

Recent Trends in the Number of Laboratory Animals Used in Japan

Yukihisa Matsuda

Animal Facilities for Experimental Medicine, Akita University School of Medicine, 1-1-1 Hondo Akita-shi, Akita 010-8543, Japan
E-mail: ymatsuda@med.akita-u.ac.jp

Summary — Surveys on the numbers of laboratory animals used in Japan have been conducted by both the Japanese Association for Laboratory Animal Science (JALAS) and the Japanese Association for Laboratory Animals in National Universities (JALAN). According to the JALAS, in 1998, 5,626,116 animals were used in experiments. Rodents, such as mice and rats, made up 87% of that total, while the total number of dogs, cats and monkeys used was less than 1%. The JALAS reported that the total number of animals used in experiments in 1990 was 8,737,770, a peak of 10,013,584 was reached in 1995, and thereafter the number gradually decreased to 5,626,116 in 1998. During this period, the number of all the species used, except non-human primates and farm animals, decreased. The number of dogs and cats used decreased by over 65%. This decrease was attributed to the activities of animal welfare groups. On the other hand, the JALAN reported that the total number of animals used in experiments doubled from 1991 to 1999. The increase could be attributed to use of genetically modified mice, such as transgenic and knockout mice. Noting problems with the methods used, we concluded that the number of the laboratory animals used in Japan, other than rodents, has been gradually decreasing since 1991.

Key words: JALAN, JALAS, Japan, statistics.

Introduction

Animal experiments in the biomedical and life sciences in our country, as well as in other countries, have raised controversy (1). In Japan, animals used in research, education and product testing are regulated by a national standard, "Standards relating to the care and management, etc. of animals" (2), that was established in 1980 under a national law "Law concerning the protection and control of animals" (3). However, our law, unlike those of the USA and European countries, does not oblige us to report the number of animals used in experiments.

The number of animals used for education, research and testing in Japan has been surveyed by the Japanese Association for Laboratory Animal Science (JALAS) approximately every three years since 1956. The Japanese Association for Laboratory Animals in National Universities (JALAN) has also surveyed the number of animals used in medical education and research institutes every year, established by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The numbers of animals shown in this paper are based on the data from the JALAS and the JALAN.

From the JALAS Data

The data of the JALAS were collected from more than 500 universities, institutes, and laboratory

testing companies (4, 5). Table 1 shows the numbers of animals used by those institutions from 1990 to 1998.

In 1998, 3,153,272 mice, 1,529,676 rats, 21,571 dogs, 4847 cats and 9037 non-human primates were reported to have been used. A total of 5,626,116 animals were used in 1998. About 87% of those animals were rodents, while the sum total of dogs, cats and monkeys made up less than 1% of the total.

The total number of animals used was 8,737,770 in 1990, reaching a peak of 10,013,584 in 1995. Thereafter, the number gradually decreased to 5,626,116 in 1998. The variation in the total number of animals used each year was mainly found in the number of rodents, such as mice and rats. About 7.7 to 9.0 million rodents were used in both 1990 and 1995, but this number decreased to about 4.9 million in 1998. It appears that this reduction is due mainly to changes at certain institutes and companies that use the animals to produce vaccines for infectious diseases, including Japanese encephalitis. Those institutes and companies made no response to the survey in 1998. They may have been concerned that it would compromise their trade secrets or obstruct their business to disclose the number of animals used in their experiments.

From 1990 to 1998, the numbers of all species used decreased, except for non-human primates and farm animals. The numbers of dogs and cats used drastically decreased by more than two-thirds from

Table 1: Numbers of animals used in experiments, from the JALAS data

Animals	1998	% of 1998	1995	1990
Total	5,626,116	100	10,013,584	8,737,770
Mice	3,153,272	55.7	6,682,454	5,192,126
Rats	1,529,676	27.2	2,091,678	2,176,356
Other rodents	206,076	3.7	330,939	312,224
Rabbits	118,307	2.1	100,228	132,333
Dogs	21,571	0.4	37,895	73,142
Cats	4847	0.1	5778	13,436
Non-human primates	9037	0.2	5922	6849
Farm animals	12,787	0.2	9565	8907
Other mammals	5531	0.1	5633	9972
Birds	65,578	1.2	144,335	171,291
Fish/Reptiles/Amphibians	499,434	8.9	599,157	641,134

Source: Results of surveys for 1990, 1995 and 1998 (JALAS).

1990 to 1998. The cause of this reduction is attributed to the Tokyo Government's decision to prohibit the release of pound animals to research institutes. The neighbouring prefectures followed Tokyo's decision within a couple of years. As of 2001, more than 20 prefectures have prohibited the release of such animals for research.

It was difficult to accurately assess the trends of laboratory animals used in our country from the JALAS data, because some agencies made no response to the survey, as described above. Therefore, the JALAN data were used for assessments.

