Home Office

Annual Statistics of Scientific Procedures on Living Animals Great Britain 2015

HC 555

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Introductory Notes

Animals (Scientific Procedures) Act 1986 and key definitions

In the United Kingdom the use of animals in scientific procedures is regulated by the Animals (Scientific Procedures) Act 1986[1] (ASPA), an animal protection measure that requires licensing and oversight of all places, projects and personnel involved in such work. The general system of control under the 1986 Act is explained in detail in Appendix B.

The purpose of this publication is to meet the requirements of the 1986 Act to collect and publish statistical information on the use of protected animals in regulated procedures during the previous calendar year and to lay that information before Parliament.[2] This release covers Great Britain whilst, for Northern Ireland, the Department of Health separately collects and publishes information on regulated procedures under devolved arrangements.

Protected animals are defined in the 1986 Act[3] as any living vertebrate other than man and any living cephalopod. Regulated procedures are defined in the 1986 Act as "any procedure applied to a protected animal for an experimental or other scientific purpose, or for an educational purpose[4], that may have the effect of causing an animal pain, suffering, distress or lasting harm equivalent to, or higher than, that caused by the introduction of a needle in accordance with good veterinary practice". As the 1986 Act indicates, the breeding of an animal[5] is a regulated procedure if the animal is bred from, or is the descendant of, an animal whose genes have mutated or been modified. For simplicity, these procedures will be referred to from this point on as the creation/breeding of genetically altered animals.

The number of regulated procedures, simply referred to as 'procedures' from this point on, usually corresponds with the number of animals used.[6] However, animals are sometimes 're-used' when they have fully recovered from a previous procedure and in these instances they are counted as separate, additional, procedures. Overall, the number of procedures is always slightly higher than the number of animals used. The figures in this release focus on the number of procedures, not the number of animals, unless otherwise stated.

Changes to data collection from 2014 onwards

The European Directive 2010/63/EU[7] sets out a common format for member states of the European Union, which includes the UK – and therefore Great Britain – to submit information on the use of animals for scientific purposes. Following the transposition of the directive into UK law in January 2013, through amendment regulations to the Animals (Scientific Procedures) Act 1986, some changes were made that affect data from 2014 onwards. The key changes are listed below.

- In order to allow for the collection of data on actual severity of procedures (see below), these data are for procedures *completed*, as opposed to procedures *started,*

[1] The Animals (Scientific Procedures) Act 1986 can be accessed at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/308593/ConsolidatedASPA1Jan2013.pdf.
[2] Sections 21(7), 21A(1) and 21A(2).
[3] Section 1(1). The remainder of section 1 provides greater detail on what protected animals cover.
[4] Sections 2(1) and 2(1A). The remainder of section 2 provides greater detail on what regulated procedures cover.
[5] Section 2(3B).
[6] Specifically, the number of animals used for the first time in procedures. Information on the number of animals re-used is not collected.
[7] See http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0063.

as reported prior to the 2014 publication. Any procedures started and counted in 2013 or earlier, but which were completed on or after 1 January 2014, should have been counted again.

- Details of the actual severity[8] are recorded for all procedures. This is an assessment of the severity that animals experienced as a result of the entire procedure applied and reflects the peak severity of that procedure.
- The species' information collected has been revised (these changes were also in place for 2013).
    - Information on all cephalopods[9] as opposed to only one species (Octupus vulgaris) is now collected, as is information on species newly listed in 2013 in Schedule 2 of the Animal (Scientific Procedures) Act 1986.
    - Data on greyhounds are no longer collected separately; however, since 2015, species information is collected to distinguish beagles from other dogs and common quail from other birds.
- Information on free-feeding larval forms (e.g. tadpoles) is now collected, but unborn or un-hatched embryos are not counted.
- Precise information on the number of individual animals re-used is not collected; however, it is still possible to ascertain the number of procedures which involved the re-use of animals.
- Data are collected on place of birth rather than on source.
    - Greater detail is collected on the place of birth of non-human primates, including on whether non-human primates were wild caught or captive bred. In addition, since 2015, information is now collected to allow for the differentiation between captive bred non-human primates born in the UK and the wider EU.
    - For captive bred non-human primates, information is also collected on the number of generations that they have been bred in captivity.
- For genetically altered animals, separate breakdowns on genetically modified animals and animals with a harmful genetic mutation are not collected; instead, separate breakdowns are collected on animals that show a harmful phenotype (i.e. a harmful physical or biochemical defect) and animals which do not show a harmful phenotype.
- Data are no longer collected on use of anaesthesia, except where neuromuscular blocking agents (NMBA) are involved.
- Information on target body system is no longer collected for all procedures but similar data are collected for procedures undertaken for basic and translational research purposes.
- Specific information is collected on regulatory (as opposed to non-regulatory) use; some of this information was previously reported as applied studies.

[8] The classification of severity followed the guidelines given in Annex 8 of European Directive 2010/63/EU, which the Home Office further interpreted in "Advisory notes on recording and reporting the actual severity of regulated procedures". See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276014/NotesActualSeverityReporting.pdf.

[9] Marine invertebrate animals such as an octopus or squid.

- Fundamental toxicological research, method development, and those safety-related procedures, for which there is no regulatory requirement, are reported under translational/applied research.

Data quality

To gain a better understanding of the impact of the changes to the data collection last year, Home Office statisticians produced an online feedback questionnaire for data suppliers. Based on responses from 118 suppliers (which may not be representative), there was evidence to confirm that the transition to the new reporting system between 2013 and 2014 was problematic for some respondents.

- Almost two-thirds omitted in their 2014 data return some procedures started prior to 2014 and completed in 2014.
- Around half confused the number of animals with the number of procedures in some cases.
- Around one-third confused creating a new genetic line with maintenance of genetically altered animals in some cases.

In light of feedback from the questionnaire, Home Office statisticians improved the format of the data collection template making it easier for data suppliers to view and adjust the fields, and identify the appropriate drop-down options for those fields. They also improved the labelling and descriptions in the template and provided a link to the accompanying guidance notes. In addition, the guidance notes were improved in terms of clarity and further examples were provided to aid data suppliers.

As a result of these improvements, Home Office statisticians expect the 2015 data to be more robust than the 2014 data. For further details on the feedback questionnaire, see the user guide.

For the first time in 2014, details on the severity of procedures were recorded and, as a result, it is likely that there was some misclassification in the reporting of severity data for that year. The misclassification is still likely to be present to some extent in the 2015 data, although it is expected that over time this will reduce as data suppliers become more familiar with the new reporting requirements. The Home Office provided additional clarification throughout the 2015 data collection period to all stakeholders on severity assessment and scoring. Given that severity information has only been available since 2014, clear trends for this data will take several years to emerge.

Following changes to the reporting format from 2014 onwards, procedures are now counted when they are completed as opposed to when they started, as in 2013 and previous years. As discussed in the 2014 report, it is believed that this transition led to an under-reporting of procedures that had already been counted in 2013 but which were completed in 2014; this is supported by the feedback from the questionnaire. This one-off undercount was largely responsible for the 6% reduction in procedures counted in 2014 compared to 2013. This transitional effect is unlikely to have any notable impact on data collected from 2015 onwards, as only a very small number of procedures are likely to extend over more than one year.

Therefore, generally throughout this release, 2015 data are compared with 2013 data, as neither year of data are subject to the same data quality issues as the 2014 data. However, comparisons between 2015 and 2013 should still be exercised with a degree of caution due to the methodological change in 2014.

Presentation

There may appear to be small discrepancies between totals and the sums of related breakdowns in some instances for figures in this report. These discrepancies are attributable to rounding.

Rounding was employed to simplify the presentation of figures. However, all numeric changes across years, percentage changes across years and percentages are based on unrounded data, which are available in the data tables. The rounding conventions, which also ensure that a sufficient level of detail is still presented, are as follows.

- All figures in millions are presented as millions and rounded to two decimal places, e.g. 2,121,582 would be presented as 2.12 million.
- All figures less than a million but greater than 10,000 are presented as whole numbers and rounded to the nearest thousand, e.g. 343,465 would be presented as 343 thousand.
- All figures less than 10,000 but greater than 1,000 are presented as whole numbers to the nearest 100, e.g. 8,465 would be presented as 8,500.
- All figures less than a thousand but greater than 10 are presented as whole numbers and rounded to the nearest 10, e.g. 49 would be presented as 50.
- All figures less than 10 are presented as unrounded whole numbers.
- All percentages greater than 1% are presented to the nearest per cent. All percentages less than 1% are rounded to the nearest significant figure, e.g. 1.43% would be presented as 1%, 0.43% would be presented as 0.4%, and 0.043% would be presented as 0.04%.

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007, signifying compliance with the Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods; and
- are managed impartially and objectively in the public interest.

Once statistics are designated as National Statistics, it is a statutory requirement that the Code of Practice shall continue to be observed.

This National Statistics output has been produced to the highest professional standards and free from political interference. It has been produced by Home Office statisticians working in the Chief Statistician's Unit in accordance with the 'Home Office's Statement of Compliance with the Code of Practice for Official Statistics'. The Chief Statistician, as Head of Profession, reports to the National Statistician with respect to all professional statistical matters and oversees all Home Office National Statistics products with respect to the Code, being responsible for their timing, content and methodology.

Summary

Introduction

Following the transposition of European Directive 2010/63/EU into UK law through amendment regulations to the Animals (Scientific Procedures) Act 1986, some changes were applied to the 2014 collection. The 2015 figures in this release are the second year for which these changes apply. In particular, information is now collected on procedures completed, not procedures started, as for previous publications. This now enables details on the actual severity of procedures to be collected.

Comparison between the 2015 and 2014 data should be exercised with caution due to some under-reporting and misclassification in 2014 (see introductory notes, data quality section). As a result, 2015 data are compared with 2013 data, as neither year of data are subject to the same data quality issues as the 2014 data. Comparisons with 2014 data are made for severity as information on the actual severity of procedures was not collected prior to 2014, and are only made in percentage terms due to the data quality issues for that year.

Total procedures

(See data table 1)

In 2015, a total of 4.14 million procedures were completed. Of those, 2.08 million (50%) were experimental procedures[10] and 2.06 million (50%) related to the creation/breeding of genetically altered animals[11] that were not used in further experimental procedures.

Between 2006 and 2013, the total number of procedures increased by 37% (1.11 million procedures). The creation/breeding of genetically altered animals primarily accounted for this rise (1.00 million procedures) whilst the increase in the number of experimental procedures was much smaller (107 thousand procedures). When comparing 2015 with 2013:[12]

- the total of 4.14 million procedures in 2015 represents an increase of 1% or 21 thousand procedures compared with 2013;
- the 2.08 million experimental procedures in 2015 represents an increase of 3% or 63 thousand procedures compared with 2013;
- the 2.06 million genetically altered animals created/bred but not used in further procedures in 2015 represents a decrease of 2% or 41 thousand procedures compared with 2013.

[10] Experimental procedures includes all animals used in basic research, regulatory use, translational/applied research, protection of the natural environment, higher education and training, preservation of species and forensic enquiries. It excludes the use of animals for the creation of new lines of genetically altered animals and the breeding of established lines of genetically altered animals that were not used in further regulated procedures.

[11] The creation/breeding of genetically altered animals includes the use of animals for the creation of new lines of genetically altered animals and the breeding of established lines of genetically altered animals that were not used in further regulated procedures. This category also includes some animals that were bred with the intention of producing genetically altered animals, but resulted in non-genetically altered animals being born (7% of procedures involving the creation/breeding of genetically altered animals in 2015).

[12] For details regarding the comparison with 2013, see introductory notes, data quality section.

Figure 1: Total number of procedures by experimental procedures and creation/breeding of genetically altered animals, 2006 to 2015

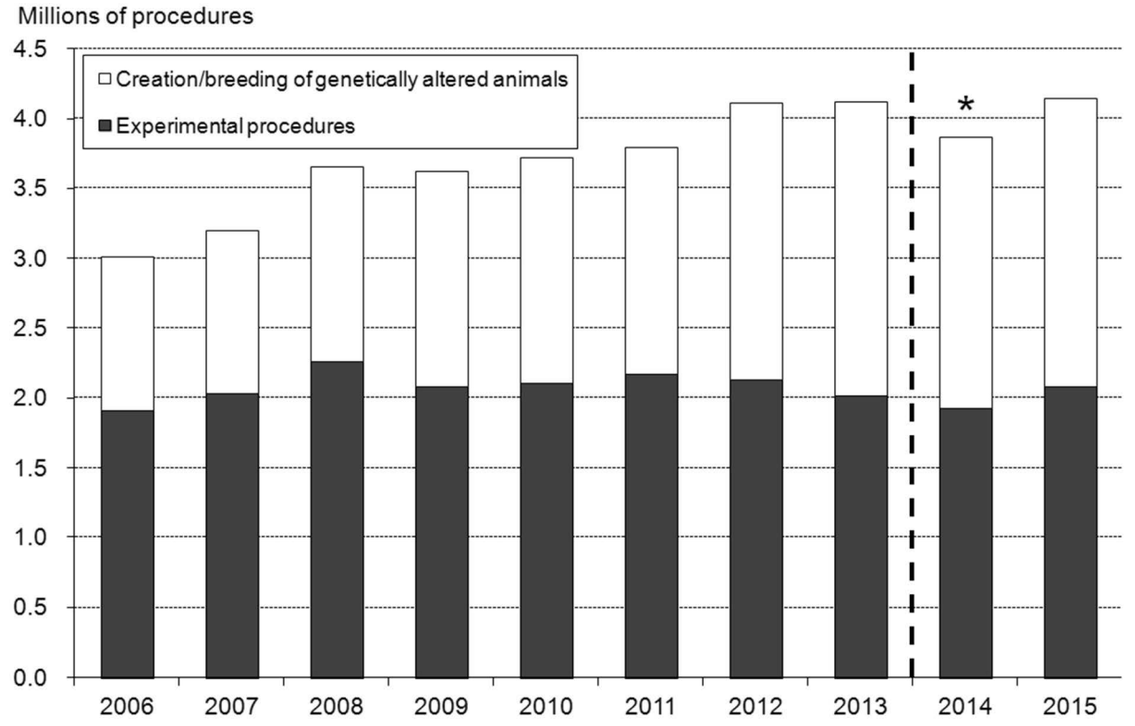


Chart notes:
* The data collection methodology changed in 2014, which resulted in some under-reporting for that year (see introductory notes for more information).

Experimental procedures

(See data tables 1 and 3)

Of the 2.08 million experimental procedures completed in 2015, the majority involved mice (61% or 1.26 million procedures), fish (14% or 294 thousand procedures), rats (12% or 258 thousand procedures) and birds (7% or 141 thousand procedures). Experimental procedures involving specially protected species (i.e. horses[13], dogs, cats, and non-human primates) accounted for 0.8% (17 thousand) of procedures in 2015.

[13] Includes donkeys and cross-bred horses.

Figure 2: Experimental procedures by species, 2015

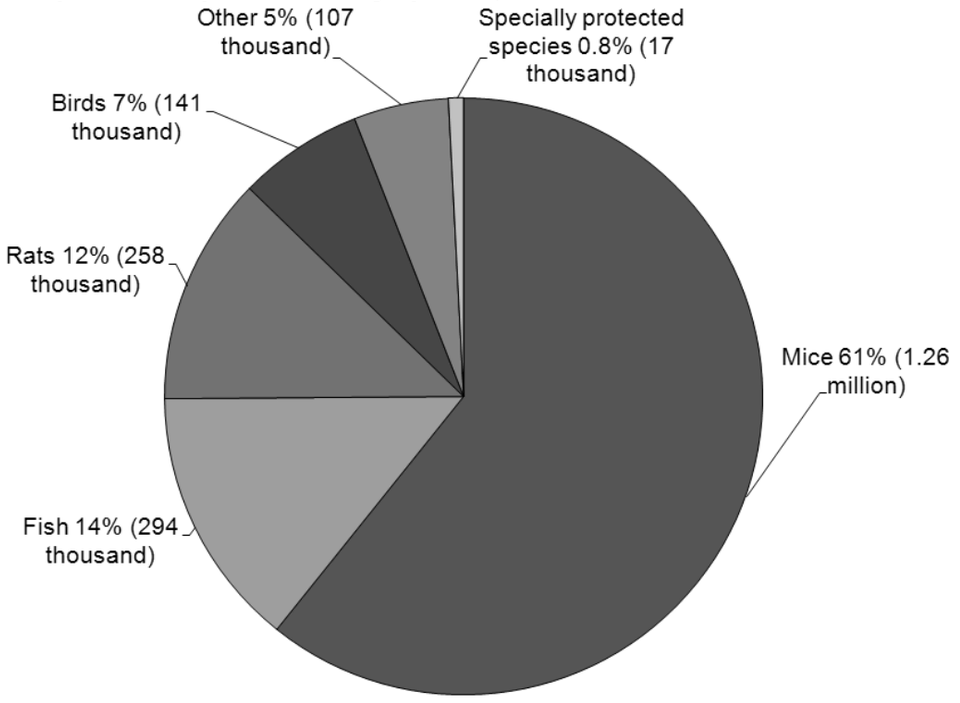


Chart notes:
Specially protected species are horses (8,400 procedures), dogs (4,600 procedures), non-human primates (3,600 procedures) and cats (210 procedures).

Comparing 2015 with 2013[14] by species, there were notable changes to the number of experimental procedures involving:

- fish, up 14% (35 thousand), to 294 thousand procedures in 2015;
- amphibians, up 15% (1,300) to 10 thousand procedures in 2015;
- primates, up 12% (380) to 3,600 procedures in 2015;
- guinea pigs, down 17% (-4,500) to 22 thousand procedures in 2015.

Of the severity assessments undertaken for the 2.08 million experimental procedures completed in 2015:

- 13% (268 thousand) were assessed as sub-threshold (compared with 9% in 2014);
- 6% (123 thousand) were assessed as non-recovery[15] (compared with 7% in 2014);
- 51% (1.06 million) were assessed as mild (compared with 51% in 2014);
- 24% (502 thousand) were assessed as moderate (compared with 25% in 2014);
- 6% (123 thousand) were assessed as severe (compared with 8% in 2014).

[14] For details regarding the comparison with 2013, see introductory notes, data quality section.
[15] Non-recovery procedures are procedures performed entirely under general anaesthesia from which the animal does not recover consciousness.

Creation/breeding of genetically altered animals

(See data tables 1 and 8)

Of the 2.06 million procedures in 2015 relating to the creation/breeding of genetically altered animals that were not used in further procedures, nearly all involved mice (86% or 1.77 million procedures), zebrafish (13% or 267 thousand procedures), rats (1% or 11 thousand procedures), and Xenopus (0.4% or 9,200 procedures).

Of the severity assessments undertaken for these 2.06 million procedures:

- 55% (1.13 million) were assessed as sub-threshold (compared with 46% in 2014);
- 0.2% (3,300) were assessed as non-recovery (compared with 0.1% in 2014);
- 39% (806 thousand) were assessed as mild (compared with 48% in 2014);
- 3% (65 thousand) were assessed as moderate (compared with 4% in 2014);
- 3% (62 thousand) were assessed as severe (compared with 2% in 2014).

Commentary

Introduction

Following the transposition of European Directive 2010/63/EU into UK law through amendment regulations to the Animals (Scientific Procedures) Act 1986, some key changes were made to the 2014 collection. The 2015 figures in this release are the second year for which these changes apply. In particular, information is now collected on procedures completed, not procedures started, as for previous publications. This now enables details on the actual severity of procedures to be collected.

Comparison between the 2015 and 2014 data should be exercised with caution due to some under-reporting and misclassification in 2014. As a result, 2015 data are compared with 2013 data, as neither year of data are subject to the same data quality issues as the 2014 data. Comparisons with 2014 data are made for severity as information on the actual severity of procedures was not collected prior to 2014, and are only made in percentage terms because of the data quality issues for that year.

Total procedures

Introduction

(See data tables 1 and 1a)

In 2015, a total of 4.14 million procedures were completed. This represents an increase of 1% or 21 thousand procedures compared with 2013.[16]

There were 4.07 million animals used for the first time in procedures completed in 2015, representing an increase of 1% (52 thousand animals) compared with 2013.

Of the 4.14 million scientific procedures completed in 2015, 140 thousand involved the re-use of animals. It is no longer possible to ascertain the number of animals re-used given the changes to the collection in 2014 (see section on changes to data collection from 2014 onwards in the introductory notes).

Figure 3 shows that the number of experiments increased considerably from 1945 (when figures were first collected) to 1971, rising from 1.18 million to 5.61 million overall. Subsequently, the number generally declined, falling to 3.11 million in 1986. The implementation of the Animals (Scientific Procedures) Act 1986 changed the methodology of the collection from experiments to procedures[17] and in 1987 data were collected based on both measures, the combined figure being 3.63 million experiments/procedures.

From 1988 onwards, only data for procedures were collected and in the following years the number generally decreased, falling to 2.62 million in 2001. This was mainly due to a reduction in the use of rodents, rabbits and birds (although there was an increase in the number of procedures involving fish). Since then, the number of procedures has risen (reaching 4.12 million in 2013), primarily due to an increase in the creation/breeding of genetically altered

[16] For details regarding the comparison with 2013, see introductory notes, data quality section.
[17] The Cruelty to Animals Act 1876 covered all animals that were used in experiments, i.e. a procedure of unknown outcome. The Animals (Scientific Procedures) Act 1986 has a broader definition as it includes all scientific procedures that may cause pain, suffering, distress or lasting harm. Therefore, the methodological change accounted for the increase in figures from 1987 onwards.

animals, with mice mainly accounting for the rise.

The overall level of scientific procedures is determined by a number of factors, including the economic climate and global trends in scientific endeavour. In recent years, while many types of research have declined or even ended, the advent of modern scientific techniques has opened up new research areas, with genetically altered animals, mainly mice, often being required to support these areas.

Figure 3: Total experiments/procedures, 1945 to 2015

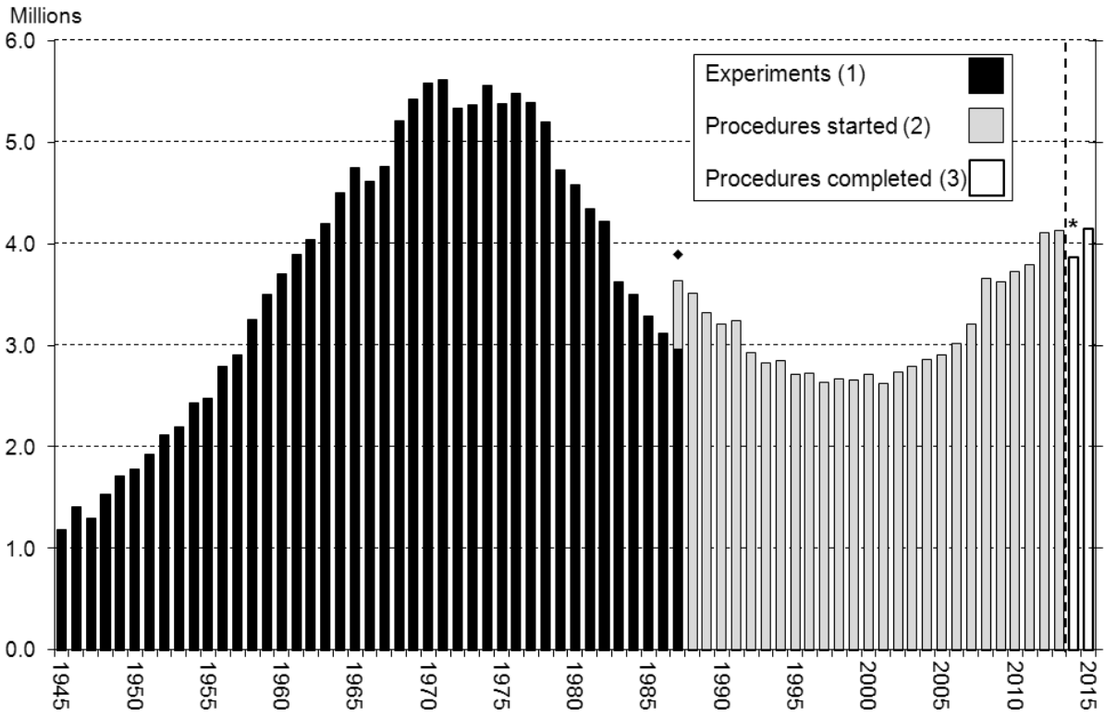


Chart notes:
(1) Experiments **started** under the Cruelty to Animals Act 1876.
(2) Scientific Procedures **started** under the Animals (Scientific Procedures) Act 1986.
(3) Following the transposition of European Directive 2010/63/EU into UK law, scientific procedures **completed** under the revised Animals (Scientific Procedures) Act 1986.
◆ The 1987 total includes experiments started under the 1876 Act as well as procedures started under the 1986 Act.
* The data collection methodology changed in 2014, which resulted in some under-reporting for that year (see introductory notes for more information).

Purpose

(See data table 1)

In 2015, a total of 4.14 million procedures were completed. Of those, as Figure 4 shows, 2.08 million procedures (50%) were undertaken for experimental purposes. The remaining 2.06 million (50%) were to create/breed genetically altered animals that were not used in further procedures (genetically altered animals created/bred and subsequently used in further procedures are reported under experimental procedures). Of the 2.08 million procedures (50%) used for experimental purposes:

- 1.10 million (27% of the total 4.14 million procedures) were undertaken for basic research;[18]
- 556 thousand (13% of the total 4.14 million procedures) were undertaken for regulatory use;[19]
- 402 thousand (10% of the total 4.14 million procedures) were undertaken for translational/applied research;[20]
- 20 thousand (0.5% of the total 4.14 million procedures) were undertaken for other purposes.[21]

Figure 4: Total procedures by purpose, 2015

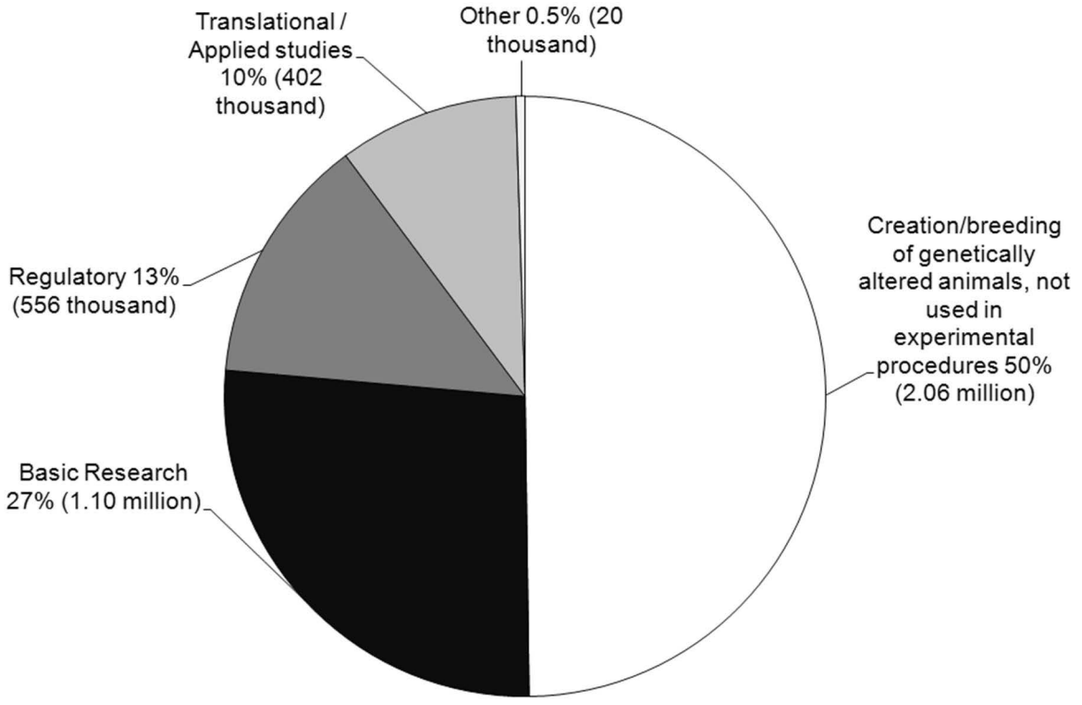


Figure 5 shows that, between 2006 and 2013, the total number of procedures increased by 37% (1.11 million procedures). The breeding of genetically altered animals primarily accounted for this rise (1.00 million procedures) whilst the increase in the number of experimental procedures was much smaller (107 thousand procedures).

Over the past decade, the proportion of procedures accounted for by the breeding of genetically altered animals rose from 37% in 2006 to 50% in 2015. For experimental

[18] Studies that are designed to add knowledge about the normal and abnormal structure, functioning and behaviour of living organisms and the environment. These include fundamental studies in toxicology.
[19] All procedures carried out to satisfy legal requirements including the production of substances to legal specification, such as material for diagnostic tests (e.g. blood products), studies to evaluate the safety or effectiveness of pharmaceuticals and studies to evaluate the safety of other chemicals.
[20] Studies that are designed to address human or animal disease including development of drugs and treatments but excluding studies carried out for regulatory purposes.
[21] Other procedures cover protection of the environment (17 thousand procedures or 0.4% of all procedures), higher education or training (2,000 or 0.05% of all procedures), preservation of species (850 procedures or 0.02% of all procedures), and forensic enquiries (30 procedures or 0.001% of all procedures).

procedures, the proportion involving the use of genetically altered animals over the same period increased from 24% in 2006 to 35% in 2015.

When comparing 2015 with 2013:[22]

- the total of 4.14 million procedures in 2015 represents an increase of 1% or 21 thousand procedures compared with 2013;
- the 2.08 million experimental procedures in 2015 represents an increase of 3% or 63 thousand procedures compared with 2013;
- the 2.06 million genetically altered animals created/bred but not used in further procedures in 2015 represents a decrease of 2% or 41 thousand procedures compared with 2013.

Figure 5: Total procedures by creation/breeding of genetically altered animals and experimental procedures, 2006 to 2015

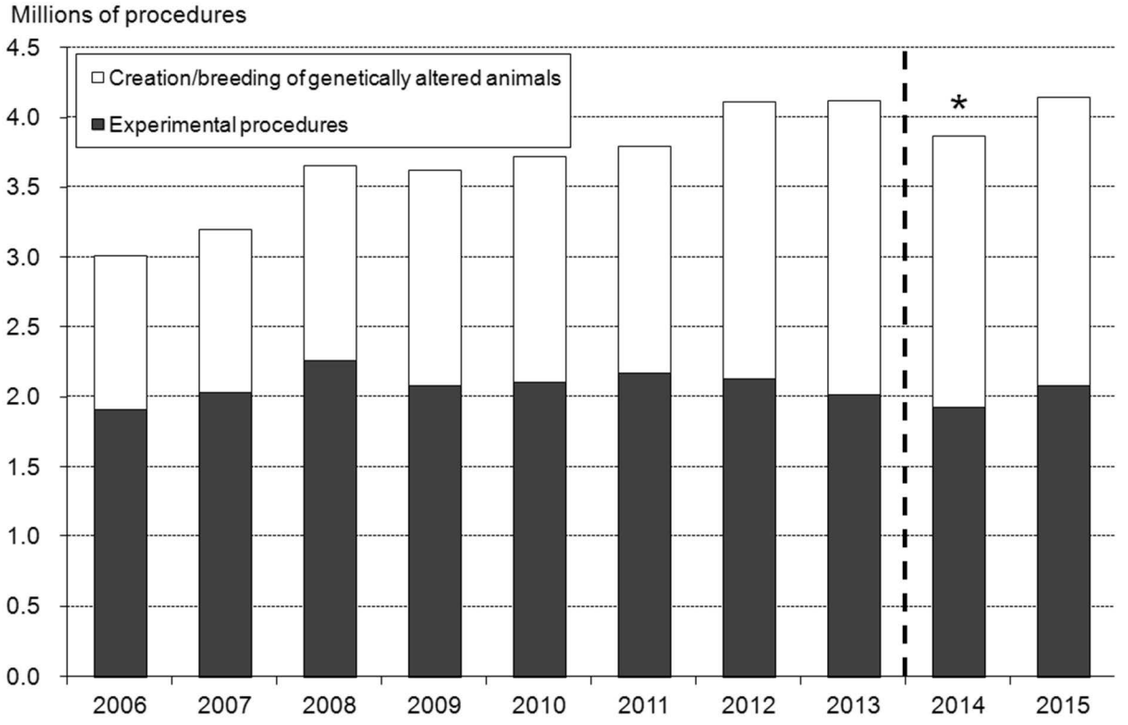


Chart notes:
* The data collection methodology changed in 2014, which resulted in some under-reporting for that year (see introductory notes for more information).

Type of establishment

(See data table 11)

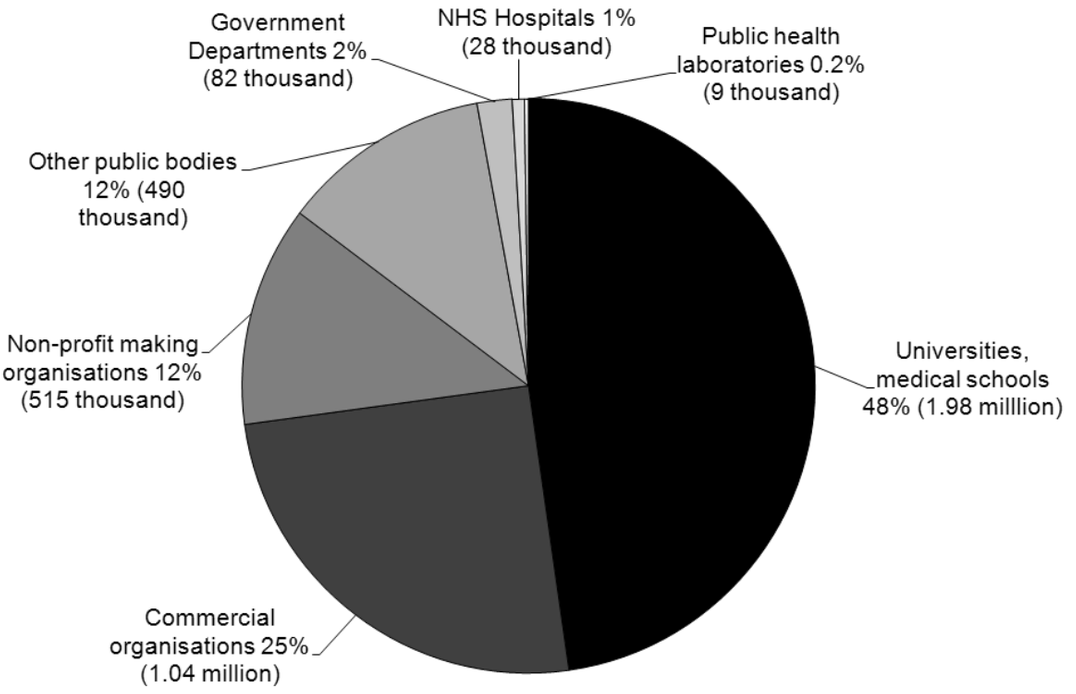
Of the total 4.14 million procedures completed in 2015, as Figure 6 shows:

- universities accounted for 48% (1.98 million) and held 78% of the 3,173 project licences;
- commercial organisations accounted for 25% (1.04 million) and held 7% of project licences;

[22] For details regarding the comparison with 2013, see data quality section in the introductory notes.

- non-profit organisations accounted for 12% (515 thousand) and held 5% of project licences;
- other public bodies accounted for 12% (490 thousand) and held 6% of project licences.

Figure 6: Total procedures by establishment type, 2015



Severity

(See data tables 3.1 and 8)

This is the second year for which information has been collected on the actual severity of procedures (see section on changes to data collection from 2014 onwards in the introductory notes). It is likely that there were some inconsistencies in the interpretation and reporting of severity, which is still a novel process in the UK. The Home Office expects that over time the reporting of this information will become more consistent as data suppliers become more familiar with the new reporting requirements.

The severity of procedural harms (i.e. excluding harms caused to animals as a result of non-procedural events such as transport and housing) is assessed as one of five categories below.

- **Sub-threshold**: When a procedure was authorised under a project licence but did not actually cause suffering above the threshold of regulation (ASPA Section 2(1)), i.e. was less than the level of pain, suffering, distress or lasting harm that is caused by inserting a hypodermic needle according to good veterinary practice.
- **Non-recovery (under general anaesthesia)**: When the entire procedure was carried out under general anaesthesia without recovery.
- **Mild**: The key characteristic of mild procedures is that any pain or suffering experienced by an animal is, at worst, only slight or transitory and minor so that the animal returns to its normal state within a short period of time.

- **Moderate**: The characteristic of moderate procedures is that they do cause a significant and easily detectable disturbance to an animal's normal state, but this is not life threatening. Most surgical procedures carried out under general anaesthesia and with good post-operative analgesia (i.e. pain relief) would be classed as moderate.
- **Severe**: The characteristics of severe procedures are that they cause a major departure from the animal's usual state of health and well-being. It would usually include long-term disease processes where assistance with normal activities such as feeding and drinking are required or where significant deficits in behaviours/activities persist. It includes animals found dead unless an informed decision can be made that the animal did not suffer severely prior to death.

Full details of severity assessment and classification are found in Annex 8 of the European Directive and in the Home Office guidance notes.[23]

Of the 2.08 million experimental procedures completed in 2015:

- 13% (268 thousand) were assessed as sub-threshold (compared with 9% in 2014);
- 6% (123 thousand) were assessed as non-recovery[24] (compared with 7% in 2014);
- 51% (1.06 million) were assessed as mild (compared with 51% in 2014);
- 24% (502 thousand) were assessed as moderate (compared with 25% in 2014);
- 6% (123 thousand) were assessed as severe (compared with 8% in 2014).

Of the 2.06 million genetically altered animals created/bred in 2015, as Figure 7 shows, the severity assessments overall were lower than those given for experimental procedures:

- 55% (1.13 million) were assessed as sub-threshold (compared with 46% in 2014);
- 0.2% (3,300) were assessed as non-recovery (compared with 0.1% in 2014);
- 39% (806 thousand) were assessed as mild (compared with 48% in 2014);
- 3% (65 thousand) were assessed as moderate (compared with 4% in 2014);
- 3% (62 thousand) were assessed as severe (compared with 2% in 2014).

[23] See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276014/NotesActualSeverityReporting.pdf.

[24] Non-recovery procedures are procedures performed entirely under general anaesthesia from which the animal does not recover consciousness.

Figure 7: Severity assessments by experimental procedures and creation/breeding of genetically altered animals, 2014 and 2015

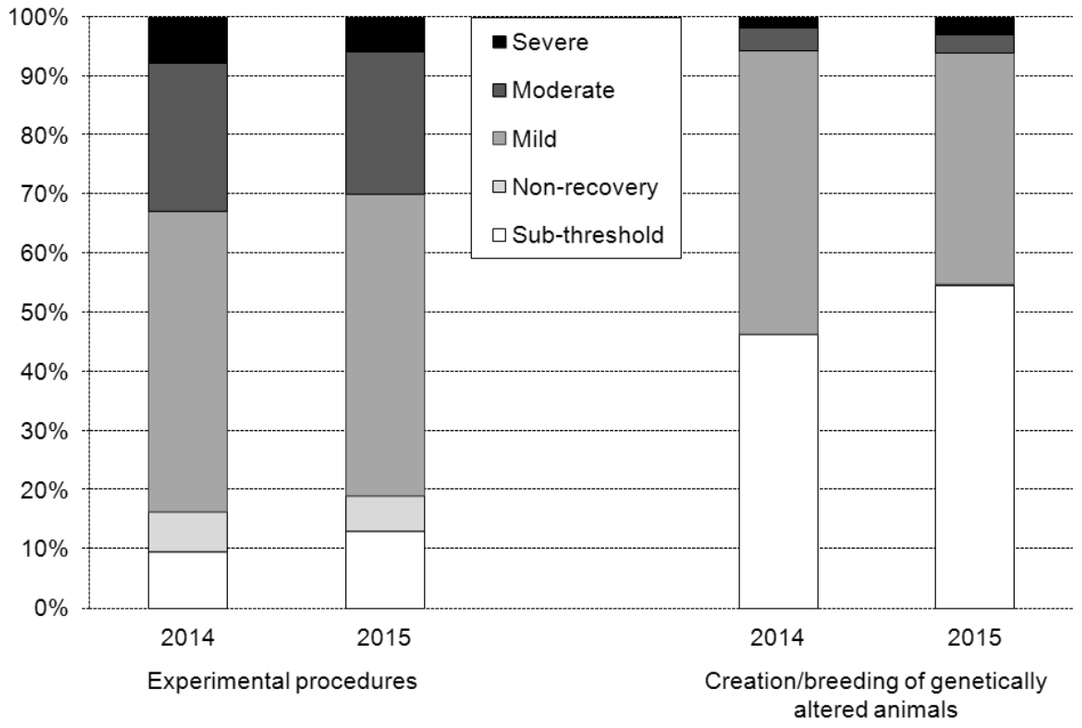


Chart notes:
2015 is the second year in which information on severity assessments has been collected and the severity data should be interpreted with caution (see introductory notes for more information).

The severity of genetically altered animals created/bred is assessed from:

- the phenotype of the animals, e.g. development of congenital disease (i.e. diseases present at birth) or tumours;
- in the case of animals that have no harmful phenotype but that have been biopsied specifically for genotyping,[25] the biopsy procedures will generally be assessed as mild;
- the animals assessed as severe in this category are largely animals within breeding colonies that were found dead and where the death of the animal was either a result of its phenotype or, more commonly, unexplained (all animals found dead are reported as severe unless an informed decision can be made that the animal did not suffer severely prior to death);
- a small number of the animals used to create new lines of genetically altered animals will have been subjected to surgical or minor procedures such as the injection of drugs; these will be classed as moderate.

[25] Genotyping is the process of taking a sample of tissue (a biopsy) and then testing it to determine the genetic make-up of an animal.

Experimental procedures

(See data tables 1 to 7.4)

Introduction

Experimental procedures include all animals used in basic research, regulatory use, translational/applied research, protection of the natural environment, higher education and training, preservation of species, and forensic enquiries. It excludes the use of animals for the creation of new lines of genetically altered animals and the breeding of established lines of genetically altered animals that were not used in further regulated procedures. However, experimental procedures do include genetically altered animals that were used in regulated procedures.

Species used in experimental procedures

(See data table 1)

As Figure 8 shows, of the 2.08 million experimental procedures completed in 2015:

- mice accounted for 61% (1.26 million procedures);
- fish[26] 14% (294 thousand procedures);
- rats 12% (258 thousand procedures);
- birds[27] 7% (141 thousand procedures);
- other species[28] 5% (107 thousand procedures).

Experimental procedures involving specially protected species (i.e. horses,[29] dogs,[30] cats, and primates[31]) accounted for 0.8% (17 thousand) of experimental procedures in 2015. Of those, horses accounted for 0.4% (8,400) of all experimental procedures, dogs 0.2% (4,600), primates 0.2% (3,600) and cats 0.01% (210).

Comparing experimental procedures for 2015 with 2013:[32]

- There were increases in experimental procedures involving:
  - fish, up 14% (35 thousand) to 294 thousand procedures in 2015;
  - amphibians, up 15% (1,300) to 10 thousand procedures in 2015;
  - primates, up 12% (380) to 3,600 procedures in 2015;
  - ferrets, up 46% (200) to 630 procedures in 2015.

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[26] Data on all fish species are grouped together here but data on zebrafish and other fish species are collected and published separately.
[27] Data on all bird species are grouped together here but data on domestic fowl, common quail and other bird species are collected and published separately.
[28] Includes guinea pigs, Syrian hamsters, Chinese hamsters, Mongolian gerbils, all other rodents, rabbits, ferrets, all other carnivores, pigs, goats, sheep, cattle, all other mammals, reptiles, Rana temporaria and pipiens, Xenopus laevis and tropicalis and all other amphibians. This information is grouped together here but data on these species are collected and published separately.
[29] Includes donkeys and cross-bred horses.
[30] Data on all dog species are grouped together there but data on beagles and other dog species are collected and published separately.
[31] Data on all primate species are grouped together here but data on cynomolgus monkeys, rhesus monkeys and marmosets and tamarins are collected and published separately.
[32] For details regarding the comparison with 2013, see introductory notes, data quality section.

- There were decreases in experimental procedures involving:
  - guinea pigs, down 17% (-4,500) to 22 thousand procedures in 2015;
  - hamsters, down 20% (-380) to 1,500 procedures in 2015;
  - gerbils, down 55% (-340) to 280 procedures in 2015.
- No procedures involved the use of reptiles in 2015 whereas 700 procedures did in 2013.
- Whilst experimental procedures involving ungulates[33] increased by only 2% (up 880 to 55 thousand procedures) – a smaller change than for other species groupings – it included:
  - a rise of 50% for procedures involving pigs (up 1,800 to 5,500 procedures);
  - a rise of 2% for procedures involving sheep (up 790 to 47 thousand procedures);
  - a fall of 27% for procedures involving cattle (down 1,200 to 3,200 procedures);
  - a fall of 85% for procedures involving goats (down 580 to 100 procedures).

Figure 8: Experimental procedures by species, 2015

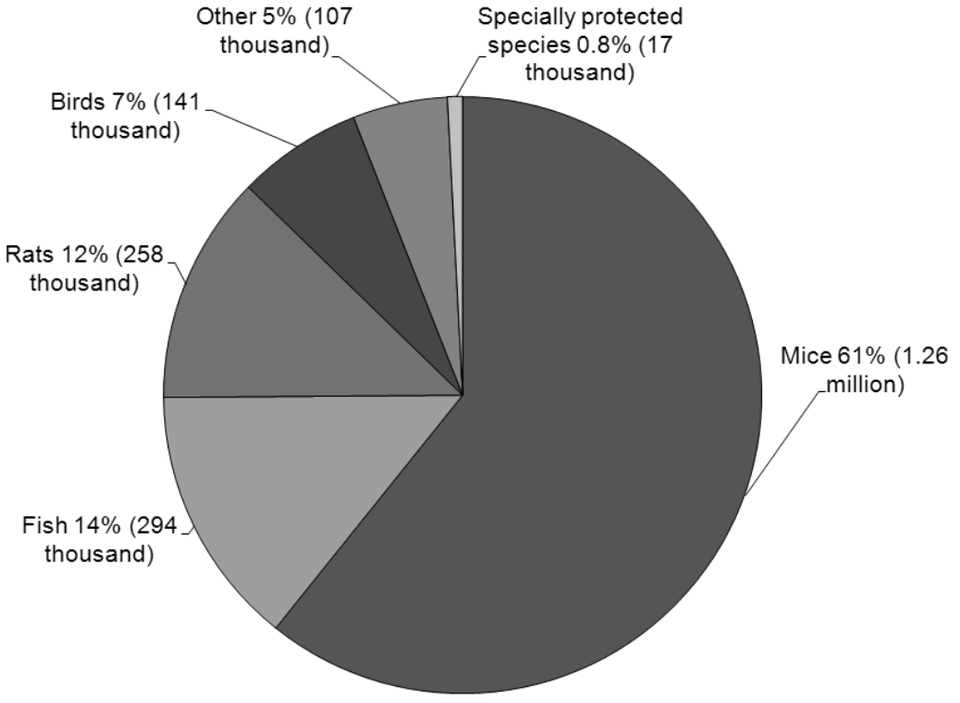


Chart notes:
Specially protected species are horses (8,400 procedures), dogs (4,600 procedures), non-human primates (3,600 procedures) and cats (210 procedures).

[33] Data on ungulates are grouped together here but data on pigs, goats, sheep and cattle are collected and published separately.

Use of mice, rats, and fish in experimental procedures

(See data table 1)

Figure 9 below shows trends in the number of procedures involving the three most commonly used species (mice, rats and fish). The number of procedures involving mice, the most frequently used species of the three throughout the series, rose overall from 1.05 million in 2006 to 1.25 million in 2013. The figure then rose by 0.8% between 2013 and 2015 to 1.26 million procedures.

The number of procedures involving rats consistently fell between 2006 and 2013, decreasing from 389 thousand to 236 thousand procedures. Subsequently, the figure then rose by 9% to 258 thousand procedures in 2015.

The number of procedures involving fish varied between 2006 and 2013, ranging from 207 thousand in 2006 to 482 thousand in 2008. Compared with 2013, the number of procedures involving fish increased by 14% to 294 thousand in 2015.

The availability of genetically altered zebrafish has led to an increase in the use of this species in basic and applied biomedical research. This is reflected in data on the use of zebrafish now being separately collected from other fish species, following the inclusion of zebrafish in Schedule 2 of the Animal (Scientific Procedures) Act 1986. In 2015, zebrafish accounted for 50% (148 thousand) of all experimental procedures on fish.

Figure 9: Experimental procedures involving mice, rats and fish, 2006 to 2015

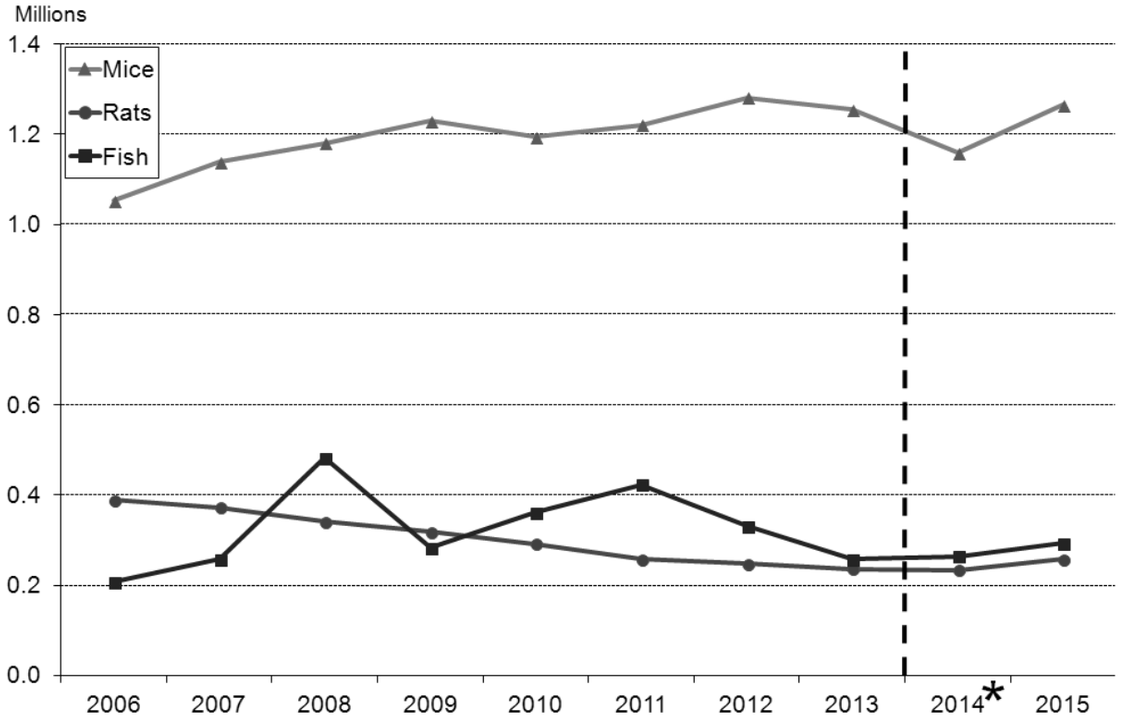


Chart notes:
* The data collection methodology changed in 2014, which resulted in some under-reporting for that year (see introductory notes for more information).

Use of primates in experimental procedures

(See data table 1)

Figure 10 shows trends in the number of procedures involving Old World and New World monkeys from 2006 to 2015. The use of Old World monkeys has been more common throughout the period. Old World monkeys, which are predominately used for regulatory purposes, are considered more relevant models for some human conditions compared with New World monkeys. Since 2013, for Old World monkeys, separate breakdowns have been collected for cynomologus macaques and rhesus macaques.

From 4,200 procedures in 2008, the use of Old World monkeys then fell to 2,100 procedures in 2011. Subsequently, the figure rose to 2,900 in 2013. Since then, the figure has risen by 19% to 3,500 procedures in 2015.

The number of procedures involving the use of New World monkeys rose from 370 procedures in 2008 to 1,100 procedures in 2010. Changing patterns of research have led to a decline in their use, as seen by the numbers falling overall to 310 procedures in 2013, followed by a 57% decrease to 130 procedures in 2015.

Figure 10: Experimental procedures involving Old World and New World monkeys, 2006 to 2015

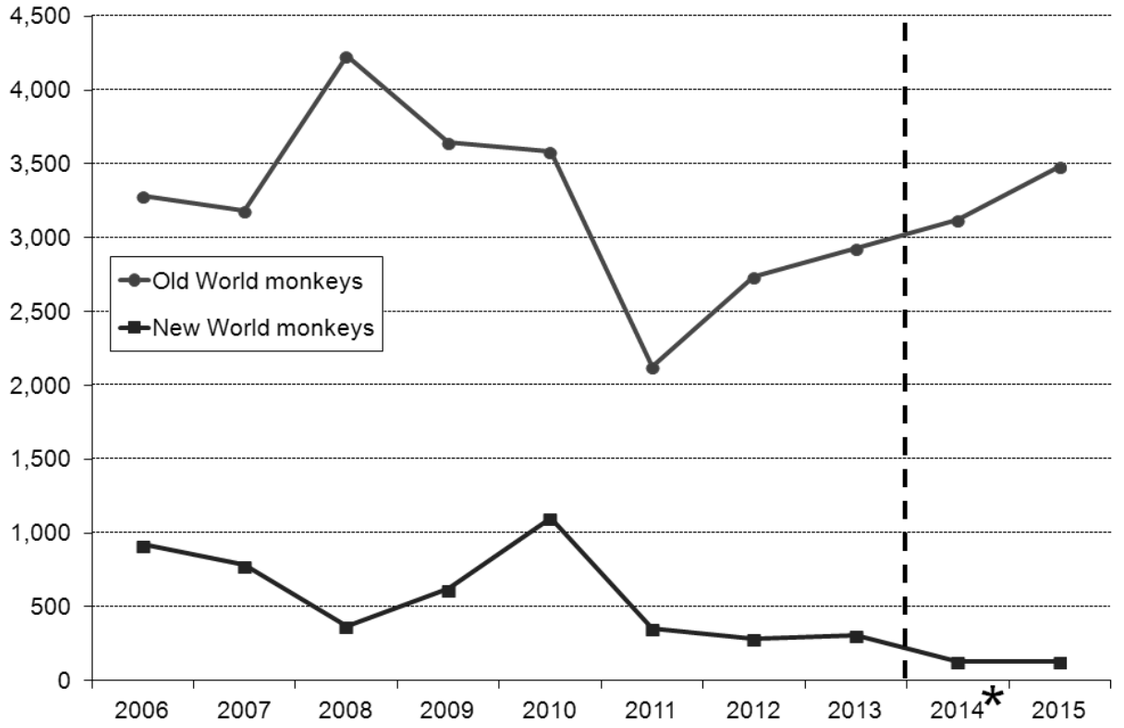


Chart notes:
Throughout the period, New World monkeys used in procedures were marmosets and tamarins, and Old World monkeys used were cynomologus macaques and rhesus macaques.
* The data collection methodology changed in 2014, which resulted in some under-reporting for that year (see introductory notes for more information).

Species on which no experimental procedures were completed in 2015

(See data table 1)

In 2015, there were no experimental procedures completed involving:

- Chinese hamsters;
- a number of primate species (no great apes have been used since the current legislation (the 1986 Act) was implemented in 1987 and the use of great apes has not been permitted since 2013);
- common quail;
- reptiles;
- cephalopods[34].

Place of birth and generation of animals used in experimental procedures

(See data tables 2.1 to 2.3)

Figures are presented here on the place of birth of animals used for the first time in experimental procedures in 2015. Information on the place of birth of re-used animals is not collected.

Species listed in Schedule 2 of the Animal (Scientific Procedures) Act 1986 (see Appendix B, paragraph 15) must be purpose bred, unless the Secretary of State has specifically authorised sourcing from elsewhere (e.g. wild caught birds and small rodents). This is generally only authorised when there is a scientific justification for doing so. There is no requirement for species not listed in Schedule 2 to be purpose bred.

Excluding non-human primates (covered below), of the 2.01 million animals used in experimental procedures for the first time in 2015 (includes species listed and not listed in Schedule 2):

- 97% (1.96 million animals) were born in the UK (1.72 million animals were born at a licensed establishment and 235 thousand animals were not);
- 2% (32 thousand animals) were born in the EU (30 thousand animals were born at a registered breeder and 2,200 animals were not);
- 0.4% (8,500 animals) were born in the rest of Europe;
- 0.7% (13 thousand animals) were born in the rest of the world.

All 2,200 primates used for the first time in experimental procedures in 2015 were purpose bred. Of those 2,200 primates:

- 10% (220 primates) were born in the UK at a licensed establishment (1 primate was born at a registered breeder in the EU);
- 63% (1,400 primates) were born in Africa;
- 27% (600 primates) were born in Asia.

Also, of the 2,200 primates used for the first time in experimental procedures in 2015:

[34] Marine invertebrate animals such as an octopus or squid.

- 73% (1,600 primates) originated from self-sustaining colonies;[35]
- 27% (600 primates) were from a second generation, or greater, primate (i.e. grandparent or earlier generation were wild caught);

Genetic status of animals used in experimental procedures

(See data table 4)

Genetically altered animals are reported separately according to whether they have a harmful phenotype (i.e. a harmful physical or biochemical defect) or not. Many lines of genetically altered animals do not exhibit any harmful phenotype and are visually and behaviourally indistinguishable from wild type animals. Some show a harmful phenotype from birth, e.g. immune deficient mice; others are overtly normal at birth but exhibit a harmful phenotype, such as developing tumours, as they age. Animals are reported as being without a harmful phenotype if used/killed at an age prior to the development of the harmful effect.

In 2015, 28% of experimental procedures (573 thousand) involved genetically altered animals without a harmful phenotype and 7% (147 thousand) involved genetically altered animals with a harmful phenotype.

Prior to 2014, data were collected separately on genetically modified animals and animals with a harmful genetic mutation. Since 2014, data on these are now collected together as genetically altered animals with or without a harmful phenotype. The definitions for genetically altered animals are fully comparable between data prior to and subsequent to the change in 2014.

As Figure 11 shows, in 2015, the number of procedures involving genetically altered animals rose by 11% to 720 thousand procedures from 646 thousand in 2013[36]. This continues the increasing trend from 2006 when 463 thousand procedures involved the use of genetically altered animals. In 2015, the proportion of experimental procedures which used genetically altered animals was 35%.

In contrast, the number of experimental procedures *not* involving genetically altered animals fell by 0.8% between 2013 and 2015 to 1.36 million procedures, continuing the downward trend from 1.65 million procedures in 2008.

[35] As defined in the Animals (Scientific Procedures) Act 1986, a colony of animals is a self sustaining colony if:
(a) the colony is kept in captivity in a way that ensures the animals are accustomed to humans;
(b) the colony consists only of animals that have been bred in captivity; and
(c) the colony is sustained only by animals being bred within the colony or animals being sourced from other colonies that meet paragraphs (a) and (b).

[36] For details regarding the comparison with 2013, see introductory notes, data quality section.

Figure 11: Experimental procedures by genetic status of animal, 2006 to 2015

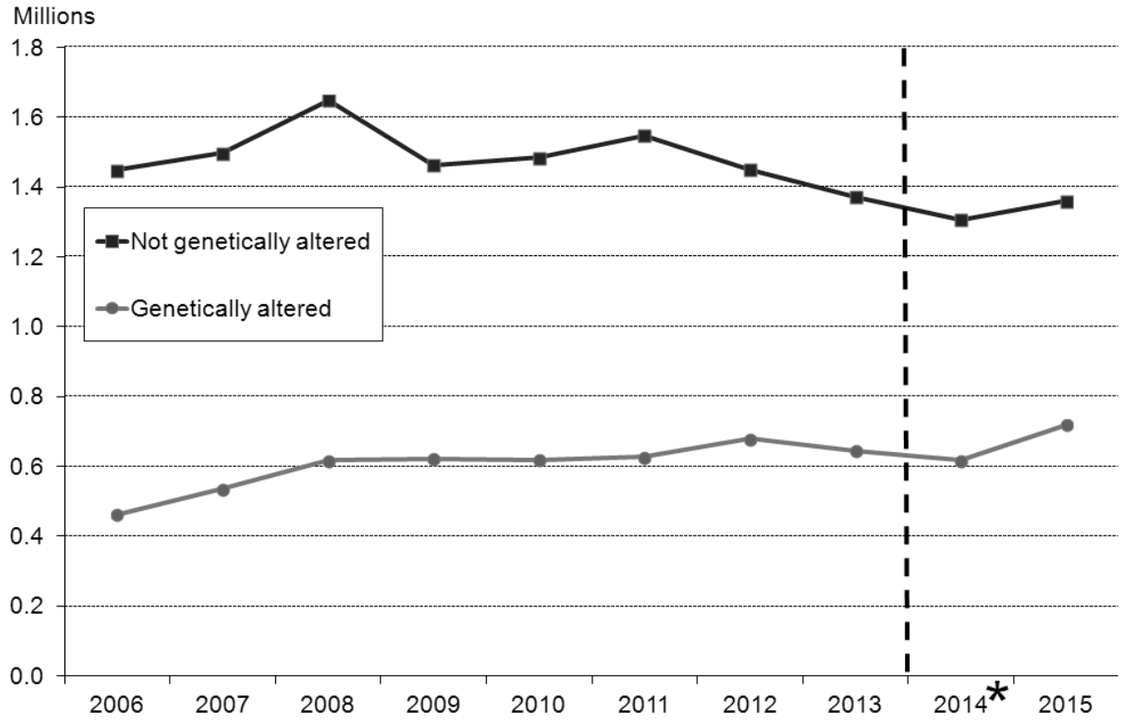


Chart notes:
* The data collection methodology changed in 2014, which resulted in some under-reporting for that year (see introductory notes for more information).

Severity assessments of animals used in experimental procedures

(See data table 3.1)

The 2015 collection is the second year in which information on the actual severity of procedures has been collected (see introductory notes, changes to the data collection section).

Severity assessments by purpose are presented below. As Figure 12 shows, this varies according to the type of procedure, with regulatory purposes tending to have the most severe assessments and basic research tending to have the most sub-threshold assessments.

Figure 12: Severity assessments of experimental procedures by purpose, 2015

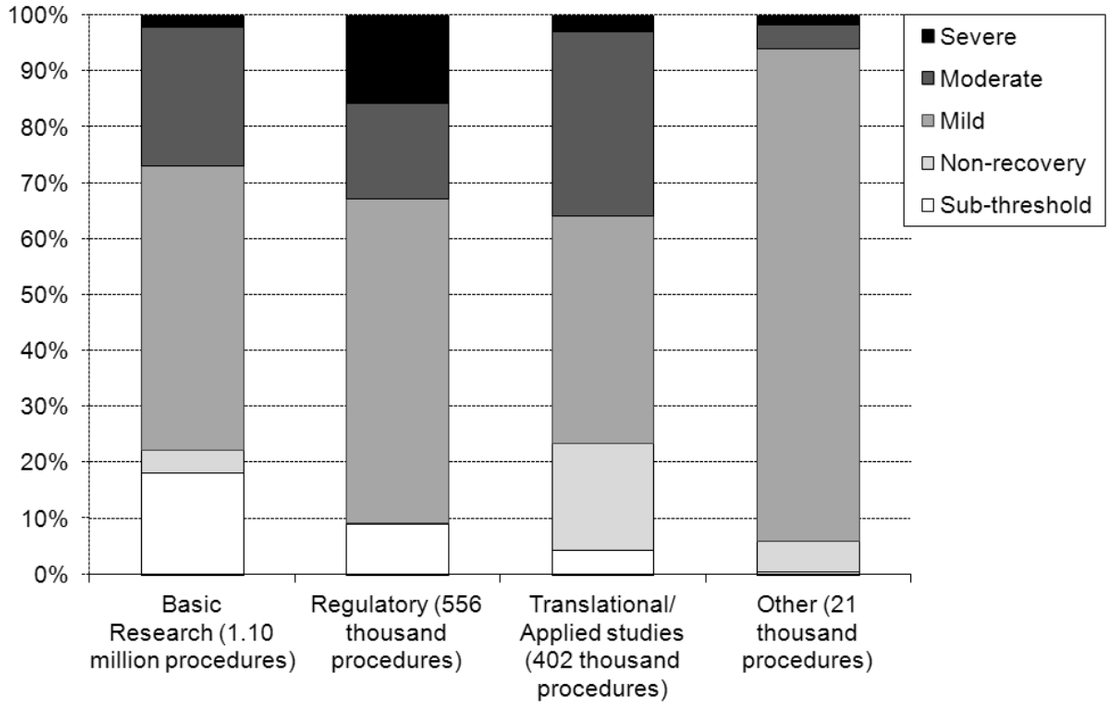


Chart notes:
2015 is the second year in which information on severity assessments has been collected and the severity data should be interpreted with caution (see introductory notes for more information).
Other refers to protection of the environment, higher education or training, preservation of species, and forensic enquiries.

Purpose of experimental procedures

(See data tables 5 to 7.4)

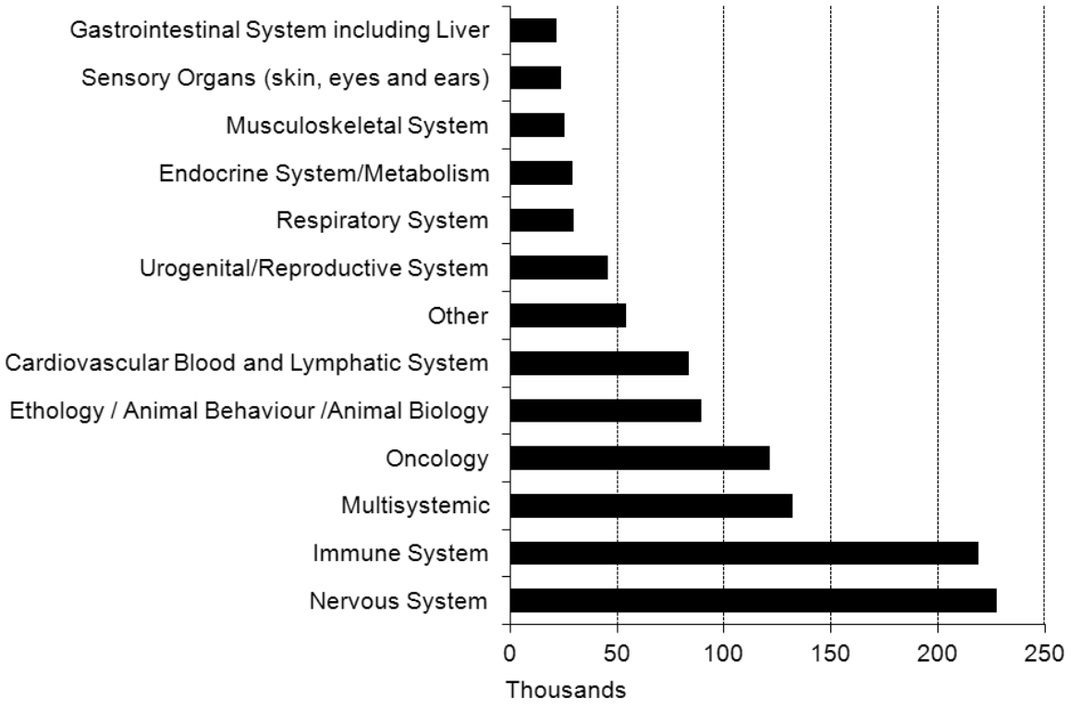
Basic research

(See data table 5)

In 2015, 1.10 million procedures were undertaken for basic research purposes. Of those, 87% (959 thousand procedures) were undertaken for the study of oncology or specified organ systems, 8% (89 thousand) were undertaken for the study of animal biology (including ethology/animal behaviour) and 5% (54 thousand) were undertaken for other purposes. As Figure 13 shows, of the 1.10 million procedures carried out for basic research purposes, the three most common purposes were:

- targeted at the nervous system (21% or 227 thousand procedures);
- targeted at the immune system (20% or 219 thousand procedures);
- multisystemic (12% or 132 thousand procedures).

Figure 13: Procedures undertaken for basic research, by sub-purpose, 2015



Translational/applied research

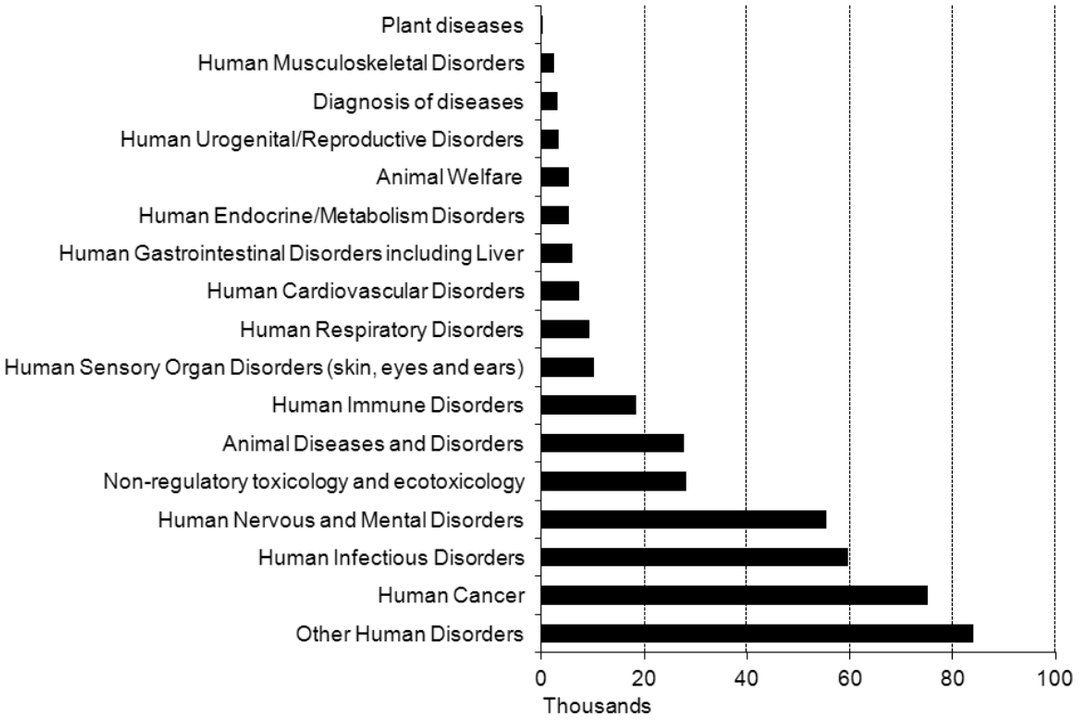
(See data table 6)

In 2015, 402 thousand procedures were undertaken for translational/applied research purposes. Of those, 84% (337 thousand procedures) were undertaken for research on humans, 8% (33 thousand procedures) were undertaken for animal disease and welfare research, 7% (28 thousand procedures) were undertaken for non-regulatory toxicology/ecotoxicology, and 0.8% (3,100) were undertaken for the diagnosis of diseases. As Figure 14 shows, of the 402 thousand procedures undertaken for translational and applied research, the three most common specific research purposes were:

- human cancer (19% or 75 thousand procedures);
- human infectious disorders (15% or 60 thousand procedures);
- human nervous and mental disorders (14% or 55 thousand procedures).

However, the most common translational/applied research purpose was ‘other human disorders’, which included procedures where the focus of the outcome was specifically intended to be multi-systemic or equally likely to impact more than one body system.

Figure 14: Procedures undertaken for translational/applied research, by sub-purpose, 2015



Regulatory use

(See data tables 7.1 to 7.4)

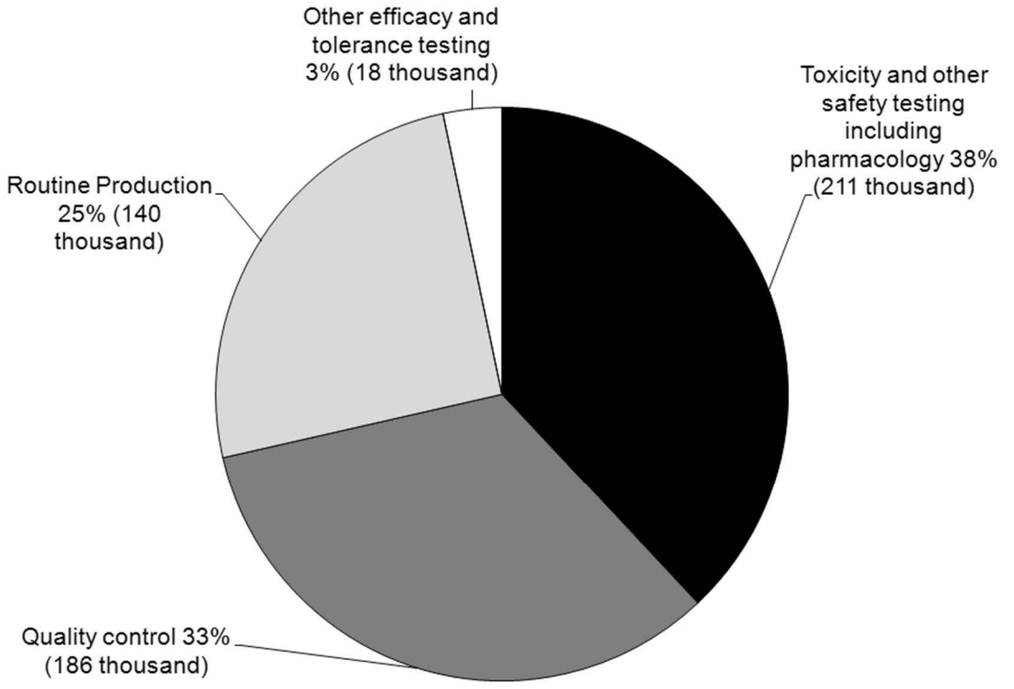
This category includes all procedures carried out to satisfy legal requirements including the production of substances to legal specification, such as material for diagnostic tests (e.g. blood products), studies to evaluate the safety or effectiveness of pharmaceuticals, and studies to evaluate the safety of other chemicals.

In 2015, 556 thousand procedures were undertaken for regulatory use. Of those, as Figure 15 shows:

- 38% (211 thousand) were for toxicity and other safety testing including pharmacology, of which:
  - other types of regulatory tests or procedures accounted for 179 thousand procedures (32% of all procedures undertaken for regulatory use);
  - acute and sub-acute toxicity testing methods accounted for 16 thousand procedures (3% of all procedures undertaken for regulatory use);
  - ecotoxicity[37] accounted for 12 thousand procedures (2% of all procedures undertaken for regulatory use).
- 33% (186 thousand) were for the quality control of marketed medicines.
- 25% (140 thousand) were for routine production, e.g. for vaccines and diagnostic reagents.

[37] Ecotoxicity studies in animals relate to toxicity studies that are legislatively required to demonstrate the environmental safety of a substance.

Figure 15: Regulatory use procedures by type, 2015

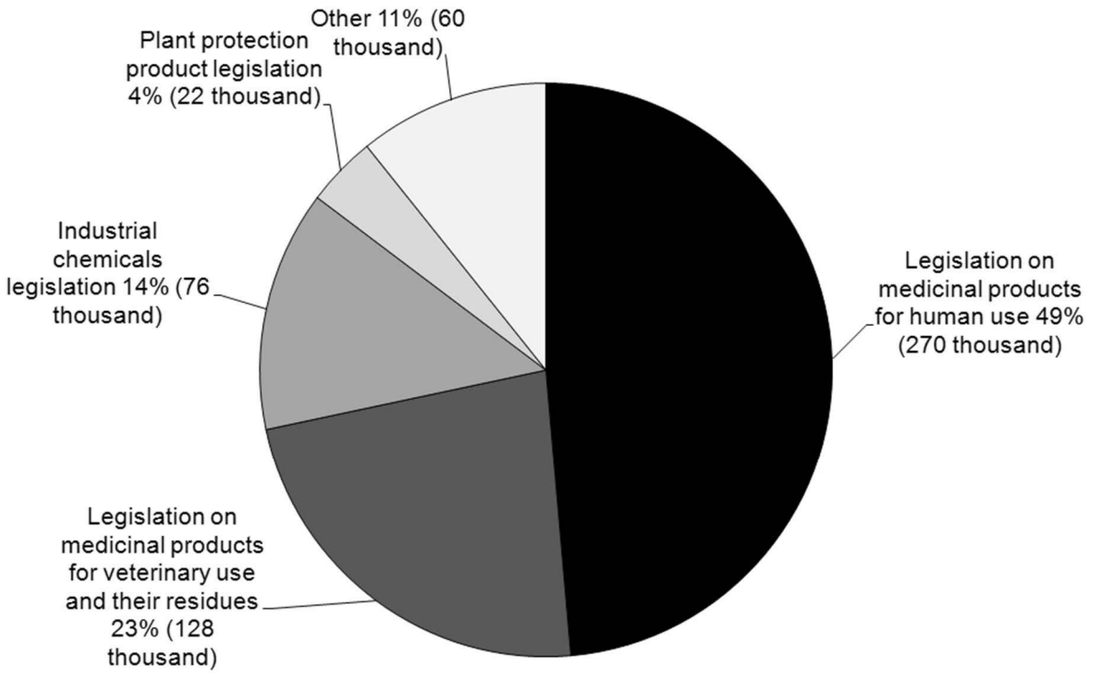


Legislative requirements
(See data table 7.2)

In 2015, of the 556 thousand procedures undertaken for regulatory use, as Figure 16 shows:

- 49% (270 thousand) involved legislation on medicinal products for human use;
- 23% (128 thousand) involved legislation on medicinal products for veterinary use (and their residues);
- 14% (76 thousand) involved industrial chemicals legislation;
- 4% (22 thousand) involved plant protection product legislation.

Figure 16: Regulatory procedures by legislation, 2015



Origin of legislative requirement
(See data table 7.3)

In 2015, of the 556 thousand procedures undertaken for regulatory testing:

- 97% (537 thousand) satisfied both UK and EU legislative requirements;
- 3% (19 thousand) satisfied non-EU legislative requirements;
- 0.03% (160) satisfied only UK legislative requirements.

Creation/breeding of genetically altered animals

(See data tables 1 and 8 to 10)

The creation/breeding of genetically altered animals includes the use of animals for the creation of new lines of genetically altered animals and the breeding of established lines of genetically altered animals that were not used in further regulated procedures. This category also includes some animals that were bred with the intention of producing genetically altered animals, but resulted in non-genetically altered animals being born (7% of animals in this category or 134 thousand animals in 2015). In addition, some animals used for the creation of a new genetic line will also have been genetically normal animals (e.g. those used for superovulation). Almost all of the animals (99%) used in these procedures were born at a licensed establishment in the UK.

In 2015, a total of 2.06 million genetically altered animals were created/bred but not used in further procedures, accounting for 50% of the total procedures in 2015. Of the 2.06 million genetically altered animals created/bred, nearly all involved mice (86% or 1.77 million procedures), zebrafish (13% or 268 thousand procedures), rats (0.5% or 11 thousand procedures, and Xenopus (0.4% or 9,200 procedures).

Creation of new lines of genetically altered animals

(See data tables 9.1 to 9.3)

Of the 2.06 million genetically altered animals created/bred but not used in further procedures in 2015, 15% (303 thousand) were for the creation of new lines of genetically altered animals. This category includes the initial stages of the creation of a novel transgenic[38] or mutant[39] line of animal until that line becomes established. Of the 303 thousand animals used in 2015 to create new lines of genetically altered animals:

- 97% (295 thousand) were for basic research purposes – of those, 22% (64 thousand) were genetically altered and had a harmful phenotype;
- 3% (8,400) were for translational/applied studies.

Maintenance of established lines of genetically altered animals

(See data table 10)

Of the 2.06 million genetically altered animals created/bred but not used in further procedures in 2015, 1.76 million (85%) were for the maintenance of established lines of genetically altered animals. These are lines of genetically altered animals that are stably transmitted (i.e. where the genetic trait is transmitted to offspring in the expected proportion and with the expected severity) and have been bred for at least two generations. Of the 1.76 million animals bred in 2015 for the maintenance of established lines of genetically altered animals:

- 71% (1.26 million) were genetically altered but did not have a harmful phenotype;
- 24% (426 thousand) were genetically altered and did have a harmful phenotype;
- 4% (77 thousand) were not genetically altered and were, for example, wild type offspring of heterozygous parents.

Techniques of specific interest

Information on specific techniques, where the Home Office has policies related to these areas, was also collected in 2015:

- 75 procedures for regulatory use (industrial chemicals and plant protection legislation) involved the testing of three household product ingredients;
- no animals were used for the production of monoclonal antibodies from ascitic fluid, the testing of tobacco products, the testing of cosmetics or for alcohol research.

Use of neuromuscular blocking agents and anaesthesia

The use of neuromuscular blocking agents (NMBA)[40] was recorded in 19 returns (out of 3,173). Of those, 18 returns indicated using anaesthesia[41] and one return did not. The nature of the experiments conducted using NMBA without anaesthesia meant that, at the time, the animals were not expected to experience pain.

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[38] A transgenic animal or strain is one containing novel genes that have been inserted by laboratory manipulation.
[39] A mutant animal or strain is one where the genes of the animal have either naturally mutated or have been induced to change by the application of a chemical or other mutation-inducing substance.
[40] Neuromuscular blocking agents relax skeletal muscles and induce paralysis.
[41] Local or general anaesthesia, with the latter rendering an animal unconscious.

Rodenticide trials

It is impracticable to collect accurate figures on the number of animals used in field trials of rodenticide[42] substances. However, two returns indicated that such field trials occurred in 2015.

Use of animals of endangered species

Returns were required on the use of animals listed in Annex A of European Council Regulation (EC) No 338/97 and not within the scope of Article 7(1) of that Regulation. One return (out of 3,173) indicated using animals in this category in 2015, specifically wild birds in research relevant to those species.

International comparisons

Northern Ireland collects figures on the same basis as Great Britain. These are published separately by the Department of Health, Northern Ireland.[43]

Previously, data compiled by EU countries and submitted to the European Commission used a narrower, but common, definition of animal experiments. The main differences between the EU's and the UK's figures were that the EU's figures were based on the numbers of animals used, not on the numbers of procedures, and excluded the creation/breeding of genetically altered animals. However, for data relating to 2014 onwards, following the new European Directive (see introductory notes, changes to the data collection section) other EU countries have now begun including the creation/breeding of some genetically animals in their figures.

The latest EU-wide data,[44] based on the previous narrower definition, are for 2011 and some of the key points are as followed:

- The total number of animals used for experimental and other scientific purposes in 2011 (with one Member State reporting for 2010) was 11.48 million, which represents a reduction of over half a million animals used in the EU from the number reported in 2008.
- Rodents and rabbits represent 80% of the total number of animals used in the EU; mice are the most commonly used animal species, accounting for 61% of the total use, followed by rats at 14%.
- No great apes have been used in the EU since 1999; furthermore, there has been a substantial decrease in the use of non-human primates.

[42] Rodenticides are a category of pest control chemicals intended to kill rodents. Rodenticide trials are field trials of such chemicals and are occasionally undertaken by commercial companies that produce them to assess safety and efficacy aspects of their use.

[43] See: https://www.health-ni.gov.uk/publications/statistics-scientific-procedures-living-animals-northern-ireland.

[44] Seventh 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(2013)859/final, available at:
http://ec.europa.eu/environment/chemicals/lab_animals/reports_en.htm.

Returns, project licences, establishment licences, and personal licences

(See data table 11)

Statistical returns are required each year for every project licence in force for part or all of the year. For data relating to 2015, returns were provided under 3,173 project licences, 100% of those in force for part or all of the year. Of the 3,173 project licences:

- procedures were completed under 2,488 project licences (2,477 covered countable procedures and 11 covered only non-countable procedures);
- no procedures were completed under 685 project licences.

There were 2,656 project licences in force at the end of 2015 compared with 2,610 at the end of 2014. There were 173 establishment licences in force authorising places where work was carried out at the end of 2015, the same number as at the end of 2014.

The Home Office is in the process of moving from a paper-based to an electronic licensing system. As a result, it has not been possible to identify the exact number of personal licences in force at the end of December 2015. It is expected in 2016 that it will possible to identify the number of personal licences held once the conversion to the electronic licensing system is completed. Nonetheless, at the end of December 2013, there were 16,112 active personal licences in force.

Tables

Organisation chart

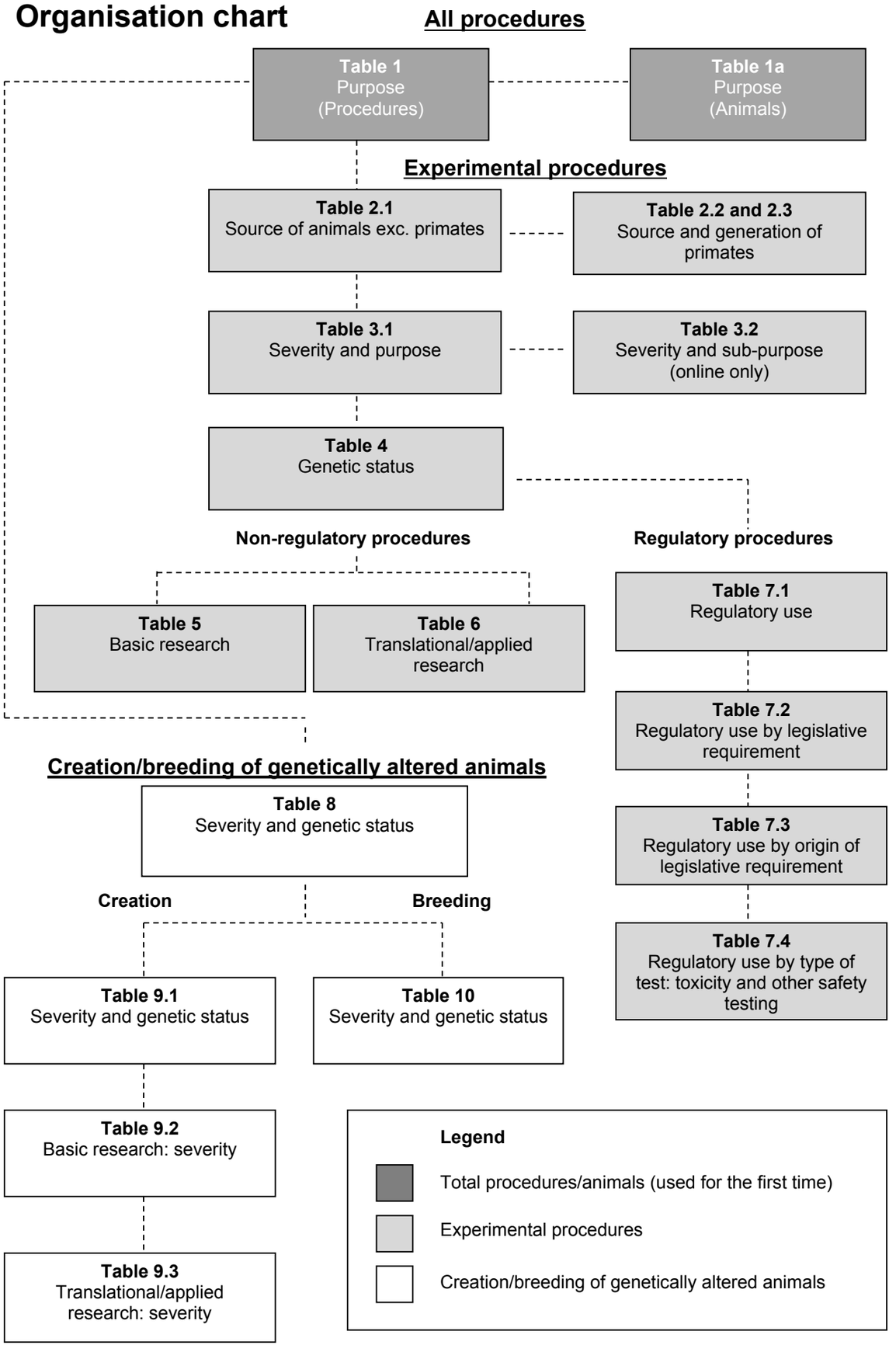

Table 1 Number of procedures by species of animal and purpose of the procedure

Great Britain 2015

Species of animal	Experimental purpose of procedure (excluding creation & breeding)								Creation & breeding of GA animals not used in experimental procedures	Total procedures	% of total procedures
	Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries	Regulatory	**Total experimental procedures**			
Mammal											
Mouse *(Mus musculus)*	811,079	245,990	958	0	851	0	205,623	1,264,501	1,773,666	**3,038,167**	**73.3**
Rat *(Rattus norvegicus)*	56,451	55,315	515	0	861	0	144,523	257,665	10,857	**268,522**	**6.5**
Guinea-pig *(Cavia porcellus)*	1,232	15,095	0	0	105	0	5,399	21,831	0	**21,831**	**0.5**
Hamster (Syrian) (*Mesocricetus auratus*)	366	278	0	0	0	0	856	1,500	0	**1,500**	**0.0**
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Mongolian Gerbil *(Meriones unguiculatus)*	250	28	0	0	0	0	0	278	0	**278**	**0.0**
Other rodent *(other Rodentia)*	1,506	0	124	21	0	0	112	1,763	0	**1,763**	**0.0**
Rabbit *(Oryctolagus cuniculus)*	1,368	1,863	0	0	2	0	10,922	14,155	0	**14,155**	**0.3**
Cat *(Felis catus)*	188	21	0	0	0	0	0	209	0	**209**	**0.0**
Beagle *(Canis lupus familiaris)*	49	786	0	0	0	0	3,511	4,346	0	**4,346**	**0.1**
Other dog (Other Canis)	281	16	0	0	0	0	0	297	0	**297**	**0.0**
Ferret *(Mustela putorius furo)*	126	486	0	0	14	0	0	626	0	**626**	**0.0**
Other carnivore *(other Carnivora)*	130	212	123	31	0	0	0	496	0	**496**	**0.0**
Horse and other equid *(Equidae)*	541	102	0	0	0	0	7,713	8,356	0	**8,356**	**0.2**
Pig *(Sus scrofa domesticus)*	939	1,684	0	0	8	0	2,895	5,526	301	**5,827**	**0.1**
Goat *(Capra aegagrus hircus)*	37	37	0	0	0	0	31	105	0	**105**	**0.0**
Sheep *(Ovis aries)*	4,088	3,559	26	0	0	0	38,882	46,555	31	**46,586**	**1.1**
Cattle *(Bos primigenius)*	824	722	141	0	0	0	1,474	3,161	0	**3,161**	**0.1**
Primate											
New World monkey											
Marmoset and tamarin	102	29	0	0	0	0	0	131	0	**131**	**0.0**
Old World monkey											
Cynomolgus monkey (*Macaca fascicularis*)	14	179	0	0	0	0	3,140	3,333	0	**3,333**	**0.1**
Rhesus monkey (*Macaca mulatta*)	108	37	0	0	0	0	3	148	0	**148**	**0.0**
Other mammal *(other Mammalia)*	294	0	77	0	0	0	4	375	4	**379**	**0.0**
Bird											
Domestic fowl (*Gallus domesticus*)	7,417	6,558	0	0	0	0	112,688	126,663	701	**127,364**	**3.1**
Quail *(Coturnix coturnix)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other bird *(other Aves)*	9,847	1,639	1,000	169	0	0	1,406	14,061	0	**14,061**	**0.3**
Reptile *(Reptilia)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Amphibian											
Rana *(temporaria and pipiens)*	378	0	0	0	0	0	0	378	0	**378**	**0.0**
Xenopus *(laevis and tropicalis)*	8,130	0	0	0	0	0	0	8,130	9,233	**17,363**	**0.4**
Other amphibian *(other Amphibia)*	1,825	0	0	0	0	0	0	1,825	0	**1,825**	**0.0**
Fish											
Zebrafish *(Danio rerio)*	97,200	47,013	3,038	0	4	0	505	147,760	267,385	**415,145**	**10.0**
Other fish *(other Pisces)*	97,326	20,162	11,739	536	0	0	16,033	145,796	483	**146,279**	**3.5**
Cephalopod *(Cephalopoda)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Total	**1,102,096**	**401,811**	**17,741**	**757**	**1,845**	**0**	**555,720**	**2,079,970**	**2,062,661**	**4,142,631**	**100.0**
% of total	**26.6**	**9.7**	**0.4**	**0.0**	**0.0**	**0.0**	**13.4**	**50.2**	**49.8**	**100.0**	

Table 1a Number of animals used for the first time in procedures by species of animal and purpose of the procedure

Great Britain 2015

Species of animal	Experimental purpose of procedure (excluding creation & breeding)								Creation & breeding of GA animals not used in experimental procedures	Total animals used for the first time in procedures	% of total animals used for the first time in procedures
	Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries	Regulatory	Total animals used for the first time in experimental procedures			
Mammal											
Mouse *(Mus musculus)*	808,595	245,442	958	0	763	0	205,583	1,261,341	1,773,508	**3,034,849**	**74.6**
Rat *(Rattus norvegicus)*	54,625	54,579	515	0	861	0	144,301	254,881	10,857	**265,738**	**6.5**
Guinea-pig *(Cavia porcellus)*	1,232	15,095	0	0	105	0	5,399	21,831	0	**21,831**	**0.5**
Hamster (Syrian) (*Mesocricetus auratus*)	366	278	0	0	0	0	856	1,500	0	**1,500**	**0.0**
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Mongolian Gerbil *(Meriones unguiculatus)*	221	28	0	0	0	0	0	249	0	**249**	**0.0**
Other rodent *(other Rodentia)*	1,506	0	124	21	0	0	112	1,763	0	**1,763**	**0.0**
Rabbit *(Oryctolagus cuniculus)*	1,198	1,833	0	0	2	0	9,239	12,272	0	**12,272**	**0.3**
Cat *(Felis catus)*	171	21	0	0	0	0	0	192	0	**192**	**0.0**
Beagle *(Canis lupus familiaris)*	30	126	0	0	0	0	3,085	3,241	0	**3,241**	**0.1**
Other dog (Other Canis)	148	16	0	0	0	0	0	164	0	**164**	**0.0**
Ferret *(Mustela putorius furo)*	126	486	0	0	14	0	0	626	0	**626**	**0.0**
Other carnivore *(other Carnivora)*	130	212	123	31	0	0	0	496	0	**496**	**0.0**
Horse and other equid *(Equidae)*	499	16	0	0	0	0	66	581	0	**581**	**0.0**
Pig *(Sus scrofa domesticus)*	933	1,506	0	0	8	0	2,880	5,327	296	**5,623**	**0.1**
Goat *(Capra aegagrus hircus)*	37	37	0	0	0	0	31	105	0	**105**	**0.0**
Sheep *(Ovis aries)*	3,743	3,370	26	0	0	0	435	7,574	31	**7,605**	**0.2**
Cattle *(Bos primigenius)*	712	682	141	0	0	0	1,389	2,924	0	**2,924**	**0.1**
Primate											
New World monkey											
Marmoset and tamarin	90	25	0	0	0	0	0	115	0	**115**	**0.0**
Old World monkey											
Cynomolgus monkey (*Macaca fascicularis*)	0	78	0	0	0	0	1,961	2,039	0	**2,039**	**0.1**
Rhesus monkey (*Macaca mulatta*)	40	37	0	0	0	0	3	80	0	**80**	**0.0**
Other mammal *(other Mammalia)*	290	0	77	0	0	0	4	371	4	**375**	**0.0**
Bird											
Domestic fowl (*Gallus domesticus*)	7,417	6,485	0	0	0	0	112,688	126,590	701	**127,291**	**3.1**
Quail *(Coturnix coturnix)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other bird *(other Aves)*	9,734	1,379	1,000	169	0	0	1,384	13,666	0	**13,666**	**0.3**
Reptile *(Reptilia)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Amphibian											
Rana *(temporaria and pipiens)*	378	0	0	0	0	0	0	378	0	**378**	**0.0**
Xenopus *(laevis and tropicalis)*	2,521	0	0	0	0	0	0	2,521	9,040	**11,561**	**0.3**
Other amphibian *(other Amphibia)*	1,823	0	0	0	0	0	0	1,823	0	**1,823**	**0.0**
Fish											
Zebrafish *(Danio rerio)*	95,956	47,013	3,038	0	4	0	505	146,516	259,571	**406,087**	**10.0**
Other fish *(other Pisces)*	97,222	20,162	11,739	536	0	0	16,033	145,692	483	**146,175**	**3.6**
Cephalopod *(Cephalopoda)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Total	**1,089,743**	**398,906**	**17,741**	**757**	**1,757**	**0**	**505,954**	**2,014,858**	**2,054,491**	**4,069,349**	**100.0**
% of total	**26.8**	**9.8**	**0.4**	**0.0**	**0.0**	**0.0**	**12.4**	**49.5**	**50.5**	**100.0**	

Table 2.1 Place of birth of animals used for the first time in experimental procedures by species of animal (excludes non-human primates)

Great Britain 2015

Species of animal	Place of birth						Total	% of total
	Animals born in the UK at a licensed establishment	Animals born in the UK but **not** at a licensed establishment	Animals born elsewhere in the EU at a registered breeder	Animals born elsewhere in the EU but **not** at a registered breeder	Animals born in rest of Europe	Animals born in rest of world		
Mammal								
Mouse *(Mus musculus)**	1,235,690	119	19,146	0	12	6,374	**1,261,341**	**62.7**
Rat *(Rattus norvegicus)**	247,053	199	6,732	0	0	897	**254,881**	**12.7**
Guinea-pig *(Cavia porcellus)**	21,824	0	7	0	0	0	**21,831**	**1.1**
Hamster (Syrian) (*Mesocricetus auratus*)*	414	0	605	0	7	474	**1,500**	**0.1**
Hamster (chinese) (*Cricetulus griseus*)*	0	0	0	0	0	0	**0**	**0.0**
Mongolian Gerbil *(Meriones unguiculatus)**	221	0	28	0	0	0	**249**	**0.0**
Other rodent *(other Rodentia)*	389	1,371	0	0	0	3	**1,763**	**0.1**
Rabbit *(Oryctolagus cuniculus)**	9,610	0	917	0	0	1,745	**12,272**	**0.6**
Cat *(Felis catus)**	0	139	53	0	0	0	**192**	**0.0**
Beagle *(Canis lupus familiaris)**	1,976	0	253	0	0	1,012	**3,241**	**0.2**
Other dog (Other Canis)*	8	156	0	0	0	0	**164**	**0.0**
Ferret *(Mustela putorius furo)**	603	0	0	0	0	23	**626**	**0.0**
Other carnivore *(other Carnivora)*	0	496	0	0	0	0	**496**	**0.0**
Horse and other equid *(Equidae)*	67	514	0	0	0	0	**581**	**0.0**
Pig *(Sus scrofa domesticus)**	1,559	3,238	431	99	0	0	**5,327**	**0.3**
Goat *(Capra aegagrus hircus)*	0	105	0	0	0	0	**105**	**0.0**
Sheep *(Ovis aries)**	1,310	6,263	1	0	0	0	**7,574**	**0.4**
Cattle *(Bos primigenius)*	409	2,325	20	170	0	0	**2,924**	**0.1**
Other mammal *(other Mammalia)*	17	354	0	0	0	0	**371**	**0.0**
Bird								
Domestic fowl (*Gallus domesticus*)	13,395	112,287	448	460	0	0	**126,590**	**6.3**
Quail *(Coturnix coturnix)*	0	0	0	0	0	0	**0**	**0.0**
Other bird *(other Aves)*	6,018	7,316	0	261	0	71	**13,666**	**0.7**
Reptile *(Reptilia)*	0	0	0	0	0	0	**0**	**0.0**
Amphibian								
Rana *(temporaria and pipiens)**	0	378	0	0	0	0	**378**	**0.0**
Xenopus *(laevis and tropicalis)**	1,666	0	48	0	0	807	**2,521**	**0.1**
Other amphibian *(other Amphibia)*	0	1,518	0	0	0	305	**1,823**	**0.1**
Fish								
Zebrafish *(Danio rerio)**	144,793	0	604	0	0	1,119	**146,516**	**7.3**
Other fish *(other Pisces)*	36,881	98,273	293	1,231	8,504	510	**145,692**	**7.2**
Cephalopod *(Cephalopoda)*	0	0	0	0	0	0	**0**	**0.0**
Total	**1,723,903**	**235,051**	**29,586**	**2,221**	**8,523**	**13,340**	**2,012,624**	**100.0**
% of total	**85.7**	**11.7**	**1.5**	**0.1**	**0.4**	**0.7**	**100.0**	

* Denotes species listed in Schedule 2; Pigs and Sheep are only listed in Schedule 2 if they are genetically altered.

Table 2.2 Place of birth of non-human primates[1] used for the first time in experimental procedures by species of primate

Great Britain 2015

Species of primate	Place of birth							Total	% of total
	Animals born in the UK at a licensed establishment	Animals born at a registered breeder elsewhere within EU	Animals born in rest of Europe	Animals born in Asia	Animals born in America	Animals born in Africa	Animals born elsewhere		
Primate									
New World monkey									
Marmoset and tamarin	114	1	0	0	0	0	0	**115**	**5.1**
Old World monkey									
Cynomolgus monkey (*Macaca fascicularis*)	29	0	0	593	0	1,417	0	**2,039**	**91.3**
Rhesus monkey (*Macaca mulatta*)	77	0	0	3	0	0	0	**80**	**3.6**
Total	**220**	**1**	**0**	**596**	**0**	**1,417**	**0**	**2,234**	**100.0**
% of total	**9.8**	**0.0**	**0.0**	**26.7**	**0.0**	**63.4**	**0.0**	**100.0**	

1. All primate species are listed in Schedule 2 of the Animals (Scientific Procedures) Act 1986.

Table 2.3 Generation of non-human primates used for the first time in experimental procedures by species of primate

Great Britain 2015

Species of primate	Generation				Total	% of total
	F0	F1	F2 or greater	Self-sustaining colony		
Primate						
New World monkey						
Marmoset and tamarin	0	0	0	115	**115**	**5.1**
Old World monkey						
Cynomolgus monkey (*Macaca fascicularis*)	0	0	593	1,446	**2,039**	**91.3**
Rhesus monkey (*Macaca mulatta*)	0	0	5	75	**80**	**3.6**
Total	**0**	**0**	**598**	**1,636**	**2,234**	**100.0**
% of total	**0.0**	**0.0**	**26.8**	**73.2**	**100.0**	

Table 3.1 Experimental procedures by species of animal, severity and purpose of the procedure[1], page 1 of 2

Great Britain 2015

Species of animal	Actual Severity	Experimental purpose of procedure							Total	% of total
		Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries	Regulatory		
Mouse	Sub threshold	168,893	15,897	8	0	0	0	170	184,968	14.6
	Non - recovery	31,882	50,272	0	0	153	0	224	82,531	6.5
	Mild	358,223	87,329	719	0	698	0	57,534	504,503	39.9
	Moderate	236,879	86,964	0	0	0	0	67,162	391,005	30.9
	Severe	15,202	5,528	231	0	0	0	80,533	101,494	8.0
	Total	**811,079**	**245,990**	**958**	**0**	**851**	**0**	**205,623**	**1,264,501**	**100.0**
Rat	Sub threshold	2,763	202	4	0	0	0	45,470	48,439	18.8
	Non - recovery	10,673	11,275	0	0	706	0	666	23,320	9.1
	Mild	18,400	22,440	402	0	128	0	80,894	122,264	47.5
	Moderate	23,105	21,054	13	0	27	0	16,085	60,284	23.4
	Severe	1,510	344	96	0	0	0	1,408	3,358	1.3
	Total	**56,451**	**55,315**	**515**	**0**	**861**	**0**	**144,523**	**257,665**	**100.0**
Guinea pig	Sub threshold	51	0	0	0	0	0	0	51	0.2
	Non - recovery	307	13,466	0	0	85	0	0	13,858	63.5
	Mild	369	1,226	0	0	20	0	2,022	3,637	16.7
	Moderate	502	272	0	0	0	0	1,507	2,281	10.4
	Severe	3	131	0	0	0	0	1,870	2,004	9.2
	Total	**1,232**	**15,095**	**0**	**0**	**105**	**0**	**5,399**	**21,831**	**100.0**
Other rodent	Sub threshold	0	0	0	0	0	0	3	3	0.1
	Non - recovery	37	1	0	0	0	0	0	38	1.1
	Mild	1,537	259	124	21	0	0	807	2,748	77.6
	Moderate	487	3	0	0	0	0	157	647	18.3
	Severe	61	43	0	0	0	0	1	105	3.0
	Total	**2,122**	**306**	**124**	**21**	**0**	**0**	**968**	**3,541**	**100.0**
Rabbit	Sub threshold	10	1	0	0	0	0	0	11	0.1
	Non - recovery	335	915	0	0	2	0	121	1,373	9.7
	Mild	827	442	0	0	0	0	9,609	10,878	76.8
	Moderate	192	356	0	0	0	0	1,165	1,713	12.1
	Severe	4	149	0	0	0	0	27	180	1.3
	Total	**1,368**	**1,863**	**0**	**0**	**2**	**0**	**10,922**	**14,155**	**100.0**
Cat	Sub threshold	8	0	0	0	0	0	0	8	3.8
	Non - recovery	0	0	0	0	0	0	0	0	0.0
	Mild	179	6	0	0	0	0	0	185	88.5
	Moderate	1	15	0	0	0	0	0	16	7.7
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**188**	**21**	**0**	**0**	**0**	**0**	**0**	**209**	**100.0**
Dog	Sub threshold	14	0	0	0	0	0	0	14	0.3
	Non - recovery	0	29	0	0	0	0	20	49	1.1
	Mild	316	701	0	0	0	0	2,080	3,097	66.7
	Moderate	0	72	0	0	0	0	1,408	1,480	31.9
	Severe	0	0	0	0	0	0	3	3	0.1
	Total	**330**	**802**	**0**	**0**	**0**	**0**	**3,511**	**4,643**	**100.0**
Ferret	Sub threshold	0	0	0	0	0	0	0	0	0.0
	Non - recovery	12	0	0	0	14	0	0	26	4.2
	Mild	23	462	0	0	0	0	0	485	77.5
	Moderate	91	23	0	0	0	0	0	114	18.2
	Severe	0	1	0	0	0	0	0	1	0.2
	Total	**126**	**486**	**0**	**0**	**14**	**0**	**0**	**626**	**100.0**
Horse	Sub threshold	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0.0
	Mild	531	101	0	0	0	0	7,700	8,332	99.7
	Moderate	10	1	0	0	0	0	13	24	0.3
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**541**	**102**	**0**	**0**	**0**	**0**	**7,713**	**8,356**	**100.0**
Pig	Sub threshold	122	23	0	0	0	0	24	169	3.1
	Non - recovery	151	337	0	0	8	0	0	496	9.0
	Mild	385	1,228	0	0	0	0	2,404	4,017	72.7
	Moderate	273	93	0	0	0	0	453	819	14.8
	Severe	8	3	0	0	0	0	14	25	0.5
	Total	**939**	**1,684**	**0**	**0**	**8**	**0**	**2,895**	**5,526**	**100.0**
All other ungulate	Sub threshold	73	0	48	0	0	0	50	171	0.3
	Non - recovery	29	40	0	0	0	0	0	69	0.1
	Mild	4,256	3,832	117	0	0	0	40,106	48,311	97.0
	Moderate	584	436	2	0	0	0	219	1,241	2.5
	Severe	7	10	0	0	0	0	12	29	0.1
	Total	**4,949**	**4,318**	**167**	**0**	**0**	**0**	**40,387**	**49,821**	**100.0**
Other mammal	Sub threshold	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0.0
	Mild	354	174	200	31	0	0	4	763	87.6
	Moderate	58	38	0	0	0	0	0	96	11.0
	Severe	12	0	0	0	0	0	0	12	1.4
	Total	**424**	**212**	**200**	**31**	**0**	**0**	**4**	**871**	**100.0**

1. No procedures were completed in 2015 on reptiles and cephalopods. Therefore, these species are not listed in this table.

Table 3.1 Experimental procedures by species of animal, severity and purpose of the procedure[1], page 2 of 2

Great Britain 2015

Species of animal	Severity	Experimental purpose of procedure								% of total
		Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries	Regulatory	**Total**	
Primate	Sub threshold	0	0	0	0	0	0	0	0	0.0
	Non - recovery	18	1	0	0	0	0	10	29	0.8
	Mild	95	175	0	0	0	0	2,354	2,624	72.6
	Moderate	93	62	0	0	0	0	776	931	25.8
	Severe	18	7	0	0	0	0	3	28	0.8
	Total	**224**	**245**	**0**	**0**	**0**	**0**	**3,143**	**3,612**	**100.0**
Bird	Sub threshold	4,655	781	0	0	0	0	825	6,261	4.4
	Non - recovery	18	192	0	0	0	0	0	210	0.1
	Mild	10,428	5,546	1,000	169	0	0	110,101	127,244	90.4
	Moderate	2,063	1,151	0	0	0	0	2,329	5,543	3.9
	Severe	100	527	0	0	0	0	839	1,466	1.0
	Total	**17,264**	**8,197**	**1,000**	**169**	**0**	**0**	**114,094**	**140,724**	**100.0**
Amphibian	Sub threshold	110	0	0	0	0	0	0	110	1.1
	Non - recovery	69	0	0	0	0	0	0	69	0.7
	Mild	7,861	0	0	0	0	0	0	7,861	76.1
	Moderate	430	0	0	0	0	0	0	430	4.2
	Severe	1,863	0	0	0	0	0	0	1,863	18.0
	Total	**10,333**	**0**	**0**	**0**	**0**	**0**	**0**	**10,333**	**100.0**
Fish	Sub threshold	24,101	682	28	0	0	0	3,439	28,250	9.6
	Non - recovery	998	9	0	0	4	0	0	1,011	0.3
	Mild	155,758	39,382	13,906	536	0	0	7,054	216,636	73.8
	Moderate	9,255	22,198	826	0	0	0	2,717	34,996	11.9
	Severe	4,414	4,904	17	0	0	0	3,328	12,663	4.3
	Total	**194,526**	**67,175**	**14,777**	**536**	**4**	**0**	**16,538**	**293,556**	**100.0**
All species	Sub threshold	200,800	17,586	88	0	0	0	49,981	268,455	12.9
	Non - recovery	44,529	76,537	0	0	972	0	1,041	123,079	5.9
	Mild	559,542	163,303	16,468	757	846	0	322,669	1,063,585	51.1
	Moderate	274,023	132,738	841	0	27	0	93,991	501,620	24.1
	Severe	23,202	11,647	344	0	0	0	88,038	123,231	5.9
	Total	**1,102,096**	**401,811**	**17,741**	**757**	**1,845**	**0**	**555,720**	**2,079,970**	**100.0**

1. No procedures were completed in 2015 on reptiles and cephalopods. Therefore, these species are not listed in this table.

Table 4 Experimental procedures by species of animal and genetic status

Great Britain 2015

Species of animal	Genetic status			Total	% of total
	Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Mammal					
Mouse *(Mus musculus)*	650,019	475,897	138,585	**1,264,501**	**60.8**
Rat *(Rattus norvegicus)*	251,329	4,081	2,255	**257,665**	**12.4**
Guinea-pig *(Cavia porcellus)*	21,831	0	0	**21,831**	**1.0**
Hamster (Syrian) (*Mesocricetus auratus*)	1,500	0	0	**1,500**	**0.1**
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	**0**	**0.0**
Mongolian Gerbil *(Meriones unguiculatus)*	278	0	0	**278**	**0.0**
Other rodent *(other Rodentia)*	1,763	0	0	**1,763**	**0.1**
Rabbit *(Oryctolagus cuniculus)*	14,155	0	0	**14,155**	**0.7**
Cat *(Felis catus)*	209	0	0	**209**	**0.0**
Beagle *(Canis lupus familiaris)*	4,344	0	2	**4,346**	**0.2**
Other dog (Other Canis)	297	0	0	**297**	**0.0**
Ferret *(Mustela putorius furo)*	626	0	0	**626**	**0.0**
Other carnivore *(other Carnivora)*	496	0	0	**496**	**0.0**
Horse and other equid *(Equidae)*	8,356	0	0	**8,356**	**0.4**
Pig *(Sus scrofa domesticus)*	5,505	17	4	**5,526**	**0.3**
Goat *(Capra aegagrus hircus)*	105	0	0	**105**	**0.0**
Sheep *(Ovis aries)*	46,548	7	0	**46,555**	**2.2**
Cattle *(Bos primigenius)*	3,161	0	0	**3,161**	**0.2**
Primate					
New World monkey					
Marmoset and tamarin	131	0	0	**131**	**0.0**
Old World monkey					
Cynomolgus monkey (*Macaca fascicularis*)	3,333	0	0	**3,333**	**0.2**
Rhesus monkey (*Macaca mulatta*)	148	0	0	**148**	**0.0**
Other mammal *(other Mammalia)*	375	0	0	**375**	**0.0**
Bird					
Domestic fowl (*Gallus domesticus*)	126,391	158	114	**126,663**	**6.1**
Quail *(Coturnix coturnix)*	0	0	0	**0**	**0.0**
Other bird *(other Aves)*	14,061	0	0	**14,061**	**0.7**
Reptile *(Reptilia)*	0	0	0	**0**	**0.0**
Amphibian					
Rana *(temporaria and pipiens)*	378	0	0	**378**	**0.0**
Xenopus *(laevis and tropicalis)*	7,259	871	0	**8,130**	**0.4**
Other amphibian *(other Amphibia)*	1,825	0	0	**1,825**	**0.1**
Fish					
Zebrafish *(Danio rerio)*	50,111	91,555	6,094	**147,760**	**7.1**
Other fish *(other Pisces)*	145,688	108	0	**145,796**	**7.0**
Cephalopod *(Cephalopoda)*	0	0	0	**0**	**0.0**
Total	**1,360,222**	**572,694**	**147,054**	**2,079,970**	**100.0**
% of total	**65.4**	**27.5**	**7.1**	**100.0**	

Table 5 Experimental procedures (non-regulatory) by species of animal: basic research

Great Britain 2015

Species of animal	Basic Research													Total	% of total
	Oncology	Cardiovascular Blood and Lymphatic System	Nervous System	Respiratory System	Gastrointestinal System including Liver	Musculoskeletal System	Immune System	Urogenital/ Reproductive System	Sensory Organs (skin, eyes and ears)	Endocrine System/ Metabolism	Multisystemic	Ethology / Animal Behaviour /Animal	Other		
Mammal															
Mouse *(Mus musculus)*	110,316	65,163	152,942	19,434	18,641	22,105	198,853	39,342	18,190	25,790	97,200	6,933	36,170	**811,079**	**73.6**
Rat *(Rattus norvegicus)*	782	6,037	27,064	9,416	1,109	419	1,099	567	511	2,901	4,508	1,664	374	**56,451**	**5.1**
Guinea-pig *(Cavia porcellus)*	0	155	99	701	0	0	30	16	154	0	65	0	12	**1,232**	**0.1**
Hamster (Syrian) (*Mesocricetus auratus*)	56	0	54	0	56	0	133	0	0	0	4	0	63	**366**	**0.0**
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Mongolian Gerbil *(Meriones unguiculatus)*	0	0	20	0	0	0	0	0	43	0	0	0	187	**250**	**0.0**
Other rodent *(other Rodentia)*	123	0	3	0	0	0	1,112	0	12	106	36	114	0	**1,506**	**0.1**
Rabbit *(Oryctolagus cuniculus)*	0	562	13	3	51	2	254	0	47	1	211	0	224	**1,368**	**0.1**
Cat *(Felis catus)*	0	109	1	0	8	0	10	0	0	26	30	0	4	**188**	**0.0**
Beagle *(Canis lupus familiaris)*	0	0	0	0	27	0	0	0	0	0	22	0	0	**49**	**0.0**
Other dog (Other Canis)	6	0	0	0	38	64	0	0	0	0	92	0	81	**281**	**0.0**
Ferret *(Mustela putorius furo)*	0	0	32	18	0	0	0	0	20	0	0	0	56	**126**	**0.0**
Other carnivore *(other Carnivora)*	0	0	0	0	0	0	0	36	0	0	9	85	0	**130**	**0.0**
Horse and other equid *(Equidae)*	0	0	0	6	0	22	281	0	0	232	0	0	0	**541**	**0.0**
Pig *(Sus scrofa domesticus)*	0	190	12	37	200	0	217	5	0	0	278	0	0	**939**	**0.1**
Goat *(Capra aegagrus hircus)*	0	0	2	0	0	0	30	5	0	0	0	0	0	**37**	**0.0**
Sheep *(Ovis aries)*	0	92	116	177	101	19	125	152	0	0	364	595	2,347	**4,088**	**0.4**
Cattle *(Bos primigenius)*	0	0	50	0	206	0	288	25	0	0	152	97	6	**824**	**0.1**
Primate															
New World monkey															
Marmoset and tamarin	0	0	65	0	0	0	0	0	0	0	37	0	0	**102**	**0.0**
Old World monkey															
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0	0	9	0	0	0	1	0	4	**14**	**0.0**
Rhesus monkey (*Macaca mulatta*)	0	61	29	0	0	0	12	0	0	0	0	0	6	**108**	**0.0**
Other mammal *(other Mammalia)*	0	0	0	0	0	0	4	20	0	0	0	217	53	**294**	**0.0**
Bird															
Domestic fowl (*Gallus domesticus*)	411	698	0	20	1,025	31	1,194	0	114	0	404	60	3,460	**7,417**	**0.7**
Quail *(Coturnix coturnix)*	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other bird *(other Aves)*	0	558	3	0	0	37	238	102	0	223	3,940	4,714	32	**9,847**	**0.9**
Reptile *(Reptilia)*	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Amphibian															
Rana *(temporaria and pipiens)*	0	0	0	0	0	0	0	0	0	0	0	378	0	**378**	**0.0**
Xenopus *(laevis and tropicalis)*	44	284	1,173	0	0	1	0	1,571	190	31	426	0	4,410	**8,130**	**0.7**
Other amphibian *(other Amphibia)*	0	0	0	0	0	369	0	0	0	0	0	1,456	0	**1,825**	**0.2**
Fish															
Zebrafish *(Danio rerio)*	9,365	9,828	45,390	54	0	2,310	9,884	14	4,485	100	5,468	3,569	6,733	**97,200**	**8.8**
Other fish *(other Pisces)*	0	24	120	0	0	2	5,217	3,755	0	0	18,782	69,426	0	**97,326**	**8.8**
Cephalopod *(Cephalopoda)*	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Total	**121,103**	**83,761**	**227,188**	**29,866**	**21,462**	**25,381**	**218,990**	**45,610**	**23,766**	**29,410**	**132,029**	**89,308**	**54,222**	**1,102,096**	**100.0**
% of total	**11.0**	**7.6**	**20.6**	**2.7**	**1.9**	**2.3**	**19.9**	**4.1**	**2.2**	**2.7**	**12.0**	**8.1**	**4.9**	**100.0**	

Table 6 Experimental procedures (non-regulatory) by species of animal: translational/applied research, page 1 of 2

Great Britain 2015

Species of animal	Translational/applied research								
	Human Cancer	Human Infectious Disorders	Human Cardiovascular Disorders	Human Nervous and Mental Disorders	Human Respiratory Disorders	Human Gastrointestinal Disorders including Liver	Human Musculoskeletal Disorders	Human Immune Disorders	Human Urogenital/ Reproductive Disorders
Mammal									
Mouse *(Mus musculus)*	73,601	40,492	4,765	19,176	6,540	5,364	1,838	16,818	984
Rat *(Rattus norvegicus)*	998	5,594	1,916	20,872	1,502	703	370	1,658	0
Guinea-pig *(Cavia porcellus)*	0	233	6	1	1,235	0	0	0	53
Hamster (Syrian) (*Mesocricetus auratus*)	0	277	0	0	0	0	0	0	0
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	0	0	0	0	0	0
Mongolian Gerbil *(Meriones unguiculatus)*	0	20	0	0	0	0	0	0	0
Other rodent *(other Rodentia)*	0	0	0	0	0	0	0	0	0
Rabbit *(Oryctolagus cuniculus)*	0	277	0	8	32	16	92	2	0
Cat *(Felis catus)*	0	0	0	0	0	0	0	0	0
Beagle *(Canis lupus familiaris)*	0	0	0	0	1	0	2	27	0
Other dog (Other Canis)	0	0	0	0	0	0	0	0	0
Ferret *(Mustela putorius furo)*	0	477	0	0	0	0	0	0	0
Other carnivore *(other Carnivora)*	0	0	0	0	0	0	0	0	0
Horse and other equid *(Equidae)*	0	0	0	0	0	0	0	0	0
Pig *(Sus scrofa domesticus)*	0	0	46	53	50	30	0	47	57
Goat *(Capra aegagrus hircus)*	0	0	0	0	0	0	0	0	0
Sheep *(Ovis aries)*	0	42	0	16	0	0	260	0	66
Cattle *(Bos primigenius)*	0	31	0	0	0	0	0	0	0
Primate									
New World monkey									
Marmoset and tamarin	0	0	0	0	0	0	0	0	0
Old World monkey									
Cynomolgus monkey (*Macaca fascicularis*)	0	74	0	0	4	0	0	0	0
Rhesus monkey (*Macaca mulatta*)	0	29	0	8	0	0	0	0	0
Other mammal *(other Mammalia)*	0	0	0	0	0	0	0	0	0
Bird									
Domestic fowl (*Gallus domesticus*)	509	0	0	0	0	0	0	0	0
Quail *(Coturnix coturnix)*	0	0	0	0	0	0	0	0	0
Other bird *(other Aves)*	0	54	0	0	0	0	0	0	0
Reptile *(Reptilia)*	0	0	0	0	0	0	0	0	0
Amphibian									
Rana *(temporaria and pipiens)*	0	0	0	0	0	0	0	0	0
Xenopus *(laevis and tropicalis)*	0	0	0	0	0	0	0	0	0
Other amphibian *(other Amphibia)*	0	0	0	0	0	0	0	0	0
Fish									
Zebrafish *(Danio rerio)*	0	12,082	714	15,316	0	0	0	0	2,324
Other fish *(other Pisces)*	4	0	0	0	0	0	0	0	0
Cephalopod *(Cephalopoda)*	0	0	0	0	0	0	0	0	0
Total	**75,112**	**59,682**	**7,447**	**55,450**	**9,364**	**6,113**	**2,562**	**18,552**	**3,484**
% of total	**18.7**	**14.9**	**1.9**	**13.8**	**2.3**	**1.5**	**0.6**	**4.6**	**0.9**

Table 6 Experimental procedures (non-regulatory) by species of animal: Translational/applied research, page 2 of 2

Great Britain 2015

Species of animal	Translational/applied research								Total	% of total
	Human Sensory Organ Disorders (skin, eyes and ears)	Human Endocrine/ Metabolism Disorders	Other Human Disorders	Animal Diseases and Disorders	Animal Welfare	Diagnosis of diseases	Plant diseases	Non-regulatory toxicology and ecotoxicology		
Mammal										
Mouse *(Mus musculus)*	9,944	3,168	56,884	917	68	1,965	6	3,460	**245,990**	**61.2**
Rat *(Rattus norvegicus)*	284	1,770	11,897	25	380	131	0	7,215	**55,315**	**13.8**
Guinea-pig *(Cavia porcellus)*	0	0	13,507	0	0	55	0	5	**15,095**	**3.8**
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	0	0	0	0	0	1	**278**	**0.1**
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	0	0	0	0	0	**0**	**0.0**
Mongolian Gerbil *(Meriones unguiculatus)*	0	0	0	8	0	0	0	0	**28**	**0.0**
Other rodent *(other Rodentia)*	0	0	0	0	0	0	0	0	**0**	**0.0**
Rabbit *(Oryctolagus cuniculus)*	28	0	969	210	10	33	3	183	**1,863**	**0.5**
Cat *(Felis catus)*	0	0	0	15	0	6	0	0	**21**	**0.0**
Beagle *(Canis lupus familiaris)*	0	0	277	6	0	0	0	473	**786**	**0.2**
Other dog *(Other Canis)*	0	0	0	16	0	0	0	0	**16**	**0.0**
Ferret *(Mustela putorius furo)*	0	0	0	0	0	9	0	0	**486**	**0.1**
Other carnivore *(other Carnivora)*	0	0	0	212	0	0	0	0	**212**	**0.1**
Horse and other equid *(Equidae)*	0	0	0	76	26	0	0	0	**102**	**0.0**
Pig *(Sus scrofa domesticus)*	29	8	19	415	863	0	0	67	**1,684**	**0.4**
Goat *(Capra aegagrus hircus)*	0	0	0	0	37	0	0	0	**37**	**0.0**
Sheep *(Ovis aries)*	0	0	0	3,107	8	46	0	14	**3,559**	**0.9**
Cattle *(Bos primigenius)*	0	0	0	336	313	42	0	0	**722**	**0.2**
Primate										
New World monkey										
Marmoset and tamarin	0	0	12	0	0	0	0	17	**29**	**0.0**
Old World monkey										
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0	0	0	101	**179**	**0.0**
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0	0	0	0	**37**	**0.0**
Other mammal *(other Mammalia)*	0	0	0	0	0	0	0	0	**0**	**0.0**
Bird										
Domestic fowl (*Gallus domesticus*)	0	0	271	5,304	460	0	0	14	**6,558**	**1.6**
Quail *(Coturnix coturnix)*	0	0	0	0	0	0	0	0	**0**	**0.0**
Other bird *(other Aves)*	0	0	165	980	0	440	0	0	**1,639**	**0.4**
Reptile *(Reptilia)*	0	0	0	0	0	0	0	0	**0**	**0.0**
Amphibian										
Rana *(temporaria and pipiens)*	0	0	0	0	0	0	0	0	**0**	**0.0**
Xenopus *(laevis and tropicalis)*	0	0	0	0	0	0	0	0	**0**	**0.0**
Other amphibian *(other Amphibia)*	0	0	0	0	0	0	0	0	**0**	**0.0**
Fish										
Zebrafish *(Danio rerio)*	1	367	0	0	0	0	0	16,209	**47,013**	**11.7**
Other fish *(other Pisces)*	0	0	0	16,212	3,118	365	0	463	**20,162**	**5.0**
Cephalopod *(Cephalopoda)*	0	0	0	0	0	0	0	0	**0**	**0.0**
Total	**10,286**	**5,313**	**84,001**	**27,839**	**5,283**	**3,092**	**9**	**28,222**	**401,811**	**100.0**
% of total	**2.6**	**1.3**	**20.9**	**6.9**	**1.3**	**0.8**	**0.0**	**7.0**	**100.0**	

Table 7.1 Experimental procedures by species of animal: regulatory use

Great Britain 2015

Species of animal	Routine Production			Quality control				Other efficacy and tolerance testing	Toxicity and other safety testing including pharmacology	Total	% of total
	Blood based products	Monoclonal antibody production (ascites)	Other	Batch safety testing	Pyrogenicity testing	Batch potency testing	Other quality controls				
Mammal											
Mouse *(Mus musculus)*	150	0	0	15,027	0	144,957	9,611	1,425	34,453	**205,623**	**37.0**
Rat *(Rattus norvegicus)*	770	0	0	60	0	680	288	625	142,100	**144,523**	**26.0**
Guinea-pig *(Cavia porcellus)*	0	0	0	896	0	2,443	1,190	0	870	**5,399**	**1.0**
Hamster (Syrian) (*Mesocricetus auratus*)	7	0	0	0	0	0	352	11	486	**856**	**0.2**
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Mongolian Gerbil *(Meriones unguiculatus)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other rodent *(other Rodentia)*	0	0	0	0	0	0	0	0	112	**112**	**0.0**
Rabbit *(Oryctolagus cuniculus)*	178	0	461	40	2,609	1,121	6	85	6,422	**10,922**	**2.0**
Cat *(Felis catus)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Beagle *(Canis lupus familiaris)*	9	0	0	0	0	0	0	172	3,330	**3,511**	**0.6**
Other dog (Other Canis)	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Ferret *(Mustela putorius furo)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other carnivore *(other Carnivora)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Horse and other equid *(Equidae)*	2	0	7,656	0	0	0	0	55	0	**7,713**	**1.4**
Pig *(Sus scrofa domesticus)*	1	0	0	100	0	206	0	2,058	530	**2,895**	**0.5**
Goat *(Capra aegagrus hircus)*	14	0	0	0	0	0	0	0	17	**31**	**0.0**
Sheep *(Ovis aries)*	44	0	38,552	4	0	192	1	40	49	**38,882**	**7.0**
Cattle *(Bos primigenius)*	0	0	2	4	0	663	0	580	225	**1,474**	**0.3**
Primate											
New World monkey											
Marmoset and tamarin	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Old World monkey											
Cynomolgus monkey (*Macaca fascicularis*)	1,249	0	12	0	0	0	0	3	1,876	**3,140**	**0.6**
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0	0	0	0	3	**3**	**0.0**
Other mammal *(other Mammalia)*	4	0	0	0	0	0	0	0	0	**4**	**0.0**
Bird											
Domestic fowl (*Gallus domesticus*)	0	0	91,200	672	0	2,375	96	12,360	5,985	**112,688**	**20.3**
Quail *(Coturnix coturnix)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other bird *(other Aves)*	0	0	0	0	0	0	0	960	446	**1,406**	**0.3**
Reptile *(Reptilia)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Amphibian											
Rana *(temporaria and pipiens)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Xenopus *(laevis and tropicalis)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other amphibian *(other Amphibia)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Fish											
Zebrafish *(Danio rerio)*	0	0	0	0	0	0	0	0	505	**505**	**0.1**
Other fish *(other Pisces)*	0	0	0	0	0	1,813	336	0	13,884	**16,033**	**2.9**
Cephalopod *(Cephalopoda)*	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Total	**2,428**	**0**	**137,883**	**16,803**	**2,609**	**154,450**	**11,880**	**18,374**	**211,293**	**555,720**	**100.0**
% of total	**0.4**	**0.0**	**24.8**	**3.0**	**0.5**	**27.8**	**2.1**	**3.3**	**38.0**	**100.0**	

Table 7.2 Experimental procedures by species of animal: regulatory use by legislative requirement

Great Britain 2015

Species of animal	Testing by legislation										Total	% of total
	Legislation on medicinal products for human use	Legislation on medicinal products for veterinary use and their residues	Medical devices legislation	Industrial chemicals legislation	Plant protection product legislation	Biocides legislation	Food legislation including food contact material	Feed legislation including legislation for the safety of target animals, workers and environment	Cosmetics legislation	Other		
Mammal												
Mouse	187,037	9,388	1,075	3,818	3,186	846	12	17	0	244	**205,623**	**37.0**
Rat	60,899	875	7	64,452	15,418	696	1,575	46	0	555	**144,523**	**26.0**
All other rodent	5,291	946	11	0	119	0	0	0	0	0	**6,367**	**1.1**
Rabbit	6,446	1,217	870	450	525	8	4	4	0	1,398	**10,922**	**2.0**
Cat	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Dog	3,024	263	0	4	8	0	0	0	0	212	**3,511**	**0.6**
Ferret	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other carnivore	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Horse and other equid	0	55	1,488	0	0	0	0	0	0	6,170	**7,713**	**1.4**
Pig	458	2,436	0	0	1	0	0	0	0	0	**2,895**	**0.5**
All other ungulate	14	1,570	4,853	0	139	0	0	85	0	33,726	**40,387**	**7.3**
Primate												
New World monkey	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Old World monkey	3,130	0	0	0	0	0	0	0	0	13	**3,143**	**0.6**
All other mammal	0	0	4	0	0	0	0	0	0	0	**4**	**0.0**
Bird	64	107,403	0	0	808	0	0	5,819	0	0	**114,094**	**20.5**
Reptile, amphibian	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Fish	3,787	3,983	0	6,916	1,852	0	0	0	0	0	**16,538**	**3.0**
Cephalopod	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Total	**270,150**	**128,136**	**8,308**	**75,640**	**22,056**	**1,550**	**1,591**	**5,971**	**0**	**42,318**	**555,720**	**100.0**
% of total	**48.6**	**23.1**	**1.5**	**13.6**	**4.0**	**0.3**	**0.3**	**1.1**	**0.0**	**7.6**	**100.0**	

Table 7.3 Experimental procedures by species of animal: regulatory use by origin of legislative requirement

Great Britain 2015

Species of animal	Legislative requirement			Total	% of total
	Legislation satisfying EU requirements	Legislation satisfying only UK requirements	Legislation satisfying Non-EU requirements only		
Mammal					
Mouse *(Mus musculus)*	189,816	0	15,807	**205,623**	**37.0**
Rat *(Rattus norvegicus)*	143,627	0	896	**144,523**	**26.0**
Guinea-pig *(Cavia porcellus)*	4,798	0	601	**5,399**	**1.0**
Hamster (Syrian) (*Mesocricetus auratus*)	676	0	180	**856**	**0.2**
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	**0**	**0.0**
Mongolian Gerbil *(Meriones unguiculatus)*	0	0	0	**0**	**0.0**
Other rodent *(other Rodentia)*	112	0	0	**112**	**0.0**
Rabbit *(Oryctolagus cuniculus)*	10,616	0	306	**10,922**	**2.0**
Cat *(Felis catus)*	0	0	0	**0**	**0.0**
Beagle *(Canis lupus familiaris)*	3,511	0	0	**3,511**	**0.6**
Other dog (Other Canis)	0	0	0	**0**	**0.0**
Ferret *(Mustela putorius furo)*	0	0	0	**0**	**0.0**
Other carnivore *(other Carnivora)*	0	0	0	**0**	**0.0**
Horse and other equid *(Equidae)*	7,713	0	0	**7,713**	**1.4**
Pig *(Sus scrofa domesticus)*	2,895	0	0	**2,895**	**0.5**
Goat *(Capra aegagrus hircus)*	17	14	0	**31**	**0.0**
Sheep *(Ovis aries)*	38,837	45	0	**38,882**	**7.0**
Cattle *(Bos primigenius)*	1,474	0	0	**1,474**	**0.3**
Primate					
New World monkey					
Marmoset and tamarin	0	0	0	**0**	**0.0**
Old World monkey					
Cynomolgus monkey (*Macaca fascicularis*)	3,140	0	0	**3,140**	**0.6**
Rhesus monkey (*Macaca mulatta*)	3	0	0	**3**	**0.0**
Other mammal *(other Mammalia)*	0	4	0	**4**	**0.0**
Bird					
Domestic fowl (*Gallus domesticus*)	111,512	0	1,176	**112,688**	**20.3**
Quail *(Coturnix coturnix)*	0	0	0	**0**	**0.0**
Other bird *(other Aves)*	1,292	98	16	**1,406**	**0.3**
Reptile *(Reptilia)*	0	0	0	**0**	**0.0**
Amphibian					
Rana *(temporaria and pipiens)*	0	0	0	**0**	**0.0**
Xenopus *(laevis and tropicalis)*	0	0	0	**0**	**0.0**
Other amphibian *(other Amphibia)*	0	0	0	**0**	**0.0**
Fish					
Zebrafish *(Danio rerio)*	505	0	0	**505**	**0.1**
Other fish *(other Pisces)*	15,975	0	58	**16,033**	**2.9**
Cephalopod *(Cephalopoda)*	0	0	0	**0**	**0.0**
Total	**536,519**	**161**	**19,040**	**555,720**	**100.0**
% of total	**96.5**	**0.0**	**3.4**	**100.0**	

Table 7.4 Experimental procedures by species of animal: regulatory use by type of test - toxicity and other safety testing including pharmacology, page 1 of 2

Great Britain 2015

Species of animal	Acute and sub-acute toxicity testing methods			Other type of regulatory test or procedure									
	LD50 and LC50	Other lethal methods	Non-lethal methods	Skin irritation/corrosion	Skin sensitisation	Eye irritation/corrosion	Repeated dose toxicity	Carcinogenicity	Genotoxicity	Reproductive toxicity	Developmental toxicity	Safety testing in food and feed area	Target animal safety
Mammal													
Mouse	7,190	0	1,940	0	5,304	0	9,636	6,505	1,596	118	107	0	0
Rat	1,246	285	3,568	24	0	0	29,597	9,260	3,739	24,182	61,649	0	0
All other rodent	0	0	863	0	0	0	453	0	0	0	0	0	0
Rabbit	0	0	135	310	0	173	395	0	0	2,542	2,641	23	0
Cat	0	0	0	0	0	0	0	0	0	0	0	0	0
Dog	0	0	254	0	0	0	2,454	0	0	0	14	0	49
Ferret	0	0	0	0	0	0	0	0	0	0	0	0	0
Other carnivore	0	0	0	0	0	0	0	0	0	0	0	0	0
Horse and other equid	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig	0	0	93	6	0	0	288	0	0	0	0	0	0
All other ungulate	0	0	0	0	0	0	0	0	0	0	0	62	40
Primate													
New World monkey	0	0	0	0	0	0	0	0	0	0	0	0	0
Old World monkey	0	0	79	0	0	0	1,330	0	0	0	0	0	0
All other mammal	0	0	0	0	0	0	0	0	0	0	0	0	0
Bird	0	0	0	0	0	0	0	0	0	0	0	173	5,593
Reptile, amphibian	0	0	0	0	0	0	0	0	0	0	0	0	0
Fish	462	0	0	0	0	0	0	0	0	0	403	0	1,322
Cephalopod	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**8,898**	**285**	**6,932**	**340**	**5,304**	**173**	**44,153**	**15,765**	**5,335**	**26,842**	**64,814**	**258**	**7,004**
% of total	**4.2**	**0.1**	**3.3**	**0.2**	**2.5**	**0.1**	**20.9**	**7.5**	**2.5**	**12.7**	**30.7**	**0.1**	**3.3**

Table 7.4 Experimental procedures by species of animal: regulatory use by type of test - toxicity and other safety testing including pharmacology, page 2 of 2

Great Britain 2015

Species of animal	Other type of regulatory test or procedure				Ecotoxicity						Other type of toxicity or safety test	Total	% of total
	Neurotoxicity	Kinetics	Pharmo-dynamics	Phototoxicity	Acute toxicity	Chronic toxicity	Reproductive toxicity	Endocrine activity	Bioaccumulation	Other			
Mammal													
Mouse	0	318	480	0	29	0	0	0	0	0	1,230	**34,453**	**16.3**
Rat	395	3,576	2,831	0	154	0	0	0	0	0	1,594	**142,100**	**67.3**
All other rodent	0	7	0	0	0	0	0	0	0	112	33	**1,468**	**0.7**
Rabbit	0	30	72	0	0	0	0	0	0	0	101	**6,422**	**3.0**
Cat	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Dog	0	30	233	0	0	0	0	0	0	0	296	**3,330**	**1.6**
Ferret	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other carnivore	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Horse and other equid	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Pig	0	96	22	0	0	0	0	0	0	2	23	**530**	**0.3**
All other ungulate	0	188	0	0	0	0	0	0	0	0	1	**291**	**0.1**
Primate													
New World monkey	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Old World monkey	0	177	90	0	0	0	0	0	0	0	203	**1,879**	**0.9**
All other mammals	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Bird	0	189	0	0	292	0	0	0	0	154	30	**6,431**	**3.0**
Reptile, amphibian	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Fish	0	0	512	0	3,677	6,816	0	932	265	0	0	**14,389**	**6.8**
Cephalopod	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Total	**395**	**4,611**	**4,240**	**0**	**4,152**	**6,816**	**0**	**932**	**265**	**268**	**3,511**	**211,293**	**100.0**
% of total	**0.2**	**2.2**	**2.0**	**0.0**	**2.0**	**3.2**	**0.0**	**0.4**	**0.1**	**0.1**	**1.7**	**100.0**	

Table 8 Creation of new lines and maintenance of established lines of genetically altered animals (not used in experimental procedures) by species of animal, severity and genetic status[1]

Great Britain 2015

Species of animal	Actual severity	Genetic status			Total	% of total
		Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Mouse	Sub threshold	24,113	747,576	186,707	958,396	54.0
	Non - recovery	53	2,735	50	2,838	0.2
	Mild	89,719	377,551	240,971	708,241	39.9
	Moderate	10,428	22,300	25,902	58,630	3.3
	Severe	232	25,398	19,931	45,561	2.6
	Total	**124,545**	**1,175,560**	**473,561**	**1,773,666**	**100.0**
Rat	Sub threshold	6	3,000	962	3,968	36.5
	Non - recovery	0	104	0	104	1.0
	Mild	212	1,366	4,405	5,983	55.1
	Moderate	16	246	6	268	2.5
	Severe	9	134	391	534	4.9
	Total	**243**	**4,850**	**5,764**	**10,857**	**100.0**
Pig	Sub threshold	0	121	0	121	40.2
	Non - recovery	0	0	0	0	0.0
	Mild	0	18	0	18	6.0
	Moderate	162	0	0	162	53.8
	Severe	0	0	0	0	0.0
	Total	**162**	**139**	**0**	**301**	**100.0**
Sheep	Sub threshold	0	7	0	7	22.6
	Non - recovery	0	0	0	0	0.0
	Mild	0	8	0	8	25.8
	Moderate	16	0	0	16	51.6
	Severe	0	0	0	0	0.0
	Total	**16**	**15**	**0**	**31**	**100.0**
Other mammal	Sub threshold	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0.0
	Mild	0	0	0	0	0.0
	Moderate	4	0	0	4	12.9
	Severe	0	0	0	0	0.0
	Total	**4**	**0**	**0**	**4**	**12.9**
Bird	Sub threshold	7	162	0	169	24.1
	Non - recovery	0	0	0	0	0.0
	Mild	54	387	0	441	62.9
	Moderate	0	0	58	58	8.3
	Severe	0	0	33	33	4.7
	Total	**61**	**549**	**91**	**701**	**100.0**
Amphibian	Sub threshold	0	1,786	0	1,786	19.3
	Non - recovery	0	0	0	0	0.0
	Mild	0	7,032	0	7,032	76.2
	Moderate	0	374	0	374	4.1
	Severe	0	41	0	41	0.4
	Total	**0**	**9,233**	**0**	**9,233**	**100.0**
Fish	Sub threshold	2,658	153,121	5,860	161,639	60.3
	Non - recovery	153	239	0	392	0.1
	Mild	5,060	75,474	3,677	84,211	31.4
	Moderate	1,059	4,596	271	5,926	2.2
	Severe	381	15,081	238	15,700	5.9
	Total	**9,311**	**248,511**	**10,046**	**267,868**	**100.0**
All species	Sub threshold	26,784	905,773	193,529	1,126,086	54.6
	Non - recovery	206	3,078	50	3,334	0.2
	Mild	95,045	461,836	249,053	805,934	39.1
	Moderate	11,685	27,516	26,237	65,438	3.2
	Severe	622	40,654	20,593	61,869	3.0
	Total	**134,342**	**1,438,857**	**489,462**	**2,062,661**	**100.0**

1. Some species were not involved in the creation/breeding of genetically altered animals in 2015. Therefore, these species are not listed in this table.

Table 9.1 Creation of new lines of genetically altered animals (not used in experimental procedures) by species of animal, severity and genetic status[1]

Great Britain 2015

Species of animal	Actual severity	Basic research by genetic status			Translational/applied research by genetic status			Total by genetic status			Total	% of total
		Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype	Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype	Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Mouse	Sub threshold	5,063	86,312	16,728	0	3,913	0	5,063	90,225	16,728	112,016	45.5
	Non - recovery	27	987	50	0	86	0	27	1,073	50	1,150	0.5
	Mild	41,550	30,691	40,320	8	2,205	0	41,558	32,896	40,320	114,774	46.6
	Moderate	6,690	4,422	4,666	406	207	15	7,096	4,629	4,681	16,406	6.7
	Severe	13	1,267	621	0	165	0	13	1,432	621	2,066	0.8
	Total	**53,343**	**123,679**	**62,385**	**414**	**6,576**	**15**	**53,757**	**130,255**	**62,400**	**246,412**	**100.0**
Rat	Sub threshold	0	12	0	0	0	0	0	12	0	12	5.1
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	18	189	0	0	0	0	18	189	0	207	87.7
	Moderate	16	0	1	0	0	0	16	0	1	17	7.2
	Severe	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**34**	**201**	**1**	**0**	**0**	**0**	**34**	**201**	**1**	**236**	**100.0**
Pig	Sub threshold	0	114	0	0	0	0	0	114	0	114	38.8
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	18	0	0	0	0	0	18	0	18	6.1
	Moderate	162	0	0	0	0	0	162	0	0	162	55.1
	Severe	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**162**	**132**	**0**	**0**	**0**	**0**	**162**	**132**	**0**	**294**	**100.0**
Sheep	Sub threshold	0	7	0	0	0	0	0	7	0	7	22.6
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	8	0	0	0	0	0	8	0	8	25.8
	Moderate	16	0	0	0	0	0	16	0	0	16	51.6
	Severe	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**16**	**15**	**0**	**0**	**0**	**0**	**16**	**15**	**0**	**31**	**100.0**
Other mammal	Sub threshold	0	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0	0.0
	Moderate	4	0	0	0	0	0	4	0	0	4	100.0
	Severe	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**4**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**4**	**100.0**
Bird	Sub threshold	7	38	0	0	24	0	7	62	0	69	24.7
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	49	83	0	5	73	0	54	156	0	210	75.3
	Moderate	0	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**56**	**121**	**0**	**5**	**97**	**0**	**61**	**218**	**0**	**279**	**100.0**
Amphibian	Sub threshold	0	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	6,976	0	0	0	0	0	6,976	0	6,976	96.1
	Moderate	0	283	0	0	0	0	0	283	0	283	3.9
	Severe	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**7,259**	**0**	**0**	**0**	**0**	**0**	**7,259**	**0**	**7,259**	**100.0**
Fish	Sub threshold	1,910	15,559	454	0	227	0	1,910	15,786	454	18,150	37.1
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	460	23,003	650	0	586	0	460	23,589	650	24,699	50.4
	Moderate	965	1,762	40	0	130	0	965	1,892	40	2,897	5.9
	Severe	13	2,872	39	0	313	0	13	3,185	39	3,237	6.6
	Total	**3,348**	**43,196**	**1,183**	**0**	**1,256**	**0**	**3,348**	**44,452**	**1,183**	**48,983**	**100.0**
All species	Sub threshold	6,980	102,042	17,182	0	4,164	0	6,980	106,206	17,182	130,368	43.0
	Non - recovery	27	987	50	0	86	0	27	1,073	50	1,150	0.4
	Mild	42,077	60,968	40,970	13	2,864	0	42,090	63,832	40,970	146,892	48.4
	Moderate	7,853	6,467	4,707	406	337	15	8,259	6,804	4,722	19,785	6.5
	Severe	26	4,139	660	0	478	0	26	4,617	660	5,303	1.7
	Total	**56,963**	**174,603**	**63,569**	**419**	**7,929**	**15**	**57,382**	**182,532**	**63,584**	**303,498**	**100.0**

1. Some species were not involved in the creation of genetically altered animals in 2015. Therefore, these species are not listed in this table.

Table 9.2 Creation of new lines of genetically altered animals (not used in experimental procedures) by species of animal and severity: basic research[1]

Great Britain 2015

Species of animal	Actual severity	Basic Research													Total	% of total
		Oncology	Cardiovascular Blood and Lymphatic System	Nervous System	Respiratory System	Gastrointestinal System including Liver	Musculoskeletal System	Immune System	Urogenital/ Reproductive System	Sensory Organs (skin, eyes and ears)	Endocrine System/ Metabolism	Multisystemic	Ethology / Animal Behaviour /Animal Biology	Other		
Mouse	Sub threshold	25,981	1,863	7,490	20	4,928	706	13,098	2,051	1,565	2,433	37,924	159	9,885	108,103	45.2
	Non - recovery	15	0	572	0	0	0	5	0	0	27	444	0	1	1,064	0.4
	Mild	6,553	3,041	7,146	137	489	878	9,191	1,603	1,799	1,658	74,600	69	5,397	112,561	47.0
	Moderate	2,692	352	1,044	0	100	293	1,713	695	247	259	5,022	14	3,347	15,778	6.6
	Severe	332	7	158	0	26	0	138	3	10	42	620	0	565	1,901	0.8
	Total	**35,573**	**5,263**	**16,410**	**157**	**5,543**	**1,877**	**24,145**	**4,352**	**3,621**	**4,419**	**118,610**	**242**	**19,195**	**239,407**	**100.0**
Rat	Sub threshold	0	0	0	0	12	0	0	0	0	0	0	0	0	12	5.1
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	19	0	0	0	0	0	188	207	87.7
	Moderate	0	0	0	0	0	0	17	0	0	0	0	0	0	17	7.2
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**12**	**0**	**36**	**0**	**0**	**0**	**0**	**0**	**188**	**236**	**100.0**
Pig	Sub threshold	0	0	0	20	0	0	80	0	0	0	14	0	0	114	38.8
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	15	0	0	0	3	0	0	18	6.1
	Moderate	0	0	0	0	0	0	0	0	0	0	162	0	0	162	55.1
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**20**	**0**	**0**	**95**	**0**	**0**	**0**	**179**	**0**	**0**	**294**	**100.0**
Sheep	Sub threshold	0	0	0	0	0	5	0	2	0	0	0	0	0	7	22.6
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	8	0	0	0	0	0	0	0	0	8	25.8
	Moderate	0	0	0	0	0	0	0	0	0	0	16	0	0	16	51.6
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**8**	**5**	**0**	**2**	**0**	**0**	**16**	**0**	**0**	**31**	**100.0**
Other mammal	Sub threshold	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	4	0	0	0	0	0	4	100.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**4**	**100.0**
Bird	Sub threshold	0	0	0	0	0	0	0	14	0	0	31	0	0	45	25.4
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	46	0	0	86	0	0	132	74.6
	Moderate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**60**	**0**	**0**	**117**	**0**	**0**	**177**	**100.0**
Amphibian	Sub threshold	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	541	0	0	0	0	0	0	0	0	6,200	0	235	6,976	96.1
	Moderate	0	0	0	0	0	0	0	0	0	0	0	0	283	283	3.9
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**541**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6,200**	**0**	**518**	**7,259**	**100.0**
Fish	Sub threshold	262	641	7,744	0	0	270	168	0	0	0	8,148	0	690	17,923	37.6
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	1,131	4,675	5,230	0	0	3,357	703	26	344	0	5,905	0	2,742	24,113	50.5
	Moderate	965	21	4	0	0	22	1,051	0	0	0	48	0	656	2,767	5.8
	Severe	0	1	244	0	0	4	43	0	0	0	2,605	0	27	2,924	6.1
	Total	**2,358**	**5,338**	**13,222**	**0**	**0**	**3,653**	**1,965**	**26**	**344**	**0**	**16,706**	**0**	**4,115**	**47,727**	**100.0**
All species	Sub threshold	26,243	2,504	15,234	40	4,940	981	13,346	2,067	1,565	2,433	46,117	159	10,575	126,204	42.8
	Non - recovery	15	0	572	0	0	0	5	0	0	27	444	0	1	1,064	0.4
	Mild	7,684	8,257	12,376	137	497	4,235	9,928	1,675	2,143	1,658	86,794	69	8,562	144,015	48.8
	Moderate	3,657	373	1,048	0	100	315	2,781	699	247	259	5,248	14	4,286	19,027	6.4
	Severe	332	8	402	0	26	4	181	3	10	42	3,225	0	592	4,825	1.6
	Total	**37,931**	**11,142**	**29,632**	**177**	**5,563**	**5,535**	**26,241**	**4,444**	**3,965**	**4,419**	**141,828**	**242**	**24,016**	**295,135**	**100.0**

1. Some species were not involved in the creation of genetically altered animals for basic research in 2015. Therefore, these species are not listed in this table.

Table 9.3 Creation of new lines of genetically altered animals (not used in experimental procedures) by species of animal and severity: translational/applied research [1]

Great Britain 2015

Species of animal	Actual severity	Translational/applied research																Total	% of total
		Human Cancer	Human Infectious Disorders	Human Cardiovascular Disorders	Human Nervous and Mental Disorders	Human Respiratory Disorders	Human Gastrointestinal Disorders including Liver	Human Musculoskeletal Disorders	Human Immune Disorders	Human Urogenital/ Reproductive Disorders	Human Sensory Organ Disorders (skin, eyes and ears)	Human Endocrine/ Metabolism Disorders	Other Human Disorders	Animal Diseases and Disorders	Animal Welfare	Diagnosis of diseases	Plant diseases	Non-regulatory toxicology and ecotoxicology		
Mouse	Sub threshold	3,419	0	111	21	0	0	0	297	51	14	0	0	0	0	0	0	0	3,913	55.9
	Non - recovery	0	0	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86	1.2
	Mild	1,816	0	8	33	0	0	0	344	1	0	0	11	0	0	0	0	0	2,213	31.6
	Moderate	380	0	0	0	0	0	0	26	130	0	15	73	0	0	4	0	0	628	9.0
	Severe	164	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	165	2.4
	Total	**5,779**	**0**	**205**	**54**	**0**	**0**	**0**	**668**	**182**	**14**	**15**	**84**	**0**	**0**	**4**	**0**	**0**	**7,005**	**100.0**
Bird	Sub threshold	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	24	23.5
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0	0	11	67	0	0	0	0	78	76.5
	Moderate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**91**	**0**	**0**	**0**	**0**	**102**	**100.0**
Fish	Sub threshold	0	227	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	227	18.1
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	586	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	586	46.7
	Moderate	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	130	10.4
	Severe	0	313	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	313	24.9
	Total	**0**	**1,256**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1,256**	**100.0**
All species	Sub threshold	3,419	227	111	21	0	0	0	297	51	14	0	0	24	0	0	0	0	4,164	49.8
	Non - recovery	0	0	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86	1.0
	Mild	1,816	586	8	33	0	0	0	344	1	0	0	22	67	0	0	0	0	2,877	34.4
	Moderate	380	130	0	0	0	0	0	26	130	0	15	73	0	0	4	0	0	758	9.1
	Severe	164	313	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	478	5.7
	Total	**5,779**	**1,256**	**205**	**54**	**0**	**0**	**0**	**668**	**182**	**14**	**15**	**95**	**91**	**0**	**4**	**0**	**0**	**8,363**	**100.0**

1. Some species were not involved in the creation of genetically altered animals for translational/applied research in 2015. Therefore, these species are not listed in this table.

Table 10 Maintenance of established lines of genetically altered animals (not used in experimental procedures) by species of animal, severity and genetic status[1]

Great Britain 2015

Species of animal	Actual severity	Genetic status			Total	% of total
		Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Mouse	Sub threshold	19,050	657,351	169,979	846,380	55.4
	Non - recovery	26	1,662	0	1,688	0.1
	Mild	48,161	344,655	200,651	593,467	38.9
	Moderate	3,332	17,671	21,221	42,224	2.8
	Severe	219	23,966	19,310	43,495	2.8
	Total	**70,788**	**1,045,305**	**411,161**	**1,527,254**	**100.0**
Rat	Sub threshold	6	2,988	962	3,956	37.2
	Non - recovery	0	104	0	104	1.0
	Mild	194	1,177	4,405	5,776	54.4
	Moderate	0	246	5	251	2.4
	Severe	9	134	391	534	5.0
	Total	**209**	**4,649**	**5,763**	**10,621**	**100.0**
Pig	Sub threshold	0	7	0	7	100.0
	Non - recovery	0	0	0	0	0.0
	Mild	0	0	0	0	0.0
	Moderate	0	0	0	0	0.0
	Severe	0	0	0	0	0.0
	Total	**0**	**7**	**0**	**7**	**100.0**
Bird	Sub threshold	0	100	0	100	23.7
	Non - recovery	0	0	0	0	0.0
	Mild	0	231	0	231	54.7
	Moderate	0	0	58	58	13.7
	Severe	0	0	33	33	7.8
	Total	**0**	**331**	**91**	**422**	**100.0**
Amphibian	Sub threshold	0	1,786	0	1,786	90.5
	Non - recovery	0	0	0	0	0.0
	Mild	0	56	0	56	2.8
	Moderate	0	91	0	91	4.6
	Severe	0	41	0	41	2.1
	Total	**0**	**1,974**	**0**	**1,974**	**100.0**
Fish	Sub threshold	748	137,335	5,406	143,489	65.6
	Non - recovery	153	239	0	392	0.2
	Mild	4,600	51,885	3,027	59,512	27.2
	Moderate	94	2,704	231	3,029	1.4
	Severe	368	11,896	199	12,463	5.7
	Total	**5,963**	**204,059**	**8,863**	**218,885**	**100.0**
All species	Sub threshold	19,804	799,567	176,347	995,718	56.6
	Non - recovery	179	2,005	0	2,184	0.1
	Mild	52,955	398,004	208,083	659,042	37.5
	Moderate	3,426	20,712	21,515	45,653	2.6
	Severe	596	36,037	19,933	56,566	3.2
	Total	**76,960**	**1,256,325**	**425,878**	**1,759,163**	**100.0**

1. Some species were not involved in the breeding of genetically altered animals in 2015. Therefore, these species are not listed in this table.

Table 11 Procedures and project licences by type of licensed establishment

Great Britain 2015

Type of licensed establishment	Number of project licences where countable[1] procedures were completed in 2015 by number of procedures									Number of project licences where only non-countable[1] procedures were completed in 2015	Number of project licences where no procedures were completed in 2015	Total number of project licences	Number of procedures	
	Number of procedures								Total				Total	% of total
	1 to 50	51 to 100	101 to 200	201 to 400	401 to 600	601 to 800	801 to 1,000	More than 1,000						
Public health laboratories	2	3	2	3	0	1	0	3	14	0	8	22	**9,366**	**0.2**
Universities, medical schools	337	226	240	258	161	111	84	494	1,911	8	547	2,466	**1,977,928**	**47.7**
NHS hospitals	3	2	4	2	0	3	1	5	20	0	4	24	**28,336**	**0.7**
Government departments	18	6	10	5	2	2	1	10	54	0	19	73	**81,771**	**2.0**
Other public bodies	28	15	14	18	13	9	6	63	166	1	37	204	**490,126**	**11.8**
Non-profit-making organisations	19	15	9	6	3	7	2	67	128	1	23	152	**515,472**	**12.4**
Commercial organisations	25	11	22	25	12	11	9	69	184	1	47	232	**1,039,632**	**25.1**
Total	**432**	**278**	**301**	**317**	**191**	**144**	**103**	**711**	**2,477**	**11**	**685**	**3,173**	**4,142,631**	**100.0**

1. Procedures on adult or free-living animals (including neonatal and juvenile mammals, and newly hatched birds) are counted.
Details of procedures on immature forms (e.g. larvae, embryos, fish fry) arenot counted unless they have reached the free-feeding stage (e.g. zebrafish fry from 5 days post-fertilisation and tadpoles).
Animals in the wild involved in rodenticide trials are also not counted. However, information is collected on the number of project licences which undertook rodenticide trials (2 returns in 2015).

Appendix A: Revisions and other supplementary information

Revisions

One revision was made to the 2014 data for table 7.4 'Experimental procedures by species of animal: regulatory by type of test – toxicity and other safety testing including pharmacology'. This involved 380 procedures on dogs being reclassified from 'ecotoxicity' to 'other type of toxicity or safety test'. This did not affect overall totals or totals for regulatory use (tables 1, 1A, 7.1). A revised version of table 7.4 for 2014 can be accessed online alongside the 2015 statistical release.

It is standard practice across all Home Office statistical releases to incorporate revisions to previous years' data in the latest release. Corrections and revisions follow the Home Office's statement of compliance with the Code of Practice for Official Statistics.[45]

Confidentiality

Detailed information on the work of individual project licence holders is not readily identifiable in this publication.

Uses of the statistics

The statistics are used to inform the development of policies on animal use in scientific work, and provide information for the scientific community, animal welfare organisations and the general public.

Acknowledgements

Statisticians in the Chief Statistician's Unit, which is part of the Home Office Science Group, prepared this statistical release. They are grateful for the contribution of project licence holders who provided the mandatory returns on which this report is based.

Further information

This statistical release is available online at: https://www.gov.uk/government/statistics/statistics-of-scientific-procedures-on-living-animals-great-britain-2015. The website also includes:

- data tables which include the (unrounded) 2015 figures detailed in this report;
- an accompanying user guide for the statistics.

Forthcoming publications are pre-announced on the statistics release calendar on the GOV.UK website: https://www.gov.uk/government/statistics/announcements.

[45] See: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/341674/ho-compliance-state-aug14.pdf, specifically, revisions and corrections section.

Information about research and testing using animals can be found at: https://www.gov.uk/research-and-testing-using-animals.

Information about the Animals in Science Committee can be found at: https://www.gov.uk/government/organisations/animals-in-science-committee.

Information about the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs) can be found at: http://www.nc3rs.org.uk/.

Information relating to Northern Ireland is published by the Department of Health and can be found at: https://www.health-ni.gov.uk/publications/statistics-scientific-procedures-living-animals-northern-ireland.

Feedback and enquiries

If you have any feedback or enquiries about this publication, please email the Chief Statistician's Unit, the Home Office Unit which produced the statistics, at: CSU.Statistics@homeoffice.gsi.gov.uk or write to: Chief Statistician's Unit, 1st Floor, Peel Building, 2 Marsham Street, London, SW1P 4DF.

Appendix B: General system of control under the Animals (Scientific Procedures) Act 1986

Introduction

1. The Animals (Scientific Procedures) Act 1986 puts into effect a rigorous system of controls on scientific work on living animals, including the need for:
    a. both the researcher and the project to be separately licensed;
    b. stringent safeguards on animal pain and suffering; and
    c. general requirements to ensure the care and welfare of animals.

    The Act implements the requirements of European Directive 2010/63/EU.

2. Operation of the Act is a reserved issue in Great Britain, with the Home Office administering the legislation in England, Scotland and Wales. The Act is separately administered in Northern Ireland.

Scope of the Act

3. The 1986 Act controls any experimental or other scientific procedure applied to a 'protected animal' that may have the effect of causing that animal pain, suffering, distress or lasting harm. Such work is referred to in the Act as a 'regulated procedure'.

4. 'Protected animals' are defined as all living vertebrate animals, except man, plus cephalopods. The definition extends to fetal, larval or embryonic forms that have reached specified stages in their development.

5. Under the Act, an animal is regarded as 'living' until "the permanent cessation of circulation or complete destruction of its brain". Procedures carried out on decerebrate animals are also subject to the controls of the Act.

6. The definition of a regulated procedure encompasses:
    a. most breeding of animals with genetic defects;
    b. production of antisera and other blood products;
    c. the maintenance and passage of tumours and parasites;
    d. the administration for a scientific purpose of an anaesthetic, analgesic, tranquilliser or other drug to dull perception.

    Killing an animal requires licence authority in certain circumstances.

7. The controls of the 1986 Act do not extend to procedures applied to animals in the course of:
    a. non-experimental clinical veterinary practice, non-experimental agricultural practice or practices undertaken for the purposes of recognised animal husbandry;
    b. the administration of any substance or article to an animal for research purposes in accordance with an animal test certificate granted under the Veterinary Medicines Regulations 2011;[46]
    c. the ringing, tagging or marking of an animal, or the application of

[46] S.I. 2011/2159.

any other humane procedure for the primary purpose of enabling an animal to be identified, provided that it causes only momentary pain or distress (or none at all) and no lasting harm.

8. Three kinds of licence are required for all work controlled by the 1986 Act. The procedures must be part of a programme of work authorised by a project licence and the person applying the regulated procedures must hold a personal licence. In addition, the place where the work is carried out must be licensed to do so. No work may be done unless the procedure, the animals used and the place where the work is to be done are specifically authorised in both project and personal licences.

Personal licences

9. A personal licence is the Home Secretary's endorsement that the holder is a suitable and competent person to carry out specified procedures on specified animals, under supervision where necessary. Applicants must be over 18 and are required to give details of their qualifications, training and experience. Those who have not previously held a Home Office licence need the endorsement of the named training and competency officer. Satisfactory completion of an accredited training course is also required before a personal licence will be issued.

10. The Home Office is in the process of moving from a paper-based to an electronic licensing system. Because of this, it has not been possible to identify the exact number of personal licences in force at the end of December 2015. It is expected in 2016 that it will possible to identify the number of personal licences held once the conversion to the electronic licensing system has been completed.

11. Nonetheless, on 31 December 2013, 16,112 active personal licences were in force. Personal licences continue to be in force until revoked but they must be reviewed at least every five years.

Project licences

12. A project licence is granted when the Home Secretary considers that the use of living animals in a programme of work, for a purpose permitted by the Act, is justified and the methods proposed appropriate.

13. In deciding whether and on what terms to authorise the project, the likely adverse effects on the animals used must be weighed against the potential benefits (to humans, other animals or the environment) that are expected to accrue from the work. Adequate consideration must also have been given to the feasibility of using alternative methods not involving living animals.

14. The holder of a project licence undertakes overall responsibility for the scientific direction and control of the work. New project licence applicants are required to complete an accredited training course before the licence will be granted.

Establishment licences

15. Except where otherwise authorised in a project licence (for example, for

field work at a specified place and time), any place where work is carried out under the Act must be licensed. Establishments that breed certain types of animal listed in Schedule 2 of the Act for use in scientific procedures ('breeding establishments'), and establishments that obtain such animals from elsewhere and supply them to laboratories ('supplying establishments') must hold an appropriate licence to do so. Animals listed in Schedule 2 are mice, rats, guinea pigs, hamsters, gerbils, rabbits, cats, dogs, ferrets, non-human primates, pigs (if genetically modified), sheep (if genetically modified), common quail (Coturnix coturnix), amphibians (of the species Xenopus laevis, Xenopus tropicalis, Rana temporaria and Rana pipiens), and zebrafish.

16. Licensed establishments are required to nominate a person to be responsible for the day-to-day care of animals and a veterinary surgeon to advise on their health and welfare.

17. There were 173 establishment licences in force on 31 December 2015. Of those, 172 were registered as user establishments, 114 as breeding establishments and 71 as supplying establishments. These figures add up to more than the total number of establishments because a single establishment may fall into more than one of the categories. For example, an establishment may be registered as both a breeder and user of animals.

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