Statistics of Scientific Procedures on Living Animals Northern Ireland 2019

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Prepared pursuant to section 21(7) of the Animals (Scientific Procedures) Act 1986 as adapted by section 29 of that Act

Contents

Introductory notes

Animals (Scientific Procedures) Act 1986 and key definitions

In the UK the use of animals in scientific procedures is regulated by the Animals (Scientific Procedures) Act 1986, 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 the Appendix.

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 the Northern Ireland Assembly.

Protected animals are defined in the 1986 Act 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, 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 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, which will be simply referred to as procedures from this point on, usually corresponds with the number of animals used. 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/EU7 sets out a common format for member states of the

European Union, which includes the UK – and therefore Northern Ireland – 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.

- Details of the actual severity are recorded for all procedures. This is an assessment of the severity that animals experienced as a result of the entire procedure and reflects the peak severity of that procedure.

- The species information was revised in 2013.

- Information on all cephalopods 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.

- 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.

- Statistics are collected on place of birth rather than on source.

- 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.

- Statistics 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.

Further information available

This statistical release is available online at the DoH website https://www.health-ni.gov.uk/

The Animals (Scientific Procedures) Act 1986 can be accessed at https://www.gov.uk/government/publications/consolidated-version-of-aspa-1986

European Directive 2010/63/EU can be found at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0063

https://publications.europa.eu/en/publication-detail/-/publication/36ef2c9c-33b4-11e2-84d0-01aa75ed71a1/language-en

Description of Statistical Tables

1.   Project holders were asked to answer detailed questions about the procedures completed in 2019. A description of the information gathered is set out below.

Species of animal

2.   The majority of the tables refer to experimental procedures with the exception of tables 1a and 2, which refer to animals used for the first time, and tables 8 to 10, which refer to genetically altered animals created/bred in 2019 but not used in further experimental procedures.

3.   The list of species of categories of animals is selective to avoid undue complications; where collective terms are used it is because previous experience suggests that the category will contain a relatively small number or because further breakdown is of little interest. In several tables, rows which are completely zero have been omitted and if an animal is not mentioned then it is because the rows pertaining to that species are completely blank.

Genetic status of animal

4.   For genetically altered animals, separate breakdowns on genetically modified animals and animals with a harmful genetic mutation are no longer collected. Instead, separate breakdowns are now collected on animals which show a harmful phenotype (i.e. a harmful physical or biochemical defect) and animals which do not show a harmful phenotype.

5.   Since 2014, genetic status is shown separately for experimental procedures (Table 4) and those involving the creation/breeding of genetically altered animals that were not used in further experimental procedures (Tables 8 to 10).

Primary purpose

6.   Use of animals for regulated procedures is limited by Section 5 (3) of the Act to one of the following primary purposes:

   a.   **basic research:**

   b.   **translational or applied research** with one of the following aims—

      i.   the avoidance, prevention, diagnosis or treatment of disease, ill-health or other abnormality, or their effects, in man, animals or plants;

      ii.   the assessment, detection, regulation or modification of physiological conditions in man, animals or plants; or

      iii.   the improvement of the welfare of animals or of the production conditions for animals reared for agricultural purposes.

   c.   the **development, manufacture or testing** of the quality, effectiveness and safety of drugs, foodstuffs and feed-stuffs or any other substances or products, with one of the aims mentioned in paragraph (b);

   d.   **protection of the natural environment:** research in the interests of the health or welfare of man or animals;

   e.   **preservation of species**: research aimed at preserving the species of animal subjected to regulated procedures as part of the programme of work;

f.   **higher education or training** for the acquisition, maintenance or improvement of vocational skills;

g.   **forensic inquiries:** including tests as part of forensic investigations and the production of materials, for example, antisera, for use in forensic investigations;

Place of Birth (Table 2)

7.   From 2013, Schedule 2c and 25(e) of the Act require, unless a specific exemption is granted, that certain animals, listed in Schedule 2 to the Act, have to be specifically bred for the use in regulated procedures. The species so listed are: mouse, rat, guinea-pig, hamster, rabbit, dog, cat, primate, quail, ferret, gerbil, frog, zebra fish and pigs and sheep if genetically modified.

8.   Information is collected on place of birth. Statistics relate to animals used for the first time rather than on the number of procedures. The place of birth of these animals is tabulated according to whether it is within the UK, within the remainder of the EU, or elsewhere.

Stage of Development

9.   Details of procedures on immature forms were collected but not enumerated because it is impracticable in some cases to count such procedures, e.g. a foetus resorbed during gestation, or fish fry which are very small and fast-moving.

Severity (Tables 3 & Tables 8-10)

10.   Details of actual severity are recorded for all procedures.

11.   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 as follows.

* Sub-threshold: When a procedure was authorised under a project licence but did not actually cause suffering above the threshold of regulation (ASPA 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.

12.   The severity of genetically altered animals 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 for genotyping, the biopsy procedures will generally be assessed as mild;

- the animals assessed as severe in this category are expected to be 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 or viral vectors (i.e. viruses containing the genes of interest).

13. Full details of severity assessment and classification can be found in Annex 8 of the European Directive 2010/63/EU.

Type of procedure

14. Table 5 provides a breakdown of all experimental procedures undertaken for the primary purpose of basic research, by area of study. These are:

- 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
- Multi-systemic
- Ethology/animal behaviour/animal biology
- Other

15. Table 6 provides a breakdown of experimental procedures undertaken for the primary purpose of translation/applied research by area of study. These are:

- 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 disorders (skin, eyes and ears)
- Human endocrine system/metabolism disorders
- Other human disorders
- Animal diseases and disorders

- Animal welfare
- Diagnosis of diseases
- Plant diseases
- Non regulatory toxicology and ecotoxicology

16.   Table 7.1 provides a breakdown of experimental procedures undertaken for regulatory purposes. These fall into 4 categories:

- Routine production of blood based products, monoclonal antibodies(ascites) or other products;
- Quality control;
- Other efficacy and tolerance testing;
- Toxicity and other safety testing including pharmacology.

17.   Table 7.4 provides a further breakdown on toxicity and other safety testing, by the various testing methods used.

Legislative requirements (Table 7.2 and 7.3)

18.   Tables 7.2 provides a breakdown of all regulatory procedures by type of legislative requirement. Table 7.3 documents the origin of the requirement. The following are examples of legislative requirements which may be included:

- Medicines Act 1968;
- Legislation on medicinal products for veterinary use and their severity;
- Workplace safety – e.g. Health and Safety at Work (Northern Ireland) Order 1978, COSHH Regulations;
- Substances used in agriculture – e.g. Control of Pesticides Regulations (Northern Ireland) 1987; EU Pesticides Directives;
- Substances used in foodstuffs – e.g. The Food Safety (Northern Ireland) Order 1991.

Creation/breeding of genetically altered animals (Tables 1, 8-10)

19.   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 which were bred with the intention of producing genetically altered animals, but resulted in non-genetically altered animals being born.