From the JALAN Data

The JALAN consists of 43 national universities that carry out animal experiments in medical education and research. Table 2 shows the numbers of animals used, based on the JALAN data. The total number of animals used was 794,063, 771,423 and 1,281,596 in 1991, 1995 and 1999, respectively. The total number used in 1991 is similar to the number used in 1995, but in 1999, the number increased remarkably. The change in the total number mainly reflects the number of mice. In the JALAN data, the

Table 2: Numbers of animals used in experiments, from the JALAN data

Animals	1999	% of 1999	1995	1991
Total	1,281,596	100	771,423	794,063
Mice	850,205	66.3	430,187	412,237
Rats	365,381	28.5	259,846	280,318
Other rodents	27,599	2.2	34,110	37,736
Rabbits	14,464	1.1	20,062	21,663
Dogs	5656	0.4	12,570	24,359
Cats	1065	0.1	2755	5137
Non-human primates	530	0.0	732	793
Farm animals	1090	0.1	1806	1348
Other mammals	45	0.0	2236	887
Birds	2392	0.2	4505	2848
Fish/Reptiles/Amphibians	13,169	1.0	2614	6828

Source: Results of surveys for 1991, 1995 and 1999 (JALAN).

number of mice doubled from 1995 to 1998. This increase could be attributed to the use of genetically modified mice, such as transgenic and knockout mice. Recently, there has been an explosive increase in the use of such mice. This reflects the development of the Mouse and Human Genome Projects.

The use of dogs and cats was dramatically reduced from 1991 to 1999. The cause of this reduction is attributable to the Tokyo Government's decision to prohibit the release of pound animals to research institutes, as described above. The numbers of dogs used in experiments decreased by a quarter from 1991 to 1999. Though we did not show the data in the table, the fewer pound dogs that are used, the more breeding dogs are used. In 1991, 683 breeding dogs were used, and their use increased to 2192 in 1999. Henceforward, more breeding dogs will be used in medical research. There was a similar reduction in cats, but there are few breeding cats. Therefore, it is now very difficult for researchers to use cats in experiments.

A total of 530 monkeys, including the rhesus monkey, crab-eating monkey and Japanese monkey, were used in 1999. Though we did not show the data in the table, Japanese monkeys accounted for 65% of the total number of monkeys used. The Japanese monkeys are protected as endangered species, but several local governments catch them, because they cause extensive damage to agricultural products. Some of the captured monkeys are used in medical research, a practice that is opposed by animal welfare groups. Researchers cannot use these animals without certain certificates issued by local governments. For this reason, fewer monkeys were used in 1999 than in 1991 or 1995. It has become increasingly difficult to use them. Some universities are preparing to establish breeding facilities for Japanese monkeys. In contrast with the reduction of dogs, cats and monkeys, the number of rats used slightly increased.

Conclusions

In universities, all animal experiments are peer-reviewed under university guidelines for Animal Care Committees, established by order of MEXT in 1998. Most institutes and companies that carry out animal experiments have independently established Animal Care Committees and formed their own guidelines. Experiments that do not comply with the guidelines cannot be carried out in Japan. However, these guidelines are not law.

In 1999, our Animal Welfare law was revised. The object of the revision was mainly to require adequate care for companion animals, such as dogs and cats. The legal provisions on laboratory animals were not revised. Researchers were required only to comply with existing standards.

In 2000, the *Freedom of Information Act* (FOIA; 9) was enacted. Animal welfare groups have demanded access to animal research protocols under this FOIA. Many researchers disagree with such disclosure, claiming that it violates their privacy. It appears that many countries do not disclose protocols. It seems that the public is assured that animal welfare concerns are considered in animal research through incorporating the Council for International Organisations of Medical Sciences (CIOMS) guidelines into their regulations.

In order to protect the privacy of researchers and to promote the welfare of laboratory animals, our standards should be revised. It is important to adopt CIOMS guidelines in any new standard in order to achieve international harmonisation. New standards should be required to ensure that each institute establishes an animal care committee that will be responsible for evaluating the total animal care programme, as well as for examining all proposed animal experiments. It may also be necessary to add the registration and the inspection of animal facilities by authorities, through which the Three Rs will be further promoted in Japan.

References

1. Rowan, A.N. (1997). The benefits and ethics of animal research. *Scientific American*, February 1997, 63–77.
2. Ministry of the Environment (1980). *Standards Relating to the Care and Management, etc of Experimental Animals*. Tokyo, Japan: Ministry of the Environment. Website <http://hayato.med.osaka-u.ac.jp/index/guide/inform/regulation/standard.html>.
3. Ministry of the Environment (1973). *Law Concerning the Protection and Control of Animals*. Tokyo, Japan: Ministry of the Environment. Website <http://hayato.med.osaka-u.ac.jp/index/guide/inform/regulation/law.html>.
4. JALAS Working Group for Laboratory Animal Data Bank (1998). The number of live animals used in experiments in 1995 — results of a survey. *Experimental Animal News* 47, 55–67.
5. JALAS Working Group for Laboratory Animal Data Bank (2001). The number of live animals used in experiments in 1998 — results of a survey. *Experimental Animal News* 50, 57–63.
6. CIOMS (1985). *International Guiding Principles for Biomedical Research Involving Animals*. Geneva, Switzerland: CIOMS. Website http://www.cioms.ch/frame_1985_texts_of_guidelines.htm.
7. Miller, J. (1998). International harmonization of animal care and use: The proof is in the practice. *Lab Animal* 127, 28–31.
8. Russell, W.M.S. & Burch, R.L. (1959). *The Principles of Humane Experimental Technique*, 238pp. London, UK: Methuen. From ALTWeb: http://altweb.hjssph.edu/publications/humane_exp/het-toc.htm.
9. Ministry of Public Management, Home Affairs, Posts and Telecommunications (2000). *Law Concerning Access to Information held by Administrative Organisations*. Tokyo, Japan: Ministry of Public Management, Home Affairs, Posts and Telecommunications.