Fourth EU Report on the Statistics on the Number of Animals Used for Scientific Purposes in 2002 – Trends, Problems, Conclusions

Ursula G. Sauer[1], *Horst Spielmann*[2] *and Brigitte Rusche*[1]

[1]Akademie für Tierschutz (Animal Welfare Academy), D-Neubiberg

[2]ZEBET (National German Centre for the Documentation and Evaluation of Alternatives to Testing in Animals) at the Federal Institute for Risk Assessment, D-Berlin

Summary

In the beginning of the year 2005, the European Commission published the fourth statistical report on the number of laboratory animals used in the EU Member States in the year 2002. A total of 10,731,020 experimental animals was reported, the majority of which were mice, rats and fish. In comparison to 1999, the year of the previous data collection, this is an increase by over 900,000 animals, which is mainly attributed to an increased use in fish. As in the previous years, France, the United Kingdom and Germany were the Member States that reported the highest numbers of laboratory animals. 4.5 million animals were used for the development, production and quality control of products for human medicine, dentistry and veterinary medicine and 1 million animals in toxicological and safety evaluations. 3.7 million animals were used in fundamental studies, and therefore are not covered by the scope of Council Directive 86/609/EEC on the protection of laboratory animals. This regulatory gap leaving more than a third of the laboratory animals used in the European Union without protection by EU legislation is unacceptable and should be closed during a revision of the Directive. All national authorities submitted some kind of explanatory notes alongside their national tables. In the article, an extensive summary and discussion of the contents of these notes is presented. Germany, Austria, Finland report on providing financial support for the development of alternative methods. The numbers put forward in the fourth EU statistical show that such support is desperately needed.

Zusammenfassung: Vierter EU-Statistikbericht über die Anzahl der im Jahr 2002 für wissenschaftliche Zwecke verwendeten Tiere – Tendenzen, Probleme, Schlussfolgerungen

Zu Beginn des Jahres 2005 veröffentlichte die Europäische Kommission den vierten Statistikbericht über die Anzahl Versuchstiere, die im Jahr 2002 in den EU Mitgliedsstaaten verwendet wurden. Insgesamt wurden 10.731.020 Versuchstiere gemeldet, überwiegend Mäuse, Ratten und Fische. Im Vergleich zu 1999, dem Jahr der letzten EU-Datenerhebung, stellt dies eine Zunahme um über 900.000 Tiere dar, die im Wesentlichen einer verstärkten Verwendung von Fischen zugeordnet wird. Wie in den Vorjahren waren Frankreich, das Vereinigte Königreich und Deutschland die Mitgliedsstaaten, in denen die meisten Versuchstiere erfasst wurden. 4,5 Millionen Versuchstiere wurden für die Entwicklung, Herstellung und Qualitätskontrolle von human-, zahn- oder veterinärmedizinischen Produkten verwendet sowie 1 Million Versuchstiere in toxikologischen und anderen Sicherheitsprüfungen. 3,7 Millionen Versuchstiere wurden in der Grundlagenforschung eingesetzt und werden demzufolge von der EU-Richtlinie 86/609/EEC zum Schutz der Versuchstiere nicht erfasst. Diese Gesetzeslücke, die über ein Drittel der EU-weit verwendeten Versuchstiere ohne EU-rechtlichen Schutz lässt, ist nicht hinnehmbar und sollte im Zuge einer Revision der Richtlinie geschlossen werden. Alle nationalen Behörden kommentierten ihre nationalen Tabellen, wenngleich sich die Art und Ausgestaltung dieser Anmerkungen zum Teil erheblich unterschied. In den diesbezüglichen Ausführungen werden die Inhalte der nationalen Kommentare zusammenfassend vorgestellt und diskutiert. Deutschland, Österreich und Finnland berichteten über staatliche Zuwendungen zur Förderung der Entwicklung tierversuchsfreier Verfahren. Die im vierten EU-Statistikbericht vorgelegten Zahlen belegen, dass derartige Fördermaßnahmen dringend erforderlich sind.

Keywords: Statistics, laboratory animal use, fundamental research, regulatory testing, Council Directive 86/609/EEC

Received 18 November 2004; received in final form and accepted for publication 3 January 2005

1 Contents of the fourth EU report on the statistics on the number of animals used for experimental and other scientific purposes in 2002

In the beginning of the year 2005, the European Commission published for the fourth time a statistical report on the use of laboratory animals in the EU Member States (Commission of the European Communities, 2005a). Contrary to the presentation of the previous reports, the fourth statistical report was published in two documents, with the report itself providing a 13 page overview of the data collected and a 189 page "Commission Staff Working Paper", referred to as the "Annex to the Report" (Commission of the European Communities, 2005b), providing detailed information, including all of the EU and respective national tables as well as the comments of the national authorities to the data submitted.

Data for the first and second report (Commission of the European Communities, 1994; 1999) had been collected according to the statistical tables of the Council of Europe as laid down in Appendix B of the European Convention ETS 123 on the protection of laboratory animals from 1986. For the third report (Commission of the European Communities, 2003), the Member States had decided to collect the data according to the harmonised so called "EU tables" that had been agreed upon between the Commission services and the authorities of the Member States in the end of 1997. However, due to an amendment necessary in the respective federal legislation, Germany was unable to submit its statistical data for 1999 according to these EU tables, so that in the third statistical report merely the overall information of numbers of animals used for experimental and other scientific purposes listed according to animal species could be provided for all 15 Member States, whereas detailed information regarding the purposes these animals were used for could only be specified for the remaining 14 Member States.

In the fourth statistical report, for the first time, all Member States used the new EU tables. The data submitted refer to animals that were used in experimental and other scientific procedures that began in the year 2002, except for France that reported on animals used in 2001 (page 7 of the Commission Staff Working Paper, Commission of the European Communities, 2005b): "The complete data for 2002 include statistics from the year 2001 in France. Therefore the totals used in this report are a mixture of years. Comparisons were nevertheless made on this basis since no other data were available." In spite of this, the European Commission considers the data collected to be of adequate quality to enable a meaningful overview on the use of laboratory animals (page 5-6):

Tab. 1.1: Number of animals used in experiments for selected purposes
Purposes versus species (adapted from Table 2.1. on page 15 of the Commission of the European Communities, 2005b)

Species	Biological studies of a fundamental nature	Research and development of products and devices for human medicine and dentistry and for veterinary medicine (excluding toxicological and other safety evaluations)	Production and quality control of products and devices for human medicine and dentistry
Mice	2,125,001	1,475,748	885,987
Rats	638,337	894,279	286,186
Guinea-Pigs	15,920	47,205	76,979
Hamsters	14,567	22,992	111
Other Rodents	16,653	34,925	0
Rabbits	19,621	28,207	142,912
Cats	1,009	1,378	27
Dogs	1,491	4,801	129
Ferrets	912	559	328
Other Carnivores	2,342	0	0
Horses, donkeys and cross breds	1,292	578	1,685
Pigs	24,440	13,285	353
Goats	1,869	137	197
Sheep	12,421	2,216	5,880
Cattle	16,043	5,597	116
Prosimians	599	14	0
New World Monkeys	544	330	22
Old World Monkeys	595	899	315
Apes	0	0	0
Other Mammals	2,886	58	0
Quail	1,653	170	1,950
Other birds	139,970	63,734	51,782
Reptiles	2,668	15	8
Amphibians	28,891	5,411	0
Fish	658,702	446,918	0
TOTAL	**3,728,426**	**3,049,456**	**1,454,967**

[1] All page numbers refer to Commission of the European Communities (2005b).
[2] It has to be noted that a number of member states regulate more areas of animal use than are required on the EU level. Therefore the national figures presented in the EU report can be lower than in the individual national statistics for the same period, since data which is not regulated by the Directive has been deducted. For instance, since the breeding of established transgenic lines is regulated in the United Kingdom, such animals will appear in the UK domestic statistics. However they are deducted from the UK's data submission to the EU (see page 178).

"Member States have in most cases applied a quality control check... The main difference with the previous reports is that the data now cover the complete range of procedures and their purposes... This allows for a more precise and comprehensive picture to be drawn at the EU level for the first time."

1.1 Numbers of animals used

In the year 2002 (and respectively 2001 for France), a total of 10,731,020 experimental animals was counted in the 15 EU Member States, the majority of which were mice (51%), rats (22%) and fish (15%) (page 6): "This indicates an increase in the number of animals in comparison to 1999, which amounted to 9.8 million (9,814,171), but it is still a decrease in comparison with the data of 1996 of 11.6 million." The EU Commission provides further interpretation of these figures (page 9): "In 2002 the total number of animals used increased by about 917,000 (9.3%) with regard to 1999. The increase was mainly due to the additional use of about 970,000 fish." The use of fish again is commented on page 6: "A significant increase in the use of fish has made the group of cold-blooded animals account for over 15% of all animals used." As in the previous years, France, the United Kingdom and Germany were the Member States that reported the highest numbers of laboratory animals used[2] (Table 1.1: Total number of animals used for experimental purposes in the EU Member States).

All in all, about 10,000 non-human primates (1,095 prosimians, 1,192 new world monkeys and 8,075 old world monkeys) were used in experimental and

Production and quality control of products and devices for veterinary medicine	Toxicological and other safety evaluations (including safety evaluation of products and devices for human medicine and dentistry and for veterinary medicine)	Diagnosis of disease	and training	Other	Total
111,709	358,090	187,231	54,716	261,297	5,459,779
16,318	375,656	8,548	52,062	39,908	2,311,294
11,318	66,226	1,698	1,608	5,385	226,339
7,838	3,151	407	421	2,895	52,382
4	415	826	406	5,598	58,827
7,657	45,067	8,232	2,095	13,884	267,675
490	223	393	105	183	3,808
1,093	12,826	262	243	271	21,116
12	133	53	60	21	2,078
385	6	4	0	373	3,110
388	102	191	353	88	4,677
4,,762	2,271	6,958	4,576	4,519	61,164
2	48	163	133	354	2,903
621	368	3,065	730	5,791	31,092
2,054	438	151	949	1,221	2,656
0	482	0	0	0	1,095
0	248	32	0	16	1,192
0	6,102	2	7	155	8,075
0	0	0	0	0	0
0	0	0	3	671	3,618
0	6,914	0	787	1,510	12,984
80,070	12,061	6,631	4,147	163,588	521,983
0	15	0	460	2	3,168
0	5,535	5	14,057	5,790	59,689
20,143	169,670	2,481	204,049	84,440	1,586,403
264,864	**1,066,047**	**227,333**	**341,967**	**597,960**	**10,731,020**

other scientific procedures in 2002. Of these animals 128 new world monkeys (10.7%) and 6,312 old world monkeys (78.2%) were of non-European origin, and 295 new world monkeys (24.7%) and 957 old world monkeys (11.9%) were re-used in procedures. Of the 21,116 dogs reported in the fourth statistical report, 5,539 animals (26.2%) were of non-European origin and 3,384 animals (16.0%) re-used in further procedures (Table 1.4[3]: Number of animals used in relation to their place of origin). The European Commission comments that while the use of old world monkeys as such has increased since 1999 (page 9), "...a decrease of the proportion of hamsters and old world monkeys from European origin" was observed (page 12).

In 2002, 3,049,456 animals (28.4%) were used in research and development and 1,719,831 animals (16%) for the production and quality control of products for human medicine, dentistry and veterinary medicine, while 3,728,426 animals (35%) were used in biological studies of a fundamental nature, and 1,066,047 animals (10.0%) in toxicological and safety evaluations (page 16 and Table 2.1.: Number of animals used in experiments for selected purposes. Purposes versus species). In 1999, 768,992 (9.5%) of the 8,070,446 animals for which detailed information was available were used in toxicological and safety evaluations.

Of the 1,066,047 animals used in toxicological and safety evaluations in 2002, 540,659 animals (50.7%) were used for the testing of products, substances or devices for human medicine, dentistry and veterinary medicine, while 123,217 (11.6%), 135,884 (12.7%) and 132,326 (12.4%) animals were used either to test products or substances used or intended to be used mainly in agriculture, in industry or to test potential or actual contaminants in the general environment. These proportions have increased in relation to the respective figures for 1999 (page 21). In 2002, 2,691 animals (0.25%) were used to test products and substances used or intended to be used mainly as cosmetics or toiletries (Table 3.1.: Number of animals used in toxicological and other safety evaluation. Products versus species).

6,203,399 of the total number of animals used in experimental and other scientific purposes (58%) were reported to have been used for studies of diseases of both humans and animals (page 24). With 2,597,519 animals (41.9%), a large proportion of these was classified as used to study "other human diseases", while 1,474,535 animals (23.8%) were used to study human nervous and mental disorders and 898,195 animals (14.5%) used in studies specific to animal diseases (Table 4.1.: Number of animals used in experiments for studies on human and animal diseases).

Of the total of 1,719,831 animals reported in Table 5.1. (Number of animals used in the production and quality control of products and devices for human medicine and dentistry and for veterinary medicine. Regulatory requirements versus species), 537,836 animals (31.3%) were used to satisfy EU legislation including European Pharmacopoeia and 741,514 animals (43.1%) were used to satisfy legislation that covered a combination of EC legislation, legislation of member countries of the Council of Europe or other countries, while 352,762 animals (20.5%) were used without compliance to any regulatory requirements (page 31): "Some 21% of the animals were not required for any regulatory purposes. To explain this relatively high proportion Member States reported a range of reasons, such as early stages in developmental processes or pilot studies, or additional tests to confirm earlier ambiguous test results. Member States also considered that some unclear data reporting may have been a reason."

Of the total of 1,066,047 animals listed in Table 6.1. (Number of animals used in toxicological and other safety evaluations. Regulatory requirements versus species), 591,920 animals (55.5%) were used to satisfy legislation that complied with EC, Council of Europe member countries' or other countries' legislation, 206,217 animals (19.3%) were used to satisfy EC legislation, while 114,141 animals (10.7%) were used in tests that met no regulatory requirements and 112,014 animals (10.5%) were used in national legislation specific to a single EC Member State (page 33): "The testing to satisfy national legislation specific to a single Member State related for example to national health and safety requirements at the work place. Testing for such purposes appears to have increased from 6% to 11%, but Member States considered that this effect might partly be due to the complexity of data collected from the reporting institutions."

Table 7.1. (Number of animals used in toxicological and other safety evaluations. Type of tests versus species) and Table 8.1. (Number of animals used in toxicological and other safety evaluations. Type of tests versus products) provide further information on the 1,066,047 animals used in toxicological and safety evaluations (page 35 - 36): "The largest percentage of animals is due to acute and sub-acute toxicity tests, 36.7% in 2002 and 38.3% in 1999. With the addition of sub-chronic and chronic toxicity, the percentage of animals used in short and long term systemic toxicity testing accounts for 46% and 52% respectively in 2002 and 1999... An increase is... observed, from 19.5% to 24.1%, in the percentage of animals used for 'other' toxicity tests than those listed in the statistical table... Member States considered that this may be due to a variety of tests conducted by universities or institutions, which may not follow specific guidelines and were therefore summed up by researchers under 'other'. Member States also indicated that 'other' might include tests linked to haemotoxicology, toxicokinetics, pyrogenicity, biocompatibility, immunotoxicology, enzyme induction and allergic reactions of animals."

1.2 Comments of the national authorities

For the fourth statistical report, all national authorities provided some kind of explanatory notes alongside the national tables they submitted, and as in the previous EU statistics reports, these national comments have been published together with the national data.

[3] All table numbers refer to Commission of the European Communities (2005b)

Belgium comments on trends observed in the statistical data. According to the Belgian authorities (page 42), "the increase between 2001 and 2002 in the overall number of animals used (+ 6%) is due essentially to a rise in the number of fish used in fundamental biology studies".

Denmark describes some trends and gives further explanation for specific numbers (page 51). The 371,072 animals used in 2002 are an increase of 3.6% compared to 2001, which is "probably due to random changes and a general increase in activity. Approximately 5,000 of these were fish". A total of 10,194 transgenic mice and 20 transgenic rats were used in *in vivo* experiments, while 1,780 transgenic mice not included in the statistics were used in *in vitro* experiments. The Danish authorities point to an increase in the use of animals for education and training purposes of over 69%: "This increase must be seen in the context of the Order on qualification requirements for persons who handle experimental animals issued by the Ministry of Justice in December 2001. The increased training requirements in the Order and the courses which have to be followed are therefore reflected in the use of experimental animals."

Germany (pages 60-61) makes reference to national legislation and comments on trends observed. Additionally, the German authorities point to national funding for the development of alternative methods and emphasize the commitment of the German government to the 3R principle, which "is seeking to achieve a further reduction in the number of animal experiments to the absolute minimum required in accordance with the state of the art. A key factor being applied by the scientific community and the authorities in this area is the use of databases. The Government is also actively promoting the development of alternatives to animal experiments." The increase "in the numbers of experimental animals over the last three years is being monitored with concern... experts were therefore asked to analyse the notified annual data on the use of experimental animals with a view to identifying areas in which animal experiments can be reduced, or, for example, replaced by alternative methods. The results are to be used in developing a programme to reduce the number of animals used in experiments".

In its comments (pages 70-72), **Greece** refers to national legislation, gives an overview on numbers and trends and provides some further explanation for specific numbers. The Greek authorities underline that they "sent written explanations relating in particular to how to fill in the tables... and stressed that a licence from the Veterinary Directorate of the Prefecture in which the agency is based was needed in order to carry out any experiments". 97.2% of the animals used were fish. Broken down into the purpose of the procedure, 60.11% of the animals were used in fundamental biological studies and 39.89% for education and training purposes. 2,500 of 8,055 the rodents were transgenic mice that were used in one specific institute. "The above data show that the two main purposes of the experiments carried out in Greece were education and training and biological studies of a fundamental nature. Vertebrate animals are therefore used mainly: to study the fundamental biological characteristics of each species and in particular of fish endemic to the waters of the Mediterranean Sea... to educate students and to draw up postgraduate or other research programmes at tertiary education establishments."

Spain (page 81) presents a brief overview of national legislation for statistics and announces: "Currently we are working on an amendment of the regulation which, among others, will establish a new database of the establishments registered in Spain and the procedures that they carry out."

France (pages 90-92) reports on problems in collecting data: "This survey took longer than was expected on the basis of previous experience. The reason for this is that, since 1999, many laboratories have merged their facilities and pooled their zoological staff, with the paradoxical result that getting the questionnaires to the right people is now more difficult than it used to be." Additionally, the French authorities comment on trends and stress their full support for the justification of animal experimentation as well as their doubts regarding the scientific applicability of alternatives. Concerning the total number of animals used, a downward trend has been observed since 1993, even though the latest decrease was less than that seen in previous surveys: "It is likely that the level attained in 2001 is close to the minimum below which public and private research bodies would be unable to fulfil the goals in respect of progress and safety which society has asked them to meet." The percentage of animals used to obtain tissue for *in vitro* studies has remained constant at 11.5% of the total number over the last years: "This shows that *in vitro* procedures do require the sacrifice of a large number of animals and that these procedures are still complementary to *in vivo* procedures, for which there is no visible trend towards alternatives."

The French authorities comment on difficulties to discern trends: "No one could have predicted the 98% increase in the number of amphibians used between 1999 and 2001, given that the number had been constantly falling since 1990... For other animals, where only small numbers are concerned, changes must be treated even more cautiously. For example, the number of cats and pigs has fallen by 50% since 1990, while the number of non-human primates rose by 23% during the same period. What is the conclusion to be drawn from this? ...As regards the places of origin of the animals, however, the figures are meaningful and do make it possible to identify difficulties concerning animal use. While it is understandable that 90.2% of Old World monkeys come from non-EU countries, it is surprising to note that, even though productive breeding establishments could easily be set up in France, 46.9% of New World monkeys, 46.6% of dogs and 43.6% of cats are obliged to make a long journey by air to reach our laboratories, even if the conditions in which they are transported are totally acceptable." In the conclusion to their comments, France states: "These figures, as a whole, show that researchers are constantly striving to reduce the number of vertebrate animals used for experimental purposes. They also show the clear, well- founded legitimacy of experimentation, but reveal the fundamental difficulty which biologists face when trying to understand how life

works: they have no option other than to use live animals."

Ireland (pages 101-102) comments on the data collected and reports a 29% reduction of total animal numbers compared to 1999, of these 949 animals (2%) were genetically modified animals. 48% were rodents and 21,046 of the total number of 52,203 animals were fish. The Irish authorities state: "No primates were used. This was in accordance with Ireland's policy not to licence for the use of primates."

Italy (page 111) indicates a continuous downward trend of the total number of animals used over the last years and comments on its national legislation: "Article 24 of Directive 86/609/EEC has allowed tighter rules to be introduced into Italian law, particularly regarding the use of non-human primates, cats and dogs, as may be seen from Article 3(2) of Legislative Decree 116/92, which states that with regard to non-human primates, cats and dogs, the authorisation stipulated by Article 8(1)(b) is also required."

Luxembourg (page 120) briefly comments on the 5,320 animals used in their Member State and gives some further explanation on the purpose some animals were used for: "A single experimentation project registered in Luxembourg in 2002... The purpose of the experiments is to carry out an immunological study of the protective efficiency and the antigenicity of antigens to improve vaccination strategies and diagnostic procedures for specific diseases."

Apart from commenting on trends, **The Netherlands** (pages 123-125) provide an extensive summary of the revision and the contents of the Experiments on Animals Act as well as of the legislation on transgenic animals. The Dutch authorities further comment: "In 2002, for the creation of transgenic animals, 28,185 animals... were used... The total number of genetically modified animals that was used (108,075) was substantially higher than the number of genetically animals used in 2001 (70,856)." In accordance with Dutch legislation, researchers have to classify the discomfort that the animals experience during the procedures after their finalization: "Discomfort is defined as a state including impairment of the animal's health, or as appreciable pain, injury or other grave distress caused to the animal. For assessment of the degree of discomfort no objective criteria are available. However, respondents are advised to attend to the effect of interferences on the behaviour and/or on the bodily functioning of the animal. At meetings of animal welfare officers information is exchanged and discussed to promote consensus of opinion." 29.2% of the animals experienced moderate or moderate-severe discomfort; 6.1% animals experienced severe or very severe discomfort.

The **Austrian** comments (pages 134-140) include an extensive summary of the National legal situation and emphasize Austria's full commitment to the 3R principle, while at the same time defending animal experiments: "The Austrian Animal Experiments Act thus not only explicitly supports the '3Rs'... but enshrines them in law as a guiding principle for animal experimentation in Austria." The authorities put forward that there were "still considerably fewer animal experiments and laboratory animals in Austria than in other countries", but concede that the number of animals has risen in the last two years. According to the Austrian authorities, this "is due to the increase in biomedical research undertaken by companies carrying out biomedical, bioscientific and pharmaceutical research (in particular in Vienna) in the fight against major diseases, in particular cancer, leukaemia, cardiovascular disease and AIDS... Even with the targeted use of substitute methods, the increased development of medicines and pharmaceuticals makes it absolutely essential to carry out tests on animals as a preliminary to, and a prerequisite for, clinical trials on humans in the interest of human and animal health and safety" (twofold accentuation in text).

Austria provides two possible reasons for the "more than 60% reduction since 1991", a strict application of the 3Rs principle and "restrictive approach and promotion of alternative methods", and points to national funding for alternative method research: "In the past two years, the Science Ministry has made more than € 2.3 million available for commissioning research into the development of substitute procedures to replace animal experiments."

Portugal (page 149) briefly comments on the data and announces preparation of the revision of their national legislation "To add a more precise classification of the level of suffering inflicted to any animal; to make compulsory the existence of an ethical committee at a research center level." Concerning the number of animals used, it is stated: "In 2002, compared to the previous year, there was a growth in the total number of animals used which was due to the increasing of biological studies of a fundamental nature. The species of animals that more contributed to that growth were mice, rats and fish."

Finland (page 158) reports that the total number of animals used remained more or less unchanged: "The large number of fish used (78% of total use) was due to one large project. The total number of used animals was 645,000, with 143,000 animals other than fish." The Finnish authorities further indicate national funding of alternative method research: "The Ministry of Agriculture and Forestry funded in the year 2002 studies on methods to change over from in vivo to alternative methods in research with 34,000€ for 6 projects in Finland. The ministry has also nominated a working group on national and international coordination and cooperation of the use of alternative methods. The Ministry continues preparations on revision of animal welfare legislation on animals used for experimental and scientific purposes."

Sweden (pages 167-169) comments on the data reported and on trends discernible and gives some explanation for specific numbers. Additionally, the Swedish comments make reference to national legislation. Concerning the process of data collection, Sweden explains: "Most university researchers were prompt and submitted their reports in March, although some were as late as May–June despite several reminders from the Swedish National Board for Laboratory Animals (CFN)." Regarding the total number of animals used, a 4% increase compared to 2001 was observed: "The increases were mainly found in the universities, the reason for this can possibly be explained by the fact that two new animal facilities were under construction during the year 2000-2001

and were in full operation first during 2002... From 1990 until 2002 the mean number of laboratory animals used in Sweden was about 315,000 with the highest number 1994 (approx. 351,000) and the lowest 1997 (267,000). The reasons behind these fluctuations are hard to speculate about. It may just be due to natural fluctuations and/or reflect the status of high or low economy in Sweden... The overall decrease that is found in the pharmaceutical industries during the last three years is probably due to the merging between Astra and Zeneca and the fact that Pharmacia has moved all research outside Sweden. It would be of major interest to study EU's total statistics to be able to see if the decreasing numbers in animals in Sweden could be due to an increase in number by the pharmaceutical companies elsewhere."

As to national statistical data, the Swedish authorities remark that they include "all animals used in behaviour studies, feeding trials or animals being euthanized for the use of their tissues and organs... The large increase in the use of birds" (from 2001 to 2002) "can be explained by the fact that the pharmaceutical company, Pharmacia, used roosters, i.e. comb from roosters for the production of hyaloronic acids and that one Swedish university performed a large study on birds feeding behaviour." As regards the funding of research Sweden explains: "In 1999, CFN was active, when providing a Swedish researcher with grants to swift his antibody production from whole animals to *in vitro* techniques".

The **United Kingdom** (pages 178-179) presents an overview of the data collected and provides some explanation for specific numbers. As to the types of procedures, the United Kingdom further specify: "About 40% of the animals used were given some form of anaesthesia to alleviate the severity of the interventions. For most of the remaining animals, the use of anaesthesia would have increased the severity of the procedure. No animals were used in 2002 for the purpose of evaluating the safety of either cosmetic products or cosmetic ingredients. No animals were used in 2002 for monoclonal antibody production using the ascites method."

2 Comments on the fourth EU report on the statistics on the number of animals used for experimental and other scientific purposes

2.1 Numbers of animals used

It is disappointing that more than 10 years after the publication of the first European statistical report on the number of animals used for experimental and other scientific purposes, there is still not complete consistency of the data collected by the Member States. In this context, it is especially exasperating that France, which also was unable to provide data for the correct year for the second statistical report, provides no kind of explanation for this in its comments.

Deficiencies in the design of the EU tables used for compilation of the statistical information since the third report that would compromise the meaningfulness of the data collected had already been commented on at the time of the editing of these tables (Sauer and Kolar, 2000; Sauer et al., 1998). Even though the EU Commission regards the data of the fourth statistical report to enable for the first time a detailed interpretation of the numbers, the deficiencies of the tables remain obvious. For instance, the meaningfulness of Table 4.1 (Number of animals used in experiments for studies on human and animal diseases) is greatly diminished by the fact that more than 40% of the animals listed are classified as having been used to study "other human diseases". And the fact that the national authorities consider the data listed in Table 5.1 (Number of animals used in the production and quality control of products and devices for human medicine and dentistry and for veterinary medicine. Regulatory requirements versus species) to reveal "unclear data reporting" shows that the classifications of this table are considered to be ambiguous.

After a total number of 11.6 and 9.8 Million laboratory animals used in the European Union reported for the years 1996 and 1999 respectively, 10.7 Million animals were counted for the year 2002. While the European Commission interpreted the data for 1999 in comparison to 1996 to reveal a downward trend in laboratory animal use, this conclusion was already questioned at the time of the publication of the third statistical report (Sauer et al., 2003). Unfortunately, these doubts are confirmed by the figures published in the fourth statistical report. Evidently, concrete legal and political measures (for example related to the licensing of animal experiments or to promoting alternative method research) seem necessary to ensure that Article 23(1)[4] of Council Directive 86/609/EEC on the protection of animals used for experimental and other scientific purposes can make an effective contribution to reducing animal experimentation.

It is noteworthy that the increase in the total number of animals used in 2002 compared to 1999 is attributed to an increased use of fish, which occurred in a number of Member States simultaneously, as is also reflected by the comments of the national authorities from Belgium, Denmark, Greece, Ireland, Portugal and Finland. It is to be hoped that the European Commission and the Member States take this observation seriously and intensify adequate measures to strive for replacing fish tests that currently are undertaken for example for ecotoxicological purposes, but also for fundamental biological studies.

In comparison, in the third EU statistical report increases in the numbers reported by several Member States were attributed to an increase in the number of transgenic animals. Nevertheless, also in the fourth statistical report the use of transgenic animals for scientific purposes is specifically mentioned by the national authorities. Obviously this issue requires further attention.

The use of non-human primates has remained constant over the years. This ob-

[4] Article 23(1) of 86/609/EEC: "The Commission and the Member States are to encourage research into the development and validation of alternative techniques which could provide the same level of information as that obtained in experiments using animals, but which involve fewer animals or which entail less painful procedures, and shall take such other steps as they consider appropriate to encourage research in this field. The Commission and Member States shall monitor trends in experimental methods."

servation not only confirms the need to give these animals special consideration during a revision of Council Directive 86/609/EEC. Additionally, from the point of view of animal welfare it is not to be tolerated that the majority of the old world monkeys (and a large proportion of the dogs) used come from places outside the European Union. It cannot be disputed that such animals not only have to endure the distress involved with the long transportation, but that they most likely had been bred and kept in conditions that do not even meet the EU standards, which themselves already do not enable the animals to fulfil their basic physiological needs (Sauer, 2004). In order to overcome this situation, much more stringent criteria should be applied to the acceptance and licensing of experiments with such animal species.

Unfortunately, few authorities comment on the use of non-human primates, with Ireland indicating that in accordance with national policy such animal species are not used at all in this Member State, and France making the totally inapprehensible comment that the frequent non-European origin of old world monkeys is "understandable" and that the conditions of transport are "totally acceptable". Such a conclusion can neither be backed up by practical experience nor by scientific evidence (Ruhdel and Sauer, 1998).

Concerning scientific purposes, it is striking that approximately 4 million (3,728,426 animals or 35%) of the 10.7 million animals reported for the year 2002 were used in biological studies of a fundamental nature. Such studies currently are not covered by the scope of Council Directive 86/609/EEC since they were not considered to be relevant for economic issues at the time of the coming into force of this Directive. However it is becoming increasingly evident that the line to be drawn between fundamental and applied research is not clear and also that fundamental studies oftentimes are performed mainly for economic reasons[5]. Therefore there seems to be no justification to continue to exempt such a high proportion of laboratory animals from protection by EU legislation. The European Commission should take responsibility for all laboratory animals used in the European Union and also include fundamental research under the scope of the Council Directive 86/609[6].

Regarding animal tests performed for the production and quality control of medical products and devices, the question why 20.5% of the animals were used without compliance to any regulatory requirements should be further pursued. The explanation given by the Member States that these tests were performed during early stages in the development of such products or were performed as additional tests to confirm earlier ambiguous test results cannot be considered satisfactory. Companies, which repeatedly report the performance of this kind of testing, should be asked for further clarification regarding the types of tests concerned and the reasons why ambiguous test results have occurred.

Furthermore, it would be advisable that Competent Authorities responsible for the implementation of Council Directive 86/609/EEC further elucidate why over 10% of the animals used in toxicological and other safety evaluations were used to comply with national legislation specific to a single EC Member State. The relevance of these tests and the question whether further harmonisation measures in the European Union might make a contribution to preventing such testing from taking place should be followed up.

More than one million or 10% of the laboratory animals used in the European Union in 2002 were used for toxicological and other safety evaluations, while 9.5% of the laboratory animals were used for this purpose in 1999. These figures are expected to rise considerably once the REACH[7] Regulation implementing the new EU Chemicals Policy will come into force (Höfer et al., 2004) even though the European Commission has laid down the promotion of non-animal testing as one of the key elements of its Chemicals Policy (Commission of the European Communities, 2001) and even though an animal testing ban has been laid down in the 7th amendment of Council Directive 76/768/EEC on the approximation of the laws of the Member States relating to cosmetic products. Therefore such predictions emphasize the need for concrete political efforts to develop, validate and officially accept non-animal test methods and flexible tiered non-animal testing strategies both for toxicological and ecotoxicological endpoints.

2.2 Comments of the national authorities

All national authorities submitted comments alongside their national data. These explanatory notes have become more elaborate in comparison to statements provided in earlier reports. Nevertheless, wide variations in the type of comments submitted can be observed, with these covering overviews on the data submitted, additional explanatory information for specific numbers as well as references to relevant national legislation or to additional points of interest. Apart from Spain, all Member States comment on trends in animal use observed over the years. Additionally, Denmark, Greece, Luxembourg, Austria, Finland, Sweden and the United Kingdom provide some further explanation for specific numbers. Germany, Greece, Spain, Italy, the Netherlands, Austria, Portugal and Sweden make more or less detailed reference to national legislation related to the collection of statistical information or to the protection of laboratory animals. Due to the large variations in respective national legislation and additionally due to the fact that the next statistical report is expected to cover data from all 25 Member States of the new enlarged European Union, all national authorities should be advised to present a brief overview of their national legislation related to the protection of laboratory animals and the collection of statistical data on their use for that report.

Additional points of interest addressed by national authorities cover Germany announcing the establishment of an Expert Group entrusted with the task to identify areas in which animal tests might be reduced or replaced. The

[5] See Deutscher Tierschutzbund (2003). Comments of Deutscher Tierschutzbund on a possible legal basis for the extension of the scope of Council Directive 86/609/EEC.

[6] See also: Technical Expert Working Group for the revision of Directive 86/609/EEC on the protection of animals used for experimental and other scientific purposes. Final Report – Subgroup Scope. November 2003. http://www.europa.eu.int/comm/environment/chemicals/lab_animals/pdf/finalreportscope.pdf

[7] REACH – Registration, Evaluation, Authorisation of Chemicals

Netherlands provide details on the Dutch requirement to classify the discomfort that the animals experience during the procedures after their finalisation. Sweden comments on the purposes those animals were used for that are covered by national but not by the EU statistics. Such comments are to be welcomed since they can make a contribution to stimulating similar issues being taken up by other Member States as well.

Sweden's indication that financial support was provided to a researcher for changing antibody production from whole animals to *in vitro* methods is surprising considering that such methodologies have already been available for many years.

Not only do the contents of the explanatory notes vary, but also their orientation. Germany stresses an active commitment to the Three Rs principle. This is also emphasized very euphemistically by Austria, which speaks out in defence of animal experiments at the same time. France on the other hand not only provides a lengthy statement in support of the continuous performance of animal experiments, but also expresses doubts concerning the applicability of *in vitro* test methods and the contribution they can make to reducing animal use and animal suffering that are not backed up by scientific references.

Germany, Austria, Finland report on providing active financial support to promoting the development of alternative methods. The numbers presented in the fourth EU report on the statistics on the number of animals used for experimental and other scientific purposes show that such support is desperately needed.

References

Note: All websites were accessed between March 1 and 11, 2005.

Commission of the European Communities (1994). First report from the Commission to the Council and the European Parliament on the statistics on the number of animals used for experimental and other scientific purposes in the member states of the European Union. COM (1994) 195 final, Brussels, 27.05.1994. (text not publicly available via internet)

Commission of the European Communities (1999). Second report from the Commission to the Council and the European Parliament on the statistics on the number of animals used for experimental and other scientific purposes in the member states of the European Union. COM (1999) 191 final, Brussels, 26.04.1999. (http://www.europa.eu.int/comm/environment/docum/99191_en.pdf)

Commission of the European Communities (2001). White Paper – Strategy for a future Chemicals Policy. COM(2001) 88final. 36 pp. February 27, 2001. (http://www.europa.eu.int/comm/environment/chemicals/0188_en.pdf)

Commission of the European Communities (2003). Third report from the Commission to the Council and the European Parliament on the statistics on the number of animals used for experimental and other scientific purposes in the member states of the European Union. COM(2003)19 final, Brussels, 22.01.2003. (http://europa.eu.int/eur-lex/en/com/rpt/2003/com2003_0019en01.pdf)

Commission of the European Communities (2005a). Fourth report from the Commission to the Council and the European Parliament on the statistics on the number of animals used for experimental and other scientific purposes in the member states of the European Union. COM (2005) 7 final, Brussels, 20.01.2005. (http://www.europa.eu.int/comm/environment/chemicals/lab_animals/pdf/com_2005_7_en.pdf)

Commission of the European Communities (2005b). Commission Staff Working Document. Annex to the: Report on the statistics on the number of animals used for experimental and other scientific purposes in the member states of the European Union in the year 2002. SEC (2005) 45, Brussels, 20.01.2005. (http://www.europa.eu.int/comm/environment/chemicals/lab_animals/pdf/sec_2005_0045_1.pdf)

Höfer, T., Gerner, I., Gundert-Remy, U. et al. (2004). Animal testing and alternative approaches for the human health risk assessment under the proposed new European chemicals regulation. Arch. Toxicol. 78, 549-564.

Ruhdel, I. W. and Sauer, U. G. (1998). *Primate experimentation. A report on the use, supply and housing conditions of primates used for scientific purposes within the European Union.*, 80 pp. London: European Coalition to End Animal Experiments.

Sauer, U. G. (2004). The revision of European housing guidelines for laboratory animals: Expectations from the point of view of animal welfare. In: The three R's at the beginning of the 21st century. Proceedings of the Fourth World Congress on Alternatives and Animal Use in the Life Sciences. 11-15 August, 2002, New Orleans, Louisiana, USA. *ATLA 32 (Supplement 1)*, 187-190.

Sauer, U. G. and Kolar, R. (2000). Developments in the collection of statistical information on the number of animals used in experiments and other scientific purposes in the European Union. *ATLA 28*, 133-145.

Sauer, U. G., Kolar, R. und Rusche, B. (1998). Neue Tabellen zur Erfassung der Versuchstierzahlen in der Europäischen Union. *ALTEX 15(3)*, 144-146.

Sauer, U. G., Spielmann, H. und Rusche, B. (2003). Dritter EU-Bericht über die Anzahl verwendeter Versuchstiere – Tendenzen, Probleme, Schlussfolgerungen. *ALTEX 20(2)*, 120-123.

Correspondence to

Dr. Ursula Sauer, Dr. Brigitte Rusche
Akademie für Tierschutz
(Animal Welfare Academy)
Spechtstrasse 1
D-85579 Neubiberg
Germany

Prof. Dr. Horst Spielmann
ZEBET (National German Centre for the Documentation and Evaluation of Alternatives to Testing in Animals) at the Federal Institute for Risk Assessment
Diedersdorfer Weg 1
D-12277 Berlin
Germany