	-3,426,093	3,032,008	947,433
%	33	163	-52	-83	62	-36	17	1

[a] Costs include those for personnel, supplies, animal purchases, and equipment.

[b] Too few cases for computation to be meaningful.

[c] $\frac{\text{1968 median}}{0.518}$ = adjustment to CPI, 1978 (U.S. Department of Commerce, Bureau of Labor Statistics, Office of Consumer Price Index).

professional schools are believed to be relative; they probably reflect some change in categorization between the FY 1968 and FY 1978 surveys.

The distribution of animal care costs by budget item is shown in table 24. In general, personnel costs accounted for 58 percent of the total cost of animal care--a slight increase from the 52 percent reported in FY 1968. There did not appear to be any substantial variation in percentage of budget items between categories of respondents.

Total animal care costs are recovered, in part, by the assessment of user fees, including per diem charges. However, there seems to be extreme variation in how these charges are determined and in whether they accurately reflect the cost of services. Only 56 percent of all biomedical research organizations recover 50 percent or more of their total animal care costs from user fees--a decrease from 70 percent in FY 1968 (table 25).

Median per diem rates for selected species of laboratory animals, by category of respondents, are shown in table 26. There is marked variation in the rates, suggesting that they are not intended to recover the total or even the same costs or that the bases for cost-accounting procedures are different. Variations in cost did not appear to exist in different geographic locations in the country. This is further emphasized by the wide range of per diem rates used by all responding organizations (table 27). There appeared to be little or no relationship between per diem rates and the percentage of cost recovery (table 28). It could not be determined whether this reflected operational efficiency (i.e., the pressure to recover costs increased efficiency) or inadequate cost-accounting. Other factors affecting efficiency include centralization of space and management. Although approximately 61 percent of the biomedical research organizations now have centralized management

TABLE 24. Total Animal Care Costs (in Thousands of Dollars) and Percentages by Budget Item and Type of Nonprofit Biomedical Research Organization in FY 1978

	Schools																	
Budget Item	Medical	%	Veterinary	%	Universities and Colleges	%	Other Health Professional	%	Universities with Affiliated Professional	%	Hospitals	%	Research Institutes and Laboratories	%	Total	%	(FY'68)
Personnel																	
Professional	3,018	10	197	10	764	11	240	14	2,371	9	458	9	1,642	11	8,690	10	
Specialized support	1,525	5	72	4	627	9	43	3	1,242	5	327	7	1,048	7	884	6	
Animal technicians	9,525	32	696	34	2,571	36	574	34	8,332	33	2,003	41	4,909	34	28,610	34	
Administrative	2,143	7	176	9	467	7	110	6	2,421	9	256	5	722	5	6,295	7	
Subtotal[a]	16,207	55	1,143	57	4,428	62	964	57	14,713	58	3,050	62	8,538	59	49,043	58	(51.5)
Supplies																	
Food	1,846	6	284	14	725	10	104	6	1,594	6	298	6	887	6	5,738	7	
Bedding	641	2	75	4	237	3	39	2	653	3	128	3	238	2	2,011	2	
Other	1,868	6	71	4	268	4	143	8	1,232	5	174	4	798	6	4,554	5	
Subtotal[a]	4,531	15	430	21	1,289	18	297	18	3,741	15	760	16	2,829	20	13,877	16	
Services	1,193	4	67	3	170	2	28	2	758	3	118	2	485	3	2,819	3	(20.6)
Animal purchases	5,896	20	256	13	763	11	221	13	4,023	16	658	13	1,642	11	13,459	16	(16.9)
Cages & equipment	1,678	6	124	6	477	7	185	11	2,330	9	295	6	894	6	5,983	7	(6.7)
Total direct costs	29,505		2,020		7,127		1,695		25,565		4,881		14,388		85,181		

[a]Subtotals are not the sums of the costs of budget items because some of budget items were rounded off in the computer; rounding was not done in the case of sums, i.e., total direct costs for each organization.

TABLE 25. Median Percentile of Animal Care Costs Derived From User Fees for FY 1968 and FY 1978 by Types of Nonprofit Biomedical Research Organizations

Type of Organization	Percentile for 1968			Percentile for 1978		
	10th	50th (Median)[a]	90th	10th	50th (Median)[a]	90th
Schools						
Medical	30	75	100	22	70	100
Veterinary	[b]	[b]	[b]	9	48	78
Universities and colleges	10	60	100	5	49	100
Other health professional	20.6	67	100	2	25	100
Universities with affiliated professional	7.9	60	90.9	15	56	94
Hospitals	20	75	100	9	50	100
Research institutes and laboratories	3.9	79.5	100	15	61	100
Total	15	70	100	14	56	100

[a] Report of FY 1968 survey listed means. Medians were computed in FY 1968 survey, but not included in report. The data in this column were derived from the unpublished results of the FY 1968 survey.

[b] Numbers are so small that percentiles are not meaningful.

TABLE 26. Median Per Diem Rates (Dollars) for Selected Species of Animals by Type of Enclosure and Type of Nonprofit Biomedical Research Organization in FY 1978

	Schools							Total - All Organizations		
								Percentile		
	Medical	Veterinary	Universities and Colleges	Other Health Professional	Universities with Affiliated Professional	Hospitals	Research Institutes and Laboratories	10th	50th	90th
Mice - individual	0.040	0.030	0.030	0.040	0.040	0.038	0.030	0.016	0.039	0.090
Mice - group	0.080	--	0.125	--	0.180	--	0.300	0.021	0.120	0.445
Rats - individual	0.084	0.060	0.070	0.060	0.090	0.100	0.100	0.040	0.084	0.170
Rats - group	0.115	--	0.093	--	0.246	--	0.400	0.036	0.125	0.545
Hamsters - individual	0.080	0.050	0.075	0.150	0.090	0.130	0.091	0.041	0.080	0.188
Hamsters - group	0.095	--	--	--	0.180	--	--	0.041	0.150	0.450
Guinea pigs - individual	0.210	0.120	0.150	0.150	0.200	0.177	0.170	0.100	0.190	0.330
Guinea pigs - group	0.247	--	--	--	0.190	--	--	0.100	0.247	0.949
Dogs (random source) indiv.	1.450	1.100	1.470	1.600	1.300	1.750	2.000	0.654	1.485	2.500
Dogs (random source) group	1.050	--	--	--	1.780	--	--	0.775	1.810	3.491
Cats (random source) indiv.	0.850	0.700	0.800	0.720	0.770	0.975	1.440	0.410	0.850	1.600
Cats (random source) group	--	--	--	--	1.000	--	--	0.455	0.905	2.145

TABLE 27. Range and Percentile Distribution of Per Diem Charges (Dollars) for Animal Care by Species in All Responding Organizations (FY 1978)

Species[a]	Response No.	Range		Percentile		
		Low	High	10th	50th	90th
Rodents						
Mice-individual	168	0.002	0.500	0.016	0.039	0.090
Mice-group	57	0.008	6.000	0.021	0.120	0.445
Rats-individual	184	0.007	0.850	0.040	0.084	0.170
Rats-group	44	0.020	2.100	0.036	0.125	0.545
Hamsters-individual	146	0.014	0.850	0.041	0.080	0.188
Hamsters-group	37	0.020	2.100	0.041	0.150	0.450
Guinea pigs-individual	140	0.017	0.500	0.100	0.190	0.330
Guinea pigs-group	24	0.090	2.100	0.100	0.247	0.949
Other rodents-individual	68	0.020	1.750	0.025	0.080	0.398
Other rodents-group	10	0.040	3.000	0.044	0.275	2.742
Rabbits-individual	194	0.030	3.150	0.200	0.400	0.673
Rabbits-group	13	0.120	3.600	0.128	0.350	3.390
Carnivores[b]						
Dogs (rs)-individual	164	0.270	4.000	0.654	1.485	2.500
Dogs (rs)-group	13	0.750	3.500	0.775	1.810	3.491
Dogs (br)-individual	84	0.116	3.930	0.560	1.500	2.545
Cats (rs)-individual	156	0.239	6.990	0.410	0.850	1.600
Cats (rs)-group	10	0.450	2.200	0.455	0.905	2.145
Cats (br)-individual	69	0.270	2.889	0.402	0.860	1.440
Other carnivores-individual	13	0.080	1.600	0.096	0.400	1.580
Birds-individual	104	0.023	0.866	0.060	0.220	0.468
Birds-group	16	0.030	7.000	0.030	0.400	6.463
Ungulates						
Swine-individual	103	0.100	3.930	0.751	1.690	3.000
Sheep-individual	105	0.080	4.560	0.555	1.580	2.999
Sheep-group	13	0.600	77.540	0.619	1.750	70.136
Goats-individual	102	0.230	4.560	0.602	1.500	2.999
Goats-group	11	0.600	77.540	0.614	1.190	70.136
Cattle-individual	44	0.400	8.117	1.156	2.120	4.736
Horses-individual	27	0.450	7.500	0.620	2.250	4.644
Nonhuman primates						
Rhesus-individual	111	0.250	3.050	0.800	1.380	2.009
Cynomolgus-individual	79	0.280	3.000	0.650	1.260	2.000
Stumptails-individual	58	0.400	2.450	0.805	1.426	2.195
Other macaques-individual	48	0.400	3.320	0.800	1.470	2.436
Baboons-individual	56	0.500	5.000	1.000	1.715	2.747
African green monkeys-indiv.	26	0.500	2.200	0.620	1.326	2.195
Chimpanzees-individual	16	1.000	5.020	1.000	2.975	5.018
Gibbons-individual	10	1.000	3.770	1.000	1.225	3.593
Other Old World species-indiv.	25	0.133	2.150	0.375	1.250	2.000
Squirrel monkeys-individual	59	0.180	2.450	0.500	1.000	1.750
Tamarins-individual	18	0.366	2.150	0.369	1.000	2.110
Marmosets-individual	21	0.366	2.150	0.410	1.000	1.975
Owl monkeys-individual	30	0.366	2.500	0.500	1.050	1.975
Other New World species-indiv.	32	0.366	2.150	0.464	1.000	1.741

[a] Includes only those species for which at least 10 responses were received.

[b] rs = random source.
br = bred for research.

TABLE 28. Per Diem Rates (Dollars) Charged for Selected Species by Nonprofit Biomedical Research Organizations According to Percentage of Budget That Was Self-Sustaining

Species	Percentage of Self-Sustaining Budget			
	0 to 25	26 to 50	51 to 75	76 to 100
Mice	0.030 (16)[a]	0.031 (30)	0.046 (28)	0.040 (35)
Rats	0.068 (18)	0.064 (30)	0.090 (30)	0.103 (38)
Hamsters	0.050 (14)	0.066 (28)	0.093 (27)	0.088 (35)
Guinea pigs	0.120 (15)	0.163 (28)	0.215 (26)	0.215 (25)
Rabbits	0.330 (19)	0.306 (33)	0.425 (32)	0.435 (39)
Cats	0.540 (10)	0.691 (31)	0.844 (33)	0.940 (38)
Dogs	1.000 (12)	1.099 (30)	1.680 (33)	1.560 (36)

[a]Median percentile rate (number of respondents).

(table 29), only 54 percent have centralized space. An attempt was made, using per diem charges for selected species of laboratory animals, to assess the relative cost efficiency in dispersed facilities and in single-location facilities (table 30). This effort was limited by the small numbers of respondents that had accurate and uniform cost-accounting methods and by the potential for bias in interpreting results.

COMMENTS AND PROJECTIONS

There has been an overall increase in biomedical research funding, but the amount available for projects involving the use of some laboratory animals has remained relatively stable. It could not be determined whether this represents a stable level of funding for basic research (with the bulk of the increase being used for clinical research) or some other factor. It is apparent that there has been some substantial redistribution in the recipients of such funds.

In spite of this increase in biomedical research funds, recovery of animal care costs has not kept pace with actual costs. User fees, including per diem costs, vary widely and do not appear to have achieved the level of cost-accounting that is necessary to ensure an equitable distribution of costs on a direct-charge basis. Perhaps this is why animal care costs have been the most vulnerable in attempts to meet the problems of inflation with a nearly constant research budget and have occasionally been arbitrarily reduced.

It is recognized that the user fee, including the per diem charge, is only one of many possible mechanisms of apportioning direct costs to research projects. However, if properly determined, it can be the most accurate basis for assessing equitable costs. The fact that approximately half the biomedical

TABLE 29. Percentages of Various Nonprofit Biomedical Research Organizations Reporting Centralization of Animal Facility, Service Area, and/or Management in FY 1968 and FY 1978

Type of Organization	Centralized Location		Centralized Service Area	Centralized Management
	FY 1968, %	FY 1978, %	FY 1978, %	FY 1978, %
Schools				
Medical	32	36	37	84
Veterinary	0	9	0	30
Universities and colleges	37	44	19	35
Other health professional	88	69	46	89
Universities with affiliated professional	16	9	20	53
Hospitals	78	73	47	78
Research institutes and laboratories	69	63	51	75
Total	47	54	32	61

TABLE 30. Comparison of Per Diem Rates (Dollars) of Selected Species of Laboratory Animals in Centralized Versus Decentralized Locations in Nonprofit Biomedical Research Organizations (FY 1978)

Species	Animal Facility Location		Net Change, %
	Single	Dispersed	
Mice	0.030[a]	0.046	+53
Rats	0.080	0.090	+13
Hamsters	0.080	0.093	+16
Guinea pigs	0.189	0.215	+14
Rabbits	0.400	0.425	+ 6
Dogs	1.500	1.680	+12

[a]Median per diem rate for individual animal; 51-75 percent self-sustaining budget.

research organizations can prorate only half their animal care costs suggests that cost-accounting should be given greater emphasis.[a]

The data suggest that animal care programs in centralized facilities are more efficient than those in dispersed facilities. Accordingly, it stands to reason that the greater the dispersion, the greater the increase in labor cost to maintain a facility. However, it is recognized that dispersed animal facilities may be required for some research programs.

Financial accountability of animal care programs, then, can be expected to receive increasing attention in the next decade. Primary factors that can help to achieve efficiency include centralization of animal care programs within the research organization and the use of cost-accounting as a more effective management tool.

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[a] Cost Analysis and Rate Setting Manual for Animal Resource Facilities. Rev. October 1979. Animal Resource Program, Division of Research Resources, National Institutes of Health, in cooperation with the Association of American Medical Colleges. U.S. Department of Health, Education, and Welfare, NIH Publication No. 80-2006.

O.M.B. Clearance No. 068-S78017
Expiration Date: June 1979

APPENDIX

SURVEY OF LABORATORY ANIMAL FACILITIES AND RESOURCES

conducted by
the
Institute of Laboratory Animal Resources
National Academy of Sciences—National Research Council
under the Sponsorship of
Animal Resources Program Branch, Division of Research Resources
National Institutes of Health

Please type or print:

Name of Laboratory Animal Facility

_____

Name of Organization

_____

Name of Parent Institution (if different from Organization)

_____

Mailing Address of Laboratory Animal Facility

_____
(Street Address or P.O. Box No.)

_____ _____ _____
(City) *(State)* *(Zip Code)*

Questionnaire Prepared by:

_____
(Name)

_____
(Title)

_____
(Telephone Number, including Area Code)

_____
(Date)

[ ]

_____

Please Return Completed Questionnaire To:

Institute of Laboratory Animal Resources (JH 226)
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418
[Phone: (202) 389-6340 for direct contact]

PURPOSE AND SCOPE

The purpose of this survey is to assemble current information, not otherwise available, that the National Institutes of Health and other federal agencies can use in planning future programs of assistance for laboratory animal activities in biomedical research. All known users of laboratory animals are being surveyed. More comprehensive information is requested from the types of institutions engaged in biomedical research to which NIH provides the bulk of its program support, i.e., medical schools, veterinary schools, dental schools, pharmacy schools, research institutes, hospitals, colleges, and universities. Information requested from other animal users focuses on requirements that NIH-sponsored programs indirectly affect, namely, animal sources and usage, and personnel and training requirements.

Data gathered during an earlier survey of this kind (1968) was extremely useful to the National Institutes of Health in planning and instituting programs for improving the quality and availability of laboratory animals used in biomedical research; promoting better institutional care and humane treatment of laboratory animals; providing better animal facilities; and establishing programs for training people in laboratory animal medicine. The data were also used by research institutions in planning their programs to provide the animals and animal care essential to good quality research.

During the current period of growing costs and budgetary limitations, it is of great importance that a comprehensive study be made to determine the areas of greatest need and utilization for laboratory animal resources. The data collectad in the 1968 survey are now completely out of date. Biomedical research is evolving rapidly, and significant changes are occurring in the requisite resources.

The present survey is designed to determine the current status, unfilled needs, and future requirements for research animals, animal resource personnel, facilities, and programs. The information will be essential to a wise allocation of federal and local resources to assist in providing the necessary animal resources for biomedical activities. The data will also provide a useful norm by which individual research institutions may evaluate their resources and plan for expansion and improvement. By comparing data obtained from the current survey with that derived from the 1968 effort, it is hoped that useful insights into trends will be developed.

Please be assured that reports prepared from the survey will not reveal the specific data of any single facility or organization; instead, results, analyses, and conclusions will deal only with aggregate data. A copy of the final report will be mailed to each organization responding.

DEFINITIONS

The term *Organization* as used in this survey is defined as a major operating unit such as a professional school, hospital, research institute, or college. It may be part of a larger parent institution, e.g., university, corporation—or it may be independent; it may have subsidiary elements, e.g., departments—or it may not.

A *Laboratory Animal Facility* means the physical plant, equipment, personnel, and animals associated with *all* laboratory animal care or usage *within* the organization, whether physically dispersed or in one location.

A *Laboratory Animal* means any living warm-blooded vertebrate animal used, or intended for use, in connection with biomedical activities.

GENERAL INSTRUCTIONS

If your organization *is* eligible for federal grants, please complete all sections of Parts A and B of the Questionnaire.

If your organization *is not* eligible for federal grants, complete only the following:

Part A—Sections I and II
Part B—Sections I, II, III, IV, and VII

To ensure that all animal facilities are included in the survey, but to avoid duplicate reporting, the following principle should be used as a guideline: *complete Part B of the questionnaire on the basis of all animal activities for which the organization has scientific supervision and operating budget control.*

Illustrative examples are:

1. All the satellite laboratory animal care operations of a medical school (or other organization as defined above) that are managed by the school represent a single facility for the purpose of this survey, regardless of where it is located, as for exam-

ple, in an affiliated independent hospital. The hospital in this instance should complete Part B of the questionnaire only for the animal facility activities which it has under its own scientific supervision and operating budget control.

2. Organizations, as defined above, that use centralized services (e.g., animal receipt, storage) under the administrative control of another organization (e.g., dental or pharmacy schools that use centralized services of a medical school), should respond only to those items in Part B of the questionnaire that are applicable to those parts of the animal facility that they directly control.
3. Where there is shared use of any kind between organizations, the organizations are urged to coordinate their responses to their questionnaire in order to ensure (a) coverage of all laboratory animal activities, and (b) elimination of duplicate reporting.

SPECIFIC INSTRUCTIONS

All animals and animal care operations associated with biomedical activities under the scientific supervision and operating budget control of the organization must be included in this questionnaire. Do *not* include farm animals used in agriculture research of a non-biomedical nature, i.e., animals used for draft or farm production.

Most items in the questionnaire require only a check mark or "X" in the box next to the answer alternative that best fits your facility. Lines are provided for writing in numbers, or brief word fill-in-responses, for those items that require more than a check mark. For the reporting period, use your own most recently completed fiscal year, and identify the inclusive dates.

For questions that require numerical answers, please enter the numerals in the squares provided. Always position the total number so that the last digit of your answer is in the last square to the right, with attention to decimals and comma punctuation.

Examples:

1. Percentage Answer Required:

   Enter 9% as [ ][ ][9] %

2. Number Answer Required:

   Enter 123 as [ ][ ],[1][2][3] Acres

3. Dollar Answer Required:

   $ [ ][ ],[1][1][5][5][0]

The information requested in this questionnaire is very important. If records are not available to allow complete accuracy in responding to those items that request values, percentages, and measurements, carefully considered approximations should be substituted.

If any answer does not fit in space allowed, ignore space limitation in making your entry. Please check here if you have this experience. ☐

[ ] 1-6

PART A—ORGANIZATION

I. ADMINISTRATION

CARD 01

For ILAR Use Only
[ ][ ][ ][ ][ ]
09-13

REPORTING PERIOD FOR THIS SURVEY: Indicate beginning and ending dates (month, day, year) of your own most recently completed fiscal year. _____

1. Check the type of *organization* for which your answers to this questionnaire are being made. *(Check one or more.)*

A. Academic Institution

(1) Professional School

Medical	☐ 14-1	Nursing	☐ 18-5
Dental	☐ 15-2	Veterinary	☐ 19-6
Osteopathic	☐ 16-3	Public Health	☐ 20-7
Pharmacy	☐ 17-4	Life Sciences	☐ 21-8

(2) Other University School or College

Agriculture	☐ 22-1
Engineering	☐ 23-2
Arts and Sciences	☐ 24-3

(3) University or College Institution as a Whole (Exclusive, if applicable, of any of above schools or colleges completing a separate questionnaire) ☐ 25-4

(4) Other ☐ 26-5 Specify_____

B. Independent Hospital

(1) University Affiliated ☐ 27-1

(2) Non-University Affiliated ☐ 28-2

C. State or Local Government

(1) Hospital ☐ 29-3

(2) Research Institute or Laboratory ☐ 30-4

D. Private Research Institute or Laboratory

(1) Eligible for Federal Grants:

University Affiliated ☐ 31-5

Non-University Affiliated ☐ 32-6

(2) Not Eligible for Federal Grants ☐ 33-7

E. Other:

Please specify ☐ 34-8

_____

2. Are your laboratory animal facilities in compliance with the *Guide for the Care and Use of Laboratory Animals* [DHEW Publication No. (NIH) 74-23, Revised 1972]?

NO ☐ 35-1
(If NO, go to Item 3.)

YES ☐ 35-2
(If YES, check the basis for this determination.)

(1) By accreditation ☐ 36-1

(2) By institutional animal care committee ☐ 36-2

(3) By both (1) and (2) ☐ 36-3

(4) Other *(specify)* ☐ 36-4

_____

3. Does your *organization* have one person designated as director for laboratory animal care?

NO ☐ 37-1
(If NO, go to Item 6.)

YES ☐ 37-2

4. What percentage of animal facility space and care is under his direct supervision?

☐☐☐ % 38-40

5. Check academic degree(s) of director

a. Level I *(More than one box may be checked for this level.)*

DVM ☐ 41-1 PhD ☐ 42-2 MD ☐ 43-3 Other Doctorates ☐ 44-4

b. Level II
Master's Degree ☐ 45-5

c. Level III
Bachelor's Degree ☐ 46-6

d. Other ☐ 47-7

II. BIOMEDICAL RESEARCH PROGRAM

6. Did your *organization* conduct biomedical research during your most recently completed fiscal year?

NO ☐ 48-1
(If NO, go to PART B.)

YES ☐ 48-2

7. What was your *organization's* total (direct plus indirect) biomedical research budget, excluding construction, during the reporting period?

$ ☐☐,☐☐☐,☐☐☐ 49-56

8. Approximately what amount of the total reported in Item 7 was for research projects involving use of some laboratory animals?

$ ☐,☐☐☐,☐☐☐ 57-63

9. How much of the amount in Item 8 was provided by NIH grants and/or contracts?

$ ☐,☐☐☐,☐☐☐ 64-70

10. Are you now using hazardous or potentially hazardous agents in animal experiments?

NO ☐ 71-1
(If NO, go to Item 11.)

YES ☐ 71-2
(If YES, check the types.)

(1) Microbiologic agent ☐ 72-1
(2) Chemical/toxic agent ☐ 73-2
(3) Radioactive agent ☐ 74-3

11. Do you expect to use hazardous or potentially hazardous agents in the future?

NO ☐ 75-1
(If NO, go to PART B.)

YES ☐ 75-2
(If YES, check the types.)

(1) Microbiologic agent ☐ 76-1
(2) Chemical/toxic agent ☐ 77-2
(3) Radioactive agent ☐ 78-3

PART B—ANIMAL FACILITY

I. ANIMAL SOURCES AND USAGE

CARD 02

1. Specify the approximate use of your facility for each of the purposes listed below. ***(Total of entries in both columns should each equal 100%.)***

	% of Net Sq. Ft. of Space Used	% of Total No. of Animals Used
Teaching	☐☐☐ % 09-11	☐☐☐ % 12-14
Diagnosis and testing	☐☐☐ % 15-17	☐☐☐ % 18-20
Biomedical research	☐☐☐ % 21-23	☐☐☐ % 24-26
Biologic products		
Production	☐☐☐ % 27-29	☐☐☐ % 30-32
Quality control and safety testing	☐☐☐ % 33-35	☐☐☐ % 36-38
Breeding		
Production	☐☐☐ % 39-41	☐☐☐ % 42-44
Research	☐☐☐ % 45-47	☐☐☐ % 48-50
Other *(Specify use)* _____	☐☐☐ % 51-53	☐☐☐ % 54-56
	TOTAL 100%	TOTAL 100%

2. Is research related to laboratory animal medicine being conducted at your facility?

NO ☐ 57-1 YES ☐ 57-2

(If NO, go to Item 4.)

3. What types of problems are being investigated, who conducts the investigations, and how are they supported? ***(Check appropriate places in table.)***

Character and Support of Research in Laboratory Animal Medicine

Types of Research *(check one or more)*	Research Conducted by Members of Animal Care Unit *(check)* NO	YES	Type of Support *(check one or more)* NIH	Other Peer-Reviewed Support	Other *(specify)*	
Diseases	☐ 58-1	☐ 58-2	☐ 59-3	☐ 60-4	☐ _____	61-5
Care and Management	☐ 62-1	☐ 62-2	☐ 63-3	☐ 64-4	☐ _____	65-5
Screening*	☐ 66-1	☐ 66-2	☐ 67-3	☐ 68-4	☐ _____	69-5
Genetics	☐ 70-1	☐ 70-2	☐ 71-3	☐ 72-4	☐ _____	73-5
Other *(specify)* _____	☐ 74-1	☐ 74-2	☐ 75-3	☐ 76-4	☐ _____	77-5

*quality control, collection of normal baseline data, clinical testing, etc.

4. In the table below, please indicate for each species maintained in your facility:

A. Number in Average Daily Inventory for reporting period and

B. Number acquired by source during reporting period

SPECIES	Average Daily Inventory	Number Acquired from Own Breeding during Reporting Period						Number Acquired from Commercial Sources during Reporting Period			
		Random-Bred	Inbred	Hybrid	Other *(specify below)*	Genetic Records Available *(check)* NO	Genetic Records Available *(check)* YES	Random-Bred	Inbred	Hybrid	Other *(specify below)*
PRIMATES											
Rhesus (*Macaca mulatta*) CARD 03	09-12	13-15		16-18	19-21	22-1	22-2	23-25		26-28	29-31
Cynomolgus (*Macaca fascicularis*)	32-35	36-38		39-41	42-44	45-1	45-2	46-48		49-51	52-54
Stumptails (*Macaca arctoides*) CARD 04	09-12	13-15		16-18	19-21	22-1	22-2	23-25		26-28	29-31
Other macaque species	32-35	36-38		39-41	42-44	45-1	45-2	46-48		49-51	52-54
Baboons (*Papio & Theropithecus* species) CARD 05	09-12	13-15		16-18	19-21	22-1	22-2	23-25		26-28	29-31
African green monkeys (*Cercopithecus aethiops*)	32-35	36-38		39-41	42-44	45-1	45-2	46-48		49-51	52-54
Chimpanzees (*Pan troglodytes*) CARD 06	09-12	13-15		16-18	19-21	22-1	22-2	23-25		26-28	29-31
Gibbons (*Hylobates* species)	32-35	36-38		39-41	42-44	45-1	45-2	46-48		49-51	52-54
Other Old World species CARD 07	09-12	13-15		16-18	19-21	22-1	22-2	23-25		26-28	29-31
Squirrel monkeys (*Saimiri sciureus*)	32-35	36-38		39-41	42-44	45-1	45-2	46-48		49-51	52-54
Tamarins (*Saguinus* species) CARD 08	09-12	13-15		16-18	19-21	22-1	22-2	23-25		26-28	29-31
Common marmoset (*Callithrix jacchus*)	32-35	36-38		39-41	42-44	45-1	45-2	46-48		49-51	52-54
Owl monkeys (*Aotus trivirgatus*) CARD 09	09-12	13-15		16-18	19-21	22-1	22-2	23-25		26-28	29-31
Other New World species	32-35	36-38		39-41	42-44	45-1	45-2	46-48		49-51	52-54
TOTAL PRIMATES CARD 10	09-13	14-17		18-21	22-25			26-29		30-33	34-37

SPECIES		Average Daily Inventory	Number Acquired from Own Breeding during Reporting Period: Random-Bred	Inbred	Hybrid
RODENTS AND RABBITS					
Mice	CARD 11	09-14	15-19	20-24	25-29
Rats	CARD 12	09-14	15-19	20-24	25-29
Hamsters	CARD 13	09-14	15-19	20-24	25-29
Guinea Pigs	CARD 14	09-14	15-19	20-24	25-29
Rabbits	CARD 15	09-14	15-19	20-24	25-29
Other rodents	CARD 16	09-14	15-19	20-24	25-29
TOTAL RODENTS AND RABBITS	CARD 17	09-15	16-21	22-27	28-33
BIRDS	CARD 18	09-14	15-19	20-24	25-29
CARNIVORES					
Dogs (Random source)	CARD 19	09-14	15-19	20-24	25-29
Dogs (Bred for research)	CARD 20	09-14	15-19	20-24	25-29
Cats (Random source)	CARD 21	09-14	15-19	20-24	25-29
Cats (Bred for research)	CARD 22	09-14	15-19	20-24	25-29
Other carnivores	CARD 23	09-14	15-19	20-24	25-29
TOTAL CARNIVORES	CARD 24	09-15	16-21	22-27	28-33
UNGULATES					
Swine	CARD 25	09-14	15-19	20-24	25-29
Sheep	CARD 26	09-14	15-19	20-24	25-29
Goats	CARD 27	09-14	15-19	20-24	25-29
Cattle	CARD 28	09-14	15-19	20-24	25-29
Horses	CARD 29	09-14	15-19	20-24	25-29
Other ungulates	CARD 30	09-14	15-19	20-24	25-29
TOTAL UNGULATES	CARD 31	09-15	16-21	22-27	28-33
OTHER (*specify*)	CARD 32	09-14	15-19	20-24	25-29

Other *(specify below)*	Genetic Records Available *(check)*		Number Acquired from Commercial Sources during Reporting Period			
			Random-Bred	Inbred	Hybrid	Other *(specify below)*
	NO	YES				
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
34-39			40-46	47-53	54-60	61-67
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
34-39			40-46	47-53	54-60	61-67
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
30-34	35-1	35-2	36-41	42-47	48-53	54-59
34-39			40-46	47-53	54-60	61-67
30-34	35-1	35-2	36-41	42-47	48-53	54-59

5. Primary source of information in above table: *(Check only one alternative.)*

CARD 33

Organizational records ☐ 09-1 Approximation ☐ 09-2

6. Did you acquire animals from outside the continental United States during the reporting period?

NO ☐ 10-1
(If NO, go to Item 7.)

YES ☐ 10-2
(If YES, give species, country of origin, and number acquired during reporting period. Exclude nonhuman primates acquired from commercial sources.)

7. Do you maintain or hold animals for research on aging. *(Use your own definition of aged and give age range.)*

NO ☐ 11-1
(If NO, go to Item 8.)

YES ☐ 11-2
(If YES, fill out table below.)

Species	Strain	Number of Animals	Age Range	Type of Housing		
				Conventional	Barrier	Germfree

II. FACILITY ADMINISTRATION

8. Are you concerned about your future ability to conform with the provisions of the *Guide for the Care and Use of Laboratory Animals* (National Research Council)?

NO . ☐ 12-1
(If NO, go to Item 9.)

YES ☐ 12-2
(If YES, check below the areas of potential problems.)

(1) Laboratory Animal Management
- Lack of space ☐ 13-1
- Lack of equipment ☐ 14-2

(2) Laboratory Animal Quality and Health
- Adequate veterinary care ☐ 15-3
- Environmental control ☐ 16-4

(3) Personnel
- Occupational health program ☐ 17-5
- Professional personnel ☐ 18-6
- Animal technicians (caretakers) ☐ 19-7
- Specialized supporting personnel ☐ 20-8

(4) Need for alteration and renovation of physical plant ☐ 21-9

III. PERSONNEL

9. In the table below, specify for each category of personnel

A. The number of fulltime and fulltime equivalents (FTE) personnel who are employed by your *organization* in *laboratory animal care* at your facility (exclusive of research personnel).

B. Present unfilled personnel needs expressed in fulltime equivalents (FTE).

C. Estimated additional personnel needs in 1983 expressed in fulltime equivalents (FTE).

D. Administrative personnel.

(Please use the definitions of categories of personnel found on the bottom of the page for completing the table.)

CATEGORY	Currently Employed		Present Unfilled Needs		Estimated Additional Needs in 1983 (FTE)*
	Number	FTE*	Positions Funded (FTE)*	Positions not Funded (FTE)*	
DVM–Laboratory Animal Medicine	22-24	25-27	28-30	31-33	34-36
DVM–Pathology	37-39	40-42	43-45	46-48	49-51
Other Doctorates**	52-54	55-57	58-60	61-63	64-66
Specialized Supporting Personnel*** CARD 34	09-11	12-14	15-17	18-20	21-23
Animal Technicians (Caretakers)	24-26	27-29	30-32	33-35	36-38
Administrative Personnel****	39-41	42-44	45-47	48-50	51-53
TOTALS	54-57	58-61	62-65	66-69	70-73

**Full Time Equivalent*—This is a means of converting parttime work to a fulltime equivalent (e.g., If four employees work fulltime and two work halftime, this would be a fulltime equivalent of five.). Round to nearest tenth.

***Includes MD, DDS, PhD, and DVM with specialty training other than laboratory animal medicine or pathology.

****Includes X-ray technicians, medical technicians, operating room personnel.

*****Includes facility director (if not already included in another category), business manager, accountant, secreteries, etc.

IV. TRAINING

10. Based on your experience and judgment, without consideration of your own recruitment needs, estimate degree of importance of establishing or strengthening training courses in the principles of laboratory animal care for the personnel categories listed below. *(Check one)*

CATEGORY	Degree of Importance			Local Training Available	
	Very Important	Important	Not Important	NO	YES
Laboratory Animal Care Personnel	CARD 35				
Professional	☐ 09.1	☐ 09.2	☐ 09.3	☐ 10.1	☐ 10.2
Supervisory and administrative	☐ 11.1	☐ 11.2	☐ 11.3	☐ 12.1	☐ 12.2
Specialized supporting	☐ 13.1	☐ 13.2	☐ 13.3	☐ 14.1	☐ 14.2
Animal technicians (caretakers)	☐ 15.1	☐ 15.2	☐ 15.3	☐ 16.1	☐ 16.2
Research Personnel					
Investigators	☐ 17.1	☐ 17.2	☐ 17.3	☐ 18.1	☐ 18.2
Technicians	☐ 19.1	☐ 19.2	☐ 19.3	☐ 20.1	☐ 20.2

V. PLANT AND EQUIPMENT

11. Is your on-campus (on-site) animal facility dispersed in two or more locations, or is it situated or housed in a single physical location?

Single Physical Location ☐ 21.1 Dispersed ☐ 21.2

12. Are your service areas centralized? (Receipt, quarantine, laboratories, waste disposal, x-ray, surgery, offices, cage and equipment cleaning) *(Check only one alternative.)*

All Centralized ☐ 22.1
Partly Centralized ☐ 22.2
Dispersed ☐ 22.3

13. Are your laboratory animal facilities under central management?

NO ☐ 23.1 YES ☐ 23.2 PARTIAL ☐ 23.3

14. In the table below, please indicate the net square feet of your animal facility space (on and off campus or site) in each of the various categories which represent:

1. Space currently *in use* or *under construction.*
2. Space in use but in need of *remodeling.*
3. Space in use but in need of *replacement.*
4. Additional space *now needed* (in addition to current in-use spece).
5. Estimated cost per square foot (round to nearest dollar).
6. Additional space estimated *as needed in 1988* (in addition to current in-use space).

Net Square Feet: Floor space in rooms devoted to programmatic uses. Includes cage washing rooms, laboratories, operating rooms, storage areas, etc., but *not* mechanical room space, corridors, toilets, locker rooms, lobbies or lounges.

Please review the definitions of the categories of space at the bottom of the table before completing this item.

Space Category	Net Sq. Ft. Currently In-Use or Under Construction	Net Sq. Ft. in Use: But Need Remodeling	Net Sq. Ft. in Use: Estimated Cost/Sq. Ft.	Net Sq. Ft. in Use: But Need Replacement	Net Sq. Ft. in Use: Estimated Cost/Sq. Ft.	Additional Space Now Needed (net sq. ft.)	Estimated Cost/Sq. Ft.	Estimated Additional Space Needed in 1988 (net sq. ft.)
ANIMAL SPACE								
Class A* CARD 36	,___ 09-14	,___ 15-19	___ 20-22	,___ 23-27	___ 28-30	,___ 31-35	___ 36-38	,___ 39-43
Class B**	,___ 44-49	,___ 50-54	___ 55-57	,___ 58-62	___ 63-65	,___ 66-70	___ 71-73	,___ 74-78
Class C*** CARD 37	,___ 09-14	,___ 15-19	___ 20-22	,___ 23-27	___ 28-30	,___ 31-35	___ 36-38	,___ 39-43
Class D****								
a.	,___ 44-49	,___ 50-54	___ 55-57	,___ 58-62	___ 63-65	,___ 66-70	___ 71-73	,___ 74-78
b. CARD 38	,___ 09-14	,___ 15-19	___ 20-22	,___ 23-27	___ 28-30	,___ 31-35	___ 36-38	,___ 39-43
c.	,___ 44-49	,___ 50-54	___ 55 57	,___ 58-62	___ 63-65	,___ 66-70	___ 71-73	,___ 74-78
d. CARD 39	,___ 09-14	,___ 15-19	___ 20-22	,___ 23-27	___ 28-30	,___ 31-35	___ 36-38	,___ 39-43
Animal Service Areas*****	,___ 44-49	,___ 50-54	___ 55-57	,___ 58-62	___ 63-65	,___ 66-70	___ 71-73	,___ 74-78
Ancillary Prof. Services****** CARD 40	,___ 09-14	,___ 15-18	___ 19-21	,___ 22-25	___ 26-28	,___ 29-32	___ 33-35	,___ 36-39
TOTALS	,___ 40-46	,___ 47-52		,___ 53-58		,___ 59-64		,___ 65-70

ANIMAL SPACE

Class A* – Completely enclosed animal rooms with environmental controls.

Class B** – Combination indoor-outdoor housing and restricted exercise areas, such as kennels with runs, indoor-outdoor primate facility (includes both indoor and outdoor space).

Class C*** – Shelters with no environmental controls (e.g., barns, open sheds, etc.).

Class D**** – Biohazard containment: a. microbiologic agent; b. redioisotope agent; c. chemical/toxic agent; d. quarantine for newly received animals

ANIMAL SERVICE AREAS*** – Cage washing and sterilization, receipt and processing, storage, office space, incinerator or protected area for refuse.

ANCILLARY PROFESSIONAL SERVICES**** – X-ray facilities, diagnostic laboratory, necropsy, surgery.

15. Primary source of information in preceding table (Item 14): *(Check only one alternative.)*

CARD 41

Organizational records	☐ 09-1
Measurements made for this survey	☐ 09-2
Approximation	☐ 09-3

16. For each equipment category listed below:

a. Check the box in the NOT REQUIRED column if the equipment is unnecessary to the operation of your facility and do not answer any other parts of this question for that category;

b. If the equipment is applicable, and if you currently have such equipment in useable condition, check the box in the AVAILABLE column; and then indicate in the third column the total dollar cost, if any, of needed adjustment (repair, replacement, additional).

c. If you currently do not have the equipment, indicate in the third column the total dollar cost of the equipment which you require.

EQUIPMENT CATEGORIES	NOT REQUIRED	AVAILABLE	TOTAL ESTIMATED COST FOR RENOVATION, REPLACEMENT, AND/OR ADDITIONAL EQUIPMENT CURRENTLY NEEDED
Machine Cage and Rack Washing	☐ 10-1	☐ 10-2	$ ☐☐☐,☐☐☐ 11-16
Surgical Equipment	☐ 17-f	☐ 17-2	$ ☐☐☐,☐☐☐ 18-23
X-ray Equipment	☐ 24-1	☐ 24-2	$ ☐☐☐,☐☐☐ 25-30
Diagnostic Laboratory Equipment	☐ 31-1	☐ 31-2	$ ☐☐☐,☐☐☐ 32-37
Biohazard Control Equipment	☐ 38-1	☐ 38-2	$ ☐☐☐,☐☐☐ 39-44
Cages	☐ 45-1	☐ 45-2	$ ☐☐☐,☐☐☐ 46-51
Emergency Power Equipment	☐ 52-1	☐ 52-2	$ ☐☐☐,☐☐☐ 53-58
Other Animal-related Equipment	☐ 59-1	☐ 59-2	$ ☐☐☐,☐☐☐ 60-65
		TOTAL	$ ☐☐☐,☐☐☐ 66-72

VI. OPERATING COSTS AND BUDGET ACTIVITIES

17. What was the animal care cost within your facility during your most recently completed fiscal year?

CARD 42

Personnel		
Professional	$ ___,___,___	09-14
Specialized Support	$ ___,___,___	15-20
Animal Technicians (Caretakers)	$ ___,___,___	21-26
Administrative	$ ___,___,___	27-32
Subtotal	$ ___,___,___,___	33-39
Consumable Supplies		
Food	$ ___,___,___	40-45
Bedding	$ ___,___,___	46-51
Other Supplies	$ ___,___,___	52-57
Subtotal	$ ___,___,___,___	58-64
Services (e.g., service contracts, travel, equipment rental fees, computer services, cage repairs, etc.)	$ ___,___,___,___	65-71
Animal Purchases	$ ___,___,___,___	72-78
Cages and Equipment Purchases	CARD 43 $ ___,___,___,___	09-15
Institutionally assessed (indirect) costs if charged		
Building and Equipment Depreciation	$ ___,___,___	16-21
Building Maintenance	$ ___,___,___	22-27
Utilities	$ ___,___,___	28-33
General Administrative Expenses	$ ___,___,___	34-39
Subtotal	$ ___,___,___,___	40-46
TOTAL	$ ___,___,___,___	47-53

18. What percentage of your total animal care budget (see Item 17 above) was derived from fees charged to users (i.e., the percentage that is self-sustaining)?

___ % 54-56

19. Primary source of information for Item 17. *(Check only one alternative.)*

Organizational records ☐ 57-1 Approximation ☐ 57-2

20. During your most recently completed fiscal year, did your facility charge users a per diem for animal care?

NO ☐ 58-1 YES ☐ 58-2

(If NO, go to Item 23.)

21. What methods are used to determine your per diem rates? *(Check appropriate boxes.)*

Cost Analysis ☐ 59-1

Survey of Comparisons with Other Institutions ☐ 60-2

Other *(Specify)* _____ ☐ 61-3

_____

22. In the following table, please indicate the average per diem per animal which you charged for animal care (if applicable) in your facility during your most recently completed fiscal year.

Species	Average Per Diem Charges of Your Facility during Reporting Period	
	Individual*	Group**
PRIMATES		
Rhesus (*Macaca mulatta*) CARD 44	$ ___.___ 09-12	$ ___.___ 13-16
Cynomolgus (*Macaca fascicularis*)	___.___ 17-20	___.___ 21-24
Stumptails (*Macaca arctoides*)	___.___ 25-28	___.___ 29-32
Other macaque species	___.___ 33-36	___.___ 37-40
Baboons (*Papio & Theropithecus* species)	___.___ 41-44	___.___ 45-48
African green monkeys (*Cercopithecus aethiops*)	___.___ 49-52	___.___ 53-56
Chimpanzees (*Pan troglodytes*)	___.___ 57-60	___.___ 61-64
Gibbons (*Hylobates* species)	___.___ 65-68	___.___ 69-72
Other Old World species	___.___ 73-76	___.___ 77-80
Squirrel monkeys (*Saimiri sciureus*) CARD 45	___.___ 09-12	___.___ 13-16
Tamarins (*Saguinus* species)	___.___ 17-20	___.___ 21-24
Common marmoset (*Callithrix jacchus*)	___.___ 25-28	___.___ 29-32
Owl monkeys (*Aotus trivirgatus*)	___.___ 33-36	___.___ 37-40
Other New World species	___.___ 41-44	___.___ 45-48
RODENTS AND RABBITS		
Mice	$ ___.___ 49-52	$ ___.___ 53-56
Rats	___.___ 57-60	___.___ 61-64
Hamsters	___.___ 65-68	___.___ 69-72
Guinea Pigs	___.___ 73-76	___.___ 77-80
Rabbits CARD 46	___.___ 09-12	___.___ 13-16
Other rodents	___.___ 17-20	___.___ 21-24

*Individual: refers to daily charge for a single animal.

**Group: refers to daily total charge for entire enclosure independent of how many animals are contained therein.

Species	Average Per Diem Charges of Your Facility during Reporting Period	
	Individual*	Group**
BIRDS	$ ☐.☐☐☐ 25-28	$ ☐.☐☐☐ 29-32
CARNIVORES		
Dogs (Random source)	$ ☐.☐☐☐ 33-36	$ ☐.☐☐☐ 37-40
Dogs (Bred for research)	☐.☐☐☐ 41-44	☐.☐☐☐ 45-48
Cats (Random source)	☐.☐☐☐ 49-52	☐.☐☐☐ 53-56
Cats (Bred for research)	☐.☐☐☐ 57-60	☐.☐☐☐ 61-64
Other carnivores	☐.☐☐☐ 65-68	☐.☐☐☐ 69-72
UNGULATES		
Swine	$ ☐.☐☐☐ 73-76	$ ☐.☐☐☐ 77-80
Sheep CARD 47	☐.☐☐☐ 09-12	☐.☐☐☐ 13-16
Goats	☐.☐☐☐ 17-20	☐.☐☐☐ 21-24
Cattle	☐.☐☐☐ 25-28	☐.☐☐☐ 29-32
Horses	☐.☐☐☐ 33-36	☐.☐☐☐ 37-40
Other ungulates	☐.☐☐☐ 41-44	☐.☐☐☐ 45-48
Other (*specify*)	$ ☐.☐☐☐ 49-52	$ ☐.☐☐☐ 53-56

VII. ADDITIONAL COMMENTS (Optional)

23. Please provide any additional information or comments that you feel would be of value to NIH and other government agencies, or ILAR, in future development of programs of assistance to animal resource activities.

If, in any question, your answer did not fit the space limitation, have you checked the box on instruction page (page 3)?

Please return completed questionnaire promptly, using the enclosed self-addressed, postage-paid envelope:

Institute of Laboratory Animal Resources (JH 226)
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

THANK YOU FOR YOUR COOPERATION