Projects, project licence holders and licensed establishments (Table 11)

20.   Project licence holders have been classified according to the type of designated place which was their main place of employment at the end of the year, although they could be licensed to carry out procedures at more than one place. Procedures have been classified according to the type of designated place of the project licence holder reporting them.

Commentary

The main features of the statistics for 2019 were:

a. The number of procedures completed was 28,171. Of these 5953 (21%) related to the creation/breeding of genetically altered animals that were not used in further procedures and the remaining 22,218 (79%) were experimental procedures (Table 1).

b. The number of animals used for the first time was 27,850.This is in comparison to 28,012 in 2018 (Table 1a).

c. Of the 22,218 experimental procedures completed in 2019, the majority involved mice (80% or 17,730 procedures). Fish (other than Zebrafish); Domestic Fowl; and Cattle, each accounted for approximately 4% of the total experimental procedures (983, 820 and 814 procedures respectively). Sheep and Rats each accounted for 3% of procedures. The remaining procedures were carried out on other mammals and amphibians (Table 1).

d. In 2019, 97% of animals used for the first time in experimental procedures were born at establishments within the UK (21,266 animals). Most of the remaining 3% (541 animals) were born in the EU, whereas a small number were born elsewhere in the world (Table 2).

e. The majority of experimental procedures completed in 2019 used animals that had not been genetically modified (74.2% or 16,479 procedures). 21.3% (4,742 procedures) involved genetically modified animals without a harmful phenotype, i.e. a harmful physical or chemical defect and 4.5% (997 procedures) involved genetically modified animals with a harmful phenotype (Table 4).

f. Of the severity assessments undertaken for the 22,218 experimental procedures completed in 2019: 7% were assessed as sub-threshold; 32.1% were assessed as mild; 57.9% were assessed as moderate; 2.1% were assessed as severe and 0.9% were non-recovery (Table 3).

g. Of the 28,171 total procedures carried out in 2019: the majority, 51.2% (14,421) were undertaken for basic research; 20.6% (5,797) were undertaken for translational/applied research; 5% (1,395) related to protection of the natural environment; 2% (568) were undertaken for regulatory purposes; and 0.1% (33) were undertaken for forensic enquiries (Table 1).

h. In 2019, 14,421 procedures were undertaken for basic research purposes. Of these, the majority, 97.3% (14,037 procedures) were undertaken for the study of oncology and specified or multi-organ systems. The remaining 2.7% (384 procedures) were undertaken for the study of animal biology (including ethology/animal behaviour) or other purposes (Table 5).

i. In 2019, 5,797 procedures were undertaken for translational/applied research purposes. Of those 84% (4,868 procedures) were undertaken for research relating to human cancer and other disorders. Procedures relating to research into animal diseases and welfare amounted to 11.1% (645 procedures). The remaining 4.9% (284 procedures) were undertaken for the diagnosis of diseases (Table 6).

j. In 2019, 568 experimental procedures were undertaken for regulatory purposes. The majority of these, 75% (424 procedures) were for toxicity and other safety testing, including pharmacology. The remainder were for the routine production of blood based products and other efficiency and tolerance testing (Table 7.1).

k. Of the 568 experimental procedures undertaken for regulatory purposes, most were carried out to satisfy legislation on medicinal products for veterinary use (and their residues), 90.8% or 516 procedures. The remaining 9.2 % (52 procedures) were for food legislation, including legislation on food contact material (Table 7.2). All legislation was to satisfy EU requirements (Table 7.3).

l. Of the 5,953 procedures which related to the creation and breeding of genetically altered animals (not used in further experimental procedures), 90% (5,338 procedures) were for the maintenance of established lines of genetically modified animals. The remaining 10% (615 procedures) related to the creation of new lines of genetically modified animals. (Table 8).

m. Most procedures undertaken in 2019 (18,820 or 66.8%) were carried out in universities/ medical schools. Commercial organisations accounted for 6,438 of the total procedures (22.9%); and non-profit making organisations, 2,885 procedures (10.2%). The rest were carried out by government departments, 28 procedures (0.1%) (Table 11).

n. Returns were completed in respect of 121 project licences in 2019 (15 more than 2018). Of these, 73 licences reported having carried out countable procedures in 2019 (Table 11).

o. During 2019, the number of personal licences which were operational and authorised to carry out regulated procedures under the act was 591 (Table 12).

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

Northern Ireland 2019

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*)	13,359	4,367	0	4	0	0	0	17,730	5,751	23,481	83.4
Rat (*Rattus norvegicus*)	235	483	0	0	0	0	0	718	202	920	3.3
Guinea-pig (*Cavia porcellus*)	3	0	0	0	0	0	0	3	0	3	0.0
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	0	0	0	0	0	0	0	0	0.0
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	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	2	0	0	0	0	0	0	2	0	2	0.0
Cat (*Felis catus*)	0	0	0	0	0	0	21	21	0	21	0.1
Beagle (*Canis lupus familiaris*)	0	0	0	0	0	0	28	28	0	28	0.1
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*)	1	0	0	0	0	0	0	1	0	1	0.0
Horse and other equid (*Equidae*)	0	0	0	0	0	0	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	0	167	0	0	0	0	116	283	0	283	1.0
Goat (*Capra aegagrus hircus*)	0	0	0	0	0	0	30	30	0	30	0.1
Sheep (*Ovis aries*)	263	269	0	0	0	33	171	736	0	736	2.6
Cattle (*Bos primigenius*)	492	126	0	0	0	0	202	820	0	820	2.9
Primate											
New World monkey											
Marmoset and tamarin	0	0	0	0	0	0	0	0	0	0	0.0
Squirrel Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Other New World Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Old World monkey											
Prosimians	0	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0	0	0	0	0	0	0.0
Vervets	0	0	0	0	0	0	0	0	0	0	0.0
Baboons	0	0	0	0	0	0	0	0	0	0	0.0
Apes	0	0	0	0	0	0	0	0	0	0	0.0
Other Old World Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Other mammal (*other Mammalia*)	0	15	28	0	0	0	0	43	0	43	0.2
Bird											
Domestic fowl (*Gallus domesticus*)	66	274	474	0	0	0	0	814	0	814	2.9
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	0	0	0	0.0
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	6	0	0	0	0	0	6	0	6	0.0
Fish											
Zebrafish (*Danio rerio*)	0	0	0	0	0	0	0	0	0	0	0.0
Other fish (*other Pisces*)	0	90	893	0	0	0	0	983	0	983	3.5
Cephalopod (*Cephalopoda***)**	0	0	0	0	0	0	0	0	0	0	0.0
Total	14,421	5,797	1,395	4	0	33	568	22,218	5,953	28,171	100.0
% of total	51.2	20.6	5.0	0.0	0.0	0.1	2.0	78.9	21.1	100.0	

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

Northern Ireland 2019

Species of animal	Experimental purpose of procedure (*excluding creation & breeding*)							Total animals used for the first time in experimental procedures	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				
Mammal											
Mouse (*Mus musculus*)	13,359	4,367	0	4	0	0	0	17,730	5,751	23,481	84.3
Rat (*Rattus norvegicus*)	235	483	0	0	0	0	0	718	202	920	3.3
Guinea-pig (*Cavia porcellus*)	3	0	0	0	0	0	0	3	0	3	0.0
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	0	0	0	0	0	0	0	0	0.0
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	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	2	0	0	0	0	0	0	2	0	2	0.0
Cat (*Felis catus*)	0	0	0	0	0	0	0	0	0	0	0.0
Beagle (*Canis lupus familiaris*)	0	0	0	0	0	0	0	0	0	0	0.0
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*)	1	0	0	0	0	0	0	1	0	1	0.0
Horse and other equid (*Equidae*)	0	0	0	0	0	0	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	0	167	0	0	0	0	116	283	0	283	1.0
Goat (*Capra aegagrus hircus*)	0	0	0	0	0	0	25	25	0	25	0.1
Sheep (*Ovis aries*)	263	269	0	0	0	33	166	731	0	731	2.6
Cattle (*Bos primigenius*)	354	20	0	0	0	0	190	564	0	564	2.0
Primate											
New World monkey											
Marmoset and tamarin	0	0	0	0	0	0	0	0	0	0	0.0
Squirrel Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Other New World Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Old World monkey											
Prosimians	0	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0	0	0	0	0	0	0.0
Vervets	0	0	0	0	0	0	0	0	0	0	0.0
Baboons	0	0	0	0	0	0	0	0	0	0	0.0
Apes	0	0	0	0	0	0	0	0	0	0	0.0
Other Old World Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Other mammal (*other Mammalia*)	0	15	28	0	0	0	0	43	0	43	0.2
Bird											
Domestic fowl (*Gallus domesticus*)	66	274	474	0	0	0	0	814	0	814	2.9
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	0	0	0	0.0
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	0	0	0.0
Other fish (*other Pisces*)	0	90	893	0	0	0	0	983	0	983	3.5
Cephalopod (*Cephalopoda*)	0	0	0	0	0	0	0	0	0	0	0.0
Total	14,283	5,685	1,395	4	0	33	497	21,897	5,953	27,850	100.0
% of total	51.3	20.4	5.0	0.0	0.0	0.1	1.8	78.6	21.4	100.0	

Table 2 Place of birth of animals used for the first time in experimental procedures by species of animal (excludes non-human primates)

Northern Ireland 2019

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*)*	17,584	0	146	0	0	0	17,730	81.0
Rat (*Rattus norvegicus*)*	383	0	335	0	0	0	718	3.3
Guinea-pig (*Cavia porcellus*)*	3	0	0	0	0	0	3	0.0
Hamster (Syrian) (*Mesocricetus auratus*)*	0	0	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	0	0	0	0	0	0	0.0
Other rodent (*other Rodentia*)	0	0	0	0	0	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	2	0	0	0	0	0	2	0.0
Cat (*Felis catus*)	0	0	0	0	0	0	0	0.0
Beagle (*Canis lupus familiaris*)	0	0	0	0	0	0	0	0.0
Other dog (*other Canis*)	0	0	0	0	0	0	0	0.0
Ferret (*Mustela putorius furo*)	0	0	0	0	0	0	0	0.0
Other carnivore (*other Carnivora*)	0	1	0	0	0	0	1	0.0
Horse and other equid (*Equidae*)	0	0	0	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	171	112	0	0	0	0	283	1.3
Goat (*Capra aegagrus hircus*)	0	25	0	0	0	0	25	0.1
Sheep (*Ovis aries*)	143	528	60	0	0	0	731	3.3
Cattle (*Bos primigenius*)	336	228	0	0	0	0	564	2.6
Other mammal (*other Mammalia*)	0	43	0	0	0	0	43	0.2
Bird								
Domestic fowl (*Gallus domesticus*)	274	540	0	0	0	0	814	3.7
Quail (*Coturnix coturnix*)	0	0	0	0	0	0	0	0.0
Other bird (*other Aves*)	0	0	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	0	0	0	0	0	0	0.0
Other fish (*other Pisces*)	0	893	0	0	0	90	983	4.5
Cephalopod (*Cephalopoda*)	0	0	0	0	0	0	0	0.0
Total	18,896	2,370	541	0	0	90	21,897	100.0
% of total	86.3	10.8	2.5	0.0	0.0	0.4	100.0	

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

Table 3 Experimental procedures by species of animal, severity and purpose of the procedure, page 1 of 2

Northern Ireland 2019

Species of animal	Actual Severity	Experimental purpose of procedure							Total	% of species total
		Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries	Regulatory		
Mouse (*Mus musculus*)	Sub threshold	1,145	0	0	0	0	0	0	1,145	6.5
	Non-recovery	87	30	0	0	0	0	0	117	0.7
	Mild	3,198	829	0	2	0	0	0	4,029	22.7
	Moderate	8,761	3,325	0	2	0	0	0	12,088	68.2
	Severe	168	183	0	0	0	0	0	351	2.0
	Total	**13,359**	**4,367**	**0**	**4**	**0**	**0**	**0**	**17,730**	**100.0**
Rat (*Rattus norvegicus*)	Sub threshold	0	0	0	0	0	0	0	0	0.0
	Non-recovery	2	6	0	0	0	0	0	8	1.1
	Mild	27	112	0	0	0	0	0	139	19.4
	Moderate	198	364	0	0	0	0	0	562	78.3
	Severe	8	1	0	0	0	0	0	9	1.3
	Total	**235**	**483**	**0**	**0**	**0**	**0**	**0**	**718**	**100.0**
Guinea-pig (*Cavia porcellus*)	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	3	0	0	0	0	0	0	3	100.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**100.0**
Other rodent[1]	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	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Rabbit (*Oryctolagus cuniculus*)	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	2	0	0	0	0	0	0	2	100.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**100.0**
Cat (*Felis catus*)	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	0	0	0	0	0	0	21	21	100.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**21**	**100.0**
Dog[2]	Sub threshold	0	0	0	0	0	0	4	4	14.3
	Non-recovery	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	24	24	85.7
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**28**	**28**	**100.0**

Northern Ireland 2019

Species of animal	Actual Severity	Experimental purpose of procedure							Total	% of species total
		Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries	Regulatory		
Ferret (*Mustela putorius furo*)	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	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Horse and other equid (*Equidae*)	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	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Pig (*Sus scrofa domesticus*)	Sub threshold	0	0	0	0	0	0	0	0	0.0
	Non-recovery	0	12	0	0	0	0	0	12	4.2
	Mild	0	56	0	0	0	0	116	172	60.8
	Moderate	0	69	0	0	0	0	0	69	24.4
	Severe	0	30	0	0	0	0	0	30	10.6
	Total	**0**	**167**	**0**	**0**	**0**	**0**	**116**	**283**	**100.0**
Other ungulate[3]	Sub threshold	0	0	0	0	0	0	16	16	1.0
	Non-recovery	0	0	0	0	0	0	0	0	0.0
	Mild	695	395	0	0	0	33	387	1,510	95.2
	Moderate	60	0	0	0	0	0	0	60	3.8
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**755**	**395**	**0**	**0**	**0**	**33**	**403**	**1,586**	**100.0**
Other mammal (*other Mammalia*)	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	1	15	28	0	0	0	0	44	100.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
	Total	**1**	**15**	**28**	**0**	**0**	**0**	**0**	**44**	**100.0**

Table 3 Experimental procedures by species of animal, severity and purpose of the procedure, page 2 of 2

Northern Ireland 2019

Species of animal	Severity	Experimental purpose of procedure							Total	% of species total
		Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries	Regulatory		
Primate	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	0	0	0	0	0	0	0	**0**	**0.0**
	Moderate	0	0	0	0	0	0	0	**0**	**0.0**
	Severe	0	0	0	0	0	0	0	**0**	**0.0**
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Bird	Sub threshold	0	0	400	0	0	0	0	**400**	**49.1**
	Non-recovery	66	0	0	0	0	0	0	**66**	**8.1**
	Mild	0	191	0	0	0	0	0	**191**	**23.5**
	Moderate	0	79	10	0	0	0	0	**89**	**10.9**
	Severe	0	4	64	0	0	0	0	**68**	**8.4**
	Total	**66**	**274**	**474**	**0**	**0**	**0**	**0**	**814**	**100.0**
Reptile	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	0	0	0	0	0	0	0	**0**	**0.0**
	Moderate	0	0	0	0	0	0	0	**0**	**0.0**
	Severe	0	0	0	0	0	0	0	**0**	**0.0**
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Amphibian	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	0	6	0	0	0	0	0	**6**	**100.0**
	Moderate	0	0	0	0	0	0	0	**0**	**0.0**
	Severe	0	0	0	0	0	0	0	**0**	**0.0**
	Total	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**6**	**100.0**
Fish	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	0	90	893	0	0	0	0	**983**	**100.0**
	Moderate	0	0	0	0	0	0	0	**0**	**0.0**
	Severe	0	0	0	0	0	0	0	**0**	**0.0**
	Total	**0**	**90**	**893**	**0**	**0**	**0**	**0**	**983**	**100.0**
Cephalopods	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	0	0	0	0	0	0	0	**0**	**0.0**
	Moderate	0	0	0	0	0	0	0	**0**	**0.0**
	Severe	0	0	0	0	0	0	0	**0**	**0.0**
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
All species	Sub threshold	1,145	0	400	0	0	0	20	**1,565**	**7.0**
	Non-recovery	155	48	0	0	0	0	0	**203**	**0.9**
	Mild	3,926	1,694	921	2	0	33	548	**7,124**	**32.1**
	Moderate	9,019	3,837	10	2	0	0	0	**12,868**	**57.9**
	Severe	176	218	64	0	0	0	0	**458**	**2.1**
	Total	**14,421**	**5,797**	**1,395**	**4**	**0**	**33**	**568**	**22,218**	**100.0**

1. "Other rodent" includes Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetulus griseus*), Mongolian gerbil (*Meriones unguiculatus*), and other rodents (*other Rodentia*).

2. "Dog" includes beagles (*Canis lupus familiaris*) and other dogs (*other Canis*).

3. "Other ungulate" includes goat (*Capra aegagrus hircus*), sheep (*Ovis aries*), and cattle (*Bos primigenius*).

Table 4 Experimental procedures by species of animal and genetic status

Northern Ireland 2019

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*)	11,997	4,736	997	17,730	79.8
Rat (*Rattus norvegicus*)	712	6	0	718	3.2
Guinea-pig (*Cavia porcellus*)	3	0	0	3	0.0
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	0	0	0.0
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	0	0.0
Mongolian Gerbil (*Meriones unguiculatus*)	0	0	0	0	0.0
Other rodent (*other Rodentia*)	0	0	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	2	0	0	2	0.0
Cat (*Felis catus*)	21	0	0	21	0.1
Beagle (*Canis lupus familiaris*)	28	0	0	28	0.1
Other dog (*other Canis*)	0	0	0	0	0.0
Ferret (*Mustela putorius furo*)	0	0	0	0	0.0
Other carnivore (*other Carnivora*)	1	0	0	1	0.0
Horse and other equid (*Equidae*)	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	283	0	0	283	1.3
Goat (*Capra aegagrus hircus*)	30	0	0	30	0.1
Sheep (*Ovis aries*)	736	0	0	736	3.3
Cattle (*Bos primigenius*)	820	0	0	820	3.7
Primate					
New World monkey					
Marmoset and tamarin	0	0	0	0	0.0
Squirrel Monkey	0	0	0	0	0.0
Other New World Monkey	0	0	0	0	0.0
Old World monkey					
Prosimians	0	0	0	0	0.0
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0.0
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0.0
Vervets	0	0	0	0	0.0
Baboons	0	0	0	0	0.0
Apes	0	0	0	0	0.0
Other Old World Monkey	0	0	0	0	0.0
Other mammal (*other Mammalia*)	43	0	0	43	0.2
Bird					
Domestic fowl (*Gallus domesticus*)	814	0	0	814	3.7
Quail (*Coturnix coturnix*)	0	0	0	0	0.0
Other bird (*other Aves*)	0	0	0	0	0.0
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*)	6	0	0	6	0.0
Fish					
Zebrafish (*Danio rerio*)	0	0	0	0	0.0
Other fish (*other Pisces*)	983	0	0	983	4.4
Cephalopod (*Cephalopoda***)**	0	0	0	0	0.0
Total	16,479	4,742	997	22,218	100.0
% of total	74.2	21.3	4.5	100.0	

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

Northern Ireland 2019

Species of animal	Basic Research													Total	% of total
	Oncology	Cardio-vascular Blood and Lymphatic System	Nervous System	Respiratory System	Gastro-intestinal System including Liver	Musculo-skeletal System	Immune System	Urogenital/Reproduc-tive System	Sensory Organs (*skin, eyes and ears*)	Endocrine System/Metabolism	Multisys-temic	Ethology/Animal Behaviour/Animal Biology	Other		
Mammal															
Mouse (*Mus musculus*)	7,667	158	1,611	120	359	0	734	51	1,808	837	0	0	14	13,359	92.6
Rat (*Rattus norvegicus*)	61	0	0	42	0	0	0	0	76	56	0	0	0	235	1.6
Guinea-pig (*Cavia porcellus*)	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0.0
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other rodent (*other Rodentia*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0.0
Cat (*Felis catus*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Beagle (*Canis lupus familiaris*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other dog (*other Canis*)	0	0	0	0	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	0	0	0.0
Other carnivore (*other Carnivora*)	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.0
Horse and other equid (*Equidae*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Goat (*Capra aegagrus hircus*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Sheep (*Ovis aries*)	0	0	0	0	0	0	0	0	0	0	0	263	0	263	1.8
Cattle (*Bos primigenius*)	0	0	0	18	0	0	268	0	0	0	166	40	0	492	3.4
Primate															
New World monkey															
Marmoset and tamarin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Squirrel Monkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other New World Monkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Old World monkey															
Prosimians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Vervets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Baboons	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Apes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other Old World Monkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other mammal (*other Mammalia*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Bird															
Domestic fowl (*Gallus domesticus*)	0	0	0	0	0	0	0	0	0	0	0	0	66	66	0.5
Quail (*Coturnix coturnix*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other bird (*other Aves*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
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	0	0	0	0.0
Xenopus (*laevis and tropicalis*)	0	0	0	0	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	0	0	0.0
Fish															
Zebrafish (*Danio rerio*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other fish (*other Pisces*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cephalopod (*Cephalopoda*)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	7,728	158	1,611	180	359	0	1,004	51	1,884	896	166	304	80	14,421	100.0
% of total	53.6	1.1	11.2	1.2	2.5	0.0	7.0	0.4	13.1	6.2	1.2	2.1	0.6	100.0	

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

Northern Ireland 2019

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*)	754	1,269	9	20	1,088	0	476	0	0
Rat (*Rattus norvegicus*)	0	112	0	0	0	0	0	347	0
Guinea-pig (*Cavia porcellus*)	0	0	0	0	0	0	0	0	0
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	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	0	0	0	0	0	0	0	0
Other rodent (*other Rodentia*)	0	0	0	0	0	0	0	0	0
Rabbit (*Oryctolagus cuniculus*)	0	0	0	0	0	0	0	0	0
Cat (*Felis catus*)	0	0	0	0	0	0	0	0	0
Beagle (*Canis lupus familiaris*)	0	0	0	0	0	0	0	0	0
Other dog (*other Canis*)	0	0	0	0	0	0	0	0	0
Ferret (*Mustela putorius furo*)	0	0	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	12	0	0	0	0	0	0
Goat (*Capra aegagrus hircus*)	0	0	0	0	0	0	0	0	0
Sheep (*Ovis aries*)	0	0	0	0	0	0	0	0	0
Cattle (*Bos primigenius*)	0	0	0	0	0	0	0	0	0
Primate									
New World monkey									
Marmoset and tamarin	0	0	0	0	0	0	0	0	0
Squirrel Monkey	0	0	0	0	0	0	0	0	0
Other New World Monkey	0	0	0	0	0	0	0	0	0
Old World monkey									
Prosimians	0	0	0	0	0	0	0	0	0
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0	0	0	0	0
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0	0	0	0	0
Vervets	0	0	0	0	0	0	0	0	0
Baboons	0	0	0	0	0	0	0	0	0
Apes	0	0	0	0	0	0	0	0	0
Other Old World Monkey	0	0	0	0	0	0	0	0	0
Other mammal (*other Mammalia*)	0	0	0	0	0	0	0	**0**	**0**
Bird									
Domestic fowl (*Gallus domesticus*)	0	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	0	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	0	0	0	0	0	0	**0**	**0**
Other fish (*other Pisces*)	0	0	0	0	0	0	0	**0**	**0**
Cephalopod (*Cephalopoda*)	0	0	0	0	0	0	0	**0**	**0**
Total	**754**	**1,381**	**21**	**20**	**1,088**	**0**	**476**	**347**	**0**
% of total	**13.0**	**23.8**	**0.4**	**0.3**	**18.8**	**0.0**	**8.2**	**6.0**	**0.0**

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

Northern Ireland 2019

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*)	723	0	28	0	0	0	0	0	4,367	75.3
Rat (*Rattus norvegicus*)	24	0	0	0	0	0	0	0	483	8.3
Guinea-pig (*Cavia porcellus*)	0	0	0	0	0	0	0	0	0	0.0
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	0	0	0	0	0	0	0	0.0
Hamster (Chinese) (*Cricetulus griseus*)	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
Other rodent (*other Rodentia*)	0	0	0	0	0	0	0	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	0	0	0	0	0	0	0	0	0	0.0
Cat (*Felis catus*)	0	0	0	0	0	0	0	0	0	0.0
Beagle (*Canis lupus familiaris*)	0	0	0	0	0	0	0	0	0	0.0
Other dog (*other Canis*)	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
Other carnivore (*other Carnivora*)	0	0	0	0	0	0	0	0	0	0.0
Horse and other equid (*Equidae*)	0	0	0	0	0	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	0	0	0	69	86	0	0	0	167	2.9
Goat (*Capra aegagrus hircus*)	0	0	0	0	0	0	0	0	0	0.0
Sheep (*Ovis aries*)	0	0	0	0	0	269	0	0	269	4.6
Cattle (*Bos primigenius*)	0	0	0	126	0	0	0	0	126	2.2
Primate										
New World monkey										
Marmoset and tamarin	0	0	0	0	0	0	0	0	0	0.0
Squirrel Monkey	0	0	0	0	0	0	0	0	0	0.0
Other New World Monkey	0	0	0	0	0	0	0	0	0	0.0
Old World monkey										
Prosimians	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0	0	0	0	0	0.0
Vervets	0	0	0	0	0	0	0	0	0	0.0
Baboons	0	0	0	0	0	0	0	0	0	0.0
Apes	0	0	0	0	0	0	0	0	0	0.0
Other Old World Monkey	0	0	0	0	0	0	0	0	0	0.0
Other mammal (*other Mammalia*)	0	0	0	0	0	15	0	0	15	0.3
Bird										
Domestic fowl (*Gallus domesticus*)	0	0	0	274	0	0	0	0	274	4.7
Quail (*Coturnix coturnix*)	0	0	0	0	0	0	0	0	0	0.0
Other bird (*other Aves*)	0	0	0	0	0	0	0	0	0	0.0
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	6	0	0	0	0	0	6	0.1
Fish										
Zebrafish (*Danio rerio*)	0	0	0	0	0	0	0	0	0	0.0
Other fish (*other Pisces*)	0	0	0	0	90	0	0	0	90	1.6
Cephalopod (*Cephalopoda*)	0	0	0	0	0	0	0	0	0	0.0
Total	747	0	34	469	176	284	0	0	5,797	100.0
% of total	12.9	0.0	0.6	8.1	3.0	4.9	0.0	0.0	100.0	

Table 7.1 Experimental procedures by species of animal: regulatory use

Northern Ireland 2019

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*)	0	0	0	0	0	0	0	0	0	0	0.0
Rat (*Rattus norvegicus*)	0	0	0	0	0	0	0	0	0	0	0.0
Guinea-pig (*Cavia porcellus*)	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	0	0	0	0	0	0	0	0	0.0
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	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	0	0	0	0	0	0	0	0	0	0	0.0
Cat (*Felis catus*)	21	0	0	0	0	0	0	0	0	21	3.7
Beagle (*Canis lupus familiaris*)	0	0	0	0	0	0	0	0	28	28	4.9
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*)	0	0	0	0	0	0	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	0	0	0	0	0	0	0	0	116	116	20.4
Goat (*Capra aegagrus hircus*)	0	0	0	0	0	0	0	0	30	30	5.3
Sheep (*Ovis aries*)	27	0	0	0	0	0	0	0	144	171	30.1
Cattle (*Bos primigenius*)	0	0	0	0	0	0	0	96	106	202	35.6
Primate											
New World monkey											
Marmoset and tamarin	0	0	0	0	0	0	0	0	0	0	0.0
Squirrel Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Other New World Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Old World monkey											
Prosimians	0	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0	0	0	0	0	0	0.0
Vervets	0	0	0	0	0	0	0	0	0	0	0.0
Baboons	0	0	0	0	0	0	0	0	0	0	0.0
Apes	0	0	0	0	0	0	0	0	0	0	0.0
Other Old World Monkey	0	0	0	0	0	0	0	0	0	0	0.0
Other mammal (*other Mammalia*)	0	0	0	0	0	0	0	0	0	0	0.0
Bird											
Domestic fowl (*Gallus domesticus*)	0	0	0	0	0	0	0	0	0	0	0.0
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	0	0	0	0.0
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	0	0	0.0
Other fish (*other Pisces*)	0	0	0	0	0	0	0	0	0	0	0.0
Cephalopod (*Cephalopoda*)	0	0	0	0	0	0	0	0	0	0	0.0
Total	**48**	**0**	**0**	**0**	**0**	**0**	**0**	**96**	**424**	**568**	**100.0**
% of total	**8.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**16.9**	**74.6**	**100.0**	

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

Northern Ireland 2019

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 (*Mus musculus*)	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Rat (*Rattus norvegicus*)	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
All other rodent[1]	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Rabbit (*Oryctolagus cuniculus*)	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Cat (*Felis catus*)	0	21	0	0	0	0	0	0	0	0	**21**	**3.7**
Dog	0	28	0	0	0	0	0	0	0	0	**28**	**4.9**
Ferret (*Mustela putorius furo*)	0	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**	**0.0**
Horse and other equid (*Equidae*)	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Pig (*Sus scrofa domesticus*)	0	116	0	0	0	0	0	0	0	0	**116**	**20.4**
Other ungulate[2]	0	351	0	0	0	0	52	0	0	0	**403**	**71.0**
Primate												
New World monkey	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Old World monkey	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Other mammal (*other Mammalia*)	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**	**0.0**
Reptile, amphibian	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Fish	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Cephalopod	0	0	0	0	0	0	0	0	0	0	**0**	**0.0**
Total	**0**	**516**	**0**	**0**	**0**	**0**	**52**	**0**	**0**	**0**	**568**	**100.0**
% of total	**0.0**	**90.8**	**0.0**	**0.0**	**0.0**	**0.0**	**9.2**	**0.0**	**0.0**	**0.0**	**100.0**	

1. "All other rodent" includes guinea pig (*Cavia porcellus*), Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetulus griseus*), Mongolian gerbil (*Meriones unguiculatus*), and other rodents (*other Rodentia*).

2. "Other ungulate" includes goat (*Capra aegagrus hircus*), sheep (*Ovis aries*), and cattle (*Bos primigenius*).

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

Northern Ireland 2019

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*)	0	0	0	0	0.0
Rat (*Rattus norvegicus*)	0	0	0	0	0.0
Guinea-pig (*Cavia porcellus*)	0	0	0	0	0.0
Hamster (Syrian) (*Mesocricetus auratus*)	0	0	0	0	0.0
Hamster (Chinese) (*Cricetulus griseus*)	0	0	0	0	0.0
Mongolian Gerbil (*Meriones unguiculatus*)	0	0	0	0	0.0
Other rodent (*other Rodentia*)	0	0	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	0	0	0	0	0.0
Cat (*Felis catus*)	21	0	0	21	3.7
Beagle (*Canis lupus familiaris*)	28	0	0	28	4.9
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*)	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	116	0	0	116	20.4
Goat (*Capra aegagrus hircus*)	30	0	0	30	5.3
Sheep (*Ovis aries*)	171	0	0	171	30.1
Cattle (*Bos primigenius*)	202	0	0	202	35.6
Primate					
New World monkey					
Marmoset and tamarin	0	0	0	0	0.0
Squirrel Monkey	0	0	0	0	0.0
Other New World Monkey	0	0	0	0	0.0
Old World monkey					
Prosimians	0	0	0	0	0.0
Cynomolgus monkey (*Macaca fascicularis*)	0	0	0	0	0.0
Rhesus monkey (*Macaca mulatta*)	0	0	0	0	0.0
Vervets	0	0	0	0	0.0
Baboons	0	0	0	0	0.0
Apes	0	0	0	0	0.0
Other Old World Monkey	0	0	0	0	0.0
Other mammal (*other Mammalia***)**	0	0	0	0	0.0
Bird					
Domestic fowl (*Gallus domesticus*)	0	0	0	0	0.0
Quail (*Coturnix coturnix*)	0	0	0	0	0.0
Other bird (*other Aves*)	0	0	0	0	0.0
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*)	0	0	0	0	0.0
Other fish (*other Pisces*)	0	0	0	0	0.0
Cephalopod (*Cephalopoda***)**	0	0	0	0	0.0
Total	568	-	-	568	100.0
% of total	**100.0**	**0.0**	**0.0**	**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

Northern Ireland 2019

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 (*Mus musculus*)	0	0	0	0	0	0	0	0	0	0	0	0	0
Rat (*Rattus norvegicus*)	0	0	0	0	0	0	0	0	0	0	0	0	0
All other rodent[1]	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabbit (*Oryctolagus cuniculus*)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cat (*Felis catus*)	0	0	0	0	0	0	0	0	0	0	0	0	0
Dog	0	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	0
Other carnivore (*other Carnivora*)	0	0	0	0	0	0	0	0	0	0	0	0	0
Horse and other equid (*Equidae*)	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig (*Sus scrofa domesticus*)	0	0	0	0	0	0	0	0	0	0	0	4	0
Other ungulate[2]	0	0	0	0	0	0	0	0	0	0	0	74	0
Primate													
New World monkey	0	0	0	0	0	0	0	0	0	0	0	0	0
Old World monkey	0	0	0	0	0	0	0	0	0	0	0	0	0
Other mammal (*other Mammalia*)	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	0	0
Reptile, amphibian	0	0	0	0	0	0	0	0	0	0	0	0	0
Fish	0	0	0	0	0	0	0	0	0	0	0	0	0
Cephalopod	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**	**78**	**0**
% of total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**18.4**	**0.0**

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 2017

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 (*Mus musculus*)	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rat (*Rattus norvegicus*)	0	0	0	0	0	0	0	0	0	0	0	0	0.0
All other rodent[1]	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rabbit (*Oryctolagus cuniculus*)	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cat (*Felis catus*)	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dog	0	28	0	0	0	0	0	0	0	0	0	28	6.6
Ferret (*Mustela putorius furo*)	0	0	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	0.0
Horse and other equid (*Equidae*)	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Pig (*Sus scrofa domesticus*)	0	112	0	0	0	0	0	0	0	0	0	116	27.4
Other ungulate[2]	0	206	0	0	0	0	0	0	0	0	0	280	66.0
Primate													
New World monkey	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Old World monkey	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other mammal (*other Mammalia*)	0	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	0	0.0
Reptile, amphibian	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Fish	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cephalopod	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	**0**	**346**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**424**	**100.0**
% of total	**0.0**	**81.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**100.0**	

1. "All other rodent" includes guinea pig (*Cavia porcellus*), Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetulus griseus*), Mongolian gerbil (*Meriones unguiculatus*), and other rodents (*other Rodentia*).

2. "Other ungulate" includes goat (*Capra aegagrus hircus*), sheep (*Ovis aries*), and cattle (*Bos primigenius*).

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

Northern Ireland 2019

Species of animal	Actual severity	Genetic status			Total	% of species total
		Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Mouse (*Mus musculus*)	Sub threshold	16	2,615	16	**2,647**	**46.0**
	Non-recovery	0	0	0	**0**	**0.0**
	Mild	81	2,002	93	**2,176**	**37.8**
	Moderate	0	253	603	**856**	**14.9**
	Severe	0	64	8	**72**	**1.3**
	Total	**97**	**4,934**	**720**	**5,751**	**100.0**
Rat (*Rattus norvegicus*)	Sub threshold	0	202	0	**202**	**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**	**202**	**0**	**202**	**100.0**
Guinea-pig (*Cavia porcellus*)	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Other rodent[1]	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Rabbit (*Oryctolagus cuniculus*)	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Cat (*Felis catus*)	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Dog	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Ferret (*Mustela putorius furo*)	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Horse and other equid (*Equidae*)	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**

Species of animal	Actual severity	Genetic status			Total	% of species total
		Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Pig (*Sus scrofa domesticus*)	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Other ungulate[2]	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Other mammal[3]	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Primate	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Bird	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Reptile	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Amphibian	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Fish	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Cephalopod	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
All species	Sub threshold	16	2,817	16	**2,849**	**47.9**
	Non-recovery	0	0	0	**0**	**0.0**
	Mild	81	2,002	93	**2,176**	**36.6**
	Moderate	0	253	603	**856**	**14.4**
	Severe	0	64	8	**72**	**1.2**
	Total	**97**	**5,136**	**720**	**5,953**	**100.0**

1. "Other rodent" includes Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetulus griseus*), Mongolian gerbil (*Meriones unguiculatus*), and other rodents (*other Rodentia*).

2. "Other ungulate" includes goat (*Capra aegagrus hircus*), sheep (*Ovis aries*), and cattle (*Bos primigenius*).

3. "Other mammal" includes other carnivores (*other Carnivora*) and other mammals (*other Mammalia*).

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

Northern Ireland 2019

Species of animal	Actual severity	Basic research by genetic status			Translational/applied research			Total by genetic status			Total	% of species 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 (*Mus musculus*)	Sub threshold	0	309	0	0	0	0	0	309	0	309	50.2
	Non-recovery	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	40	0	0	11	0	0	51	0	51	8.3
	Moderate	0	0	0	0	249	0	0	249	0	249	40.5
	Severe	0	6	0	0	0	0	0	6	0	6	1.0
	Total	**0**	**355**	**0**	**0**	**260**	**0**	**0**	**615**	**0**	**615**	**100.0**
Rat (*Rattus norvegicus*)	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Guinea-pig (*Cavia porcellus*)	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Other rodent[1]	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Rabbit (*Oryctolagus cuniculus*)	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Cat (*Felis catus*)	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Dog	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Ferret (*Mustela putorius furo*)	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Horse and other equid (*Equidae*)	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Pig (*Sus scrofa domesticus*)	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**

Species of animal	Actual severity	Basic research by genetic status			Translational/applied research			Total by genetic status			Total	% of species 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		
Other ungulate[2]	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Other mammal[3]	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Primate	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Bird	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Reptile	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
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	0	0	0	0	0	0	0	0	**0**	**0.0**
	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Fish	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Cephalopod	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	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	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
All species	Sub threshold	0	309	0	0	0	0	0	309	0	**309**	**50.2**
	Non-recovery	0	0	0	0	0	0	0	0	0	**0**	**0.0**
	Mild	0	40	0	0	11	0	0	51	0	**51**	**8.3**
	Moderate	0	0	0	0	249	0	0	249	0	**249**	**40.5**
	Severe	0	6	0	0	0	0	0	6	0	**6**	**1.0**
	Total	**0**	**355**	**0**	**0**	**260**	**0**	**0**	**615**	**0**	**615**	**100.0**

1. "Other rodent" includes Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetulus griseus*), Mongolian gerbil (*Meriones unguiculatus*), and other rodents (*other Rodentia*).

2. "Other ungulate" includes goat (*Capra aegagrus hircus*), sheep (*Ovis aries*), and cattle (*Bos primigenius*).

3. "Other mammal" includes other carnivores (*other Carnivora*) and other mammals (*other Mammalia*).

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

Northern Ireland 2019

Species of animal	Actual severity	Basic Research													Total	% of species total
		Oncology	Cardio-vascular Blood and Lymphatic System	Nervous System	Respiratory System	Gastro-intestinal System including Liver	Musculo-skeletal System	Immune System	Urogenital/Reproductive System	Sensory Organs (*skin, eyes and ears*)	Endocrine System/Metabolism	Multisystemic	Ethology/Animal Behaviour/Animal Biology	Other		
Mouse (*Mus musculus*)	Sub threshold	0	0	309	0	0	0	0	0	0	0	0	0	0	309	87.0
	Non-recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	40	0	0	0	0	0	0	0	0	0	0	40	11.3
	Moderate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	6	0	0	0	0	0	0	0	0	0	0	6	1.7
	Total	**0**	**0**	**355**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**355**	**100.0**
Rat (*Rattus norvegicus*)	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Guinea-pig (*Cavia porcellus*)	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Other rodent[1]	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Rabbit (*Oryctolagus cuniculus*)	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Cat (*Felis catus*)	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Dog	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Ferret (*Mustela putorius furo*)	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Horse and other equid (*Equidae*)	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Pig (*Sus scrofa domesticus*)	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**

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Species of animal	Actual severity	Basic Research													Total	% of species total
		Oncology	Cardio-vascular Blood and Lymphatic System	Nervous System	Respiratory System	Gastro-intestinal System including Liver	Musculo-skeletal System	Immune System	Urogenital/ Reproduc-tive System	Sensory Organs (*skin, eyes and ears*)	Endocrine System/ Metabolism	Multisys-temic	Ethology/ Animal Behaviour /Animal Biology	Other		
Other ungulate[2]	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Other mammal[3]	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Primate	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Bird	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Reptile	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	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	0	0	0	0	0	0	0	0.0
Fish	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
Cephalopod	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	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**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**
All species	Sub threshold	0	0	309	0	0	0	0	0	0	0	0	0	0	309	87.0
	Non-recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	40	0	0	0	0	0	0	0	0	0	0	40	11.3
	Moderate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	6	0	0	0	0	0	0	0	0	0	0	6	1.7
	Total	**0**	**0**	**355**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**355**	**100.0**

1. "Other rodent" includes Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetulus griseus*), Mongolian gerbil (*Meriones unguiculatus*), and other rodents (*other Rodentia*).

2. "Other ungulate" includes goat (*Capra aegagrus hircus*), sheep (*Ovis aries*), and cattle (*Bos primigenius*).

3. "Other mammal" includes other carnivores (*other Carnivora*) and other mammals (*other Mammalia*).

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

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Species of animal	Actual severity	Human Cancer	Human Infectious Disorders	Human Cardiovascular Disorders	Human Nervous and Mental Disorders	Human Respiratory Disorders	Human Gastrointestinal Disorders including Liver	Human Musculo-skeletal 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
Mouse (*Mus musculus*)	Sub threshold	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
	Mild	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0	249	0	0	0	0	0	0	0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**260**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Rat (*Rattus norvegicus*)	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Guinea-pig (*Cavia porcellus*)	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Other rodent1	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabbit (*Oryctolagus cuniculus*)	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Cat (*Felis catus*)	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Dog	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Ferret (*Mustela putorius furo*)	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Horse and other equid (*Equidae*)	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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Species of animal	Actual severity	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 Musculo-skeletal 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
Pig (*Sus scrofa domesticus*)	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Other ungulate[2]	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Other mammal[3]	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Primates	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Bird	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Reptile	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Amphibian	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Fish	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Cephalopod	Sub threshold	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
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	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
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
All species	Sub threshold	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
	Mild	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0	249	0	0	0	0	0	0	0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**260**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

2. "Other ungulate" includes goat (*Capra aegagrus hircus*), sheep (*Ovis aries*), and cattle (*Bos primigenius*).

3. "Other mammal" includes other carnivores (*other Carnivora*) and other mammals (*other Mammalia*).

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

Northern Ireland 2019

Species of animal	Actual severity	Genetic status			Total	% of species total
		Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Mouse (*Mus musculus*)	Sub threshold	16	2,306	16	2,338	45.5
	Non-recovery	0	0	0	0	0.0
	Mild	81	1,951	93	2,125	41.4
	Moderate	0	4	603	607	11.8
	Severe	0	58	8	66	1.3
	Total	**97**	**4,319**	**720**	**5,136**	**100.0**
Rat (*Rattus norvegicus*)	Sub threshold	0	202	0	202	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**	**202**	**0**	**202**	**100.0**
Guinea-pig (*Cavia porcellus*)	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Other rodent[1]	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Rabbit (*Oryctolagus cuniculus*)	Sub threshold	0	0	0	0	0.0
	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	0	0	0	0.0
Cat (*Felis catus*)	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Dog	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Ferret (*Mustela putorius furo*)	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**
Horse and other equid (*Equidae*)	Sub threshold	0	0	0	0	0.0
	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**	**0**	**0**	**0**	**0.0**

Species of animal	Actual severity	Genetic status			Total	% of species total
		Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Pig (*Sus scrofa domesticus*)	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Other ungulate[2]	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Other mammal[3]	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Primate	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Bird	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Reptile	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Amphibian	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Fish	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
Cephalopod	Sub threshold	0	0	0	**0**	**0.0**
	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**	**0**	**0**	**0**	**0.0**
All species	Sub threshold	16	2,508	16	**2,540**	**47.6**
	Non-recovery	0	0	0	**0**	**0.0**
	Mild	81	1,951	93	**2,125**	**39.8**
	Moderate	0	4	603	**607**	**11.4**
	Severe	0	58	8	**66**	**1.2**
	Total	**97**	**4,521**	**720**	**5,338**	**100.0**

1. "Other rodent" includes Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetulus griseus*), Mongolian gerbil (*Meriones unguiculatus*), and other rodents (*other Rodentia*).

2. "Other ungulate" includes goat (*Capra aegagrus hircus*), sheep (*Ovis aries*), and cattle (*Bos primigenius*).

3. "Other mammal" includes other carnivores (*other Carnivora*) and other mammals (*other Mammalia*).

Table 11 Procedures and project licences by type of licensed establishment

Northern Ireland 2019

Type of licensed establishment[2]	Number of project licences where countable procedures were completed in 2019	Number of project licences where only non-countable1 procedures were completed in 2019	Number of project licences where no procedures were completed in 2019	Total number of project licences	Number of procedures	
					Total	% of total
Public health laboratories	0	0	0	0	0	0.0
Universities, medical schools	44	0	24	68	18,820	66.8
Government departments	1	0	3	4	28	0.1
Other public bodies	0	0	0	0	0	0.0
Non-profit-making organisations	20	0	16	36	2,885	10.2
Commercial organisations	8	0	5	13	6,438	22.9
Total	**73**	**0**	**48**	**121**	**28,171**	**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) are not 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 (0 returns in 2019).

Table 12 Designated establishments: 2009-2019

Number of designated places at 31 December 2019

Northern Ireland

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scientific procedure establishments	5	5	5	5	4	4	4	4	4	4	4
Scientific procedure and breeding establishments	0	0	0	0	0	0	0	0	0	1	1
Scientific procedure breeding and supplying establishments	3	3	3	3	4	4	4	4	5	4	4
Scientific procedure and supplying establishments	0	0	0	0	0	0	0	0	0	0	0
Breeding and supplying establishments	1	1	1	1	1	1	1	1	1	1	0
Total designated places	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**10**	**10**	**9**

Table 13 Personal Licensees:200-2019

Number of personal licences at 31 December 2019

Northern Ireland

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
565	585	582	590	480	480	548	630	669	598	591

Appendix

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

Introduction

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

Scope of the Act

2. The Act controls any experimental or other scientific procedure applied to a 'protected animal' which 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'. 'Protected animals' are defined as all living vertebrate animals, except man, plus cephalopods. The definition extends to foetal, larval or embryonic forms that have reached specified stages in their development. 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.

3. The definition of a regulated procedure encompasses most breeding of animals with genetic defects; production of antisera and other blood products; the maintenance and passage of tumours and parasites; and 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.

4. The controls of the 1986 Act do not extend to procedures applied to animals in the course of recognised veterinary, agricultural or animal husbandry practice; procedures for identification of animals for scientific purposes, if this causes no more than momentary pain or distress and no lasting harm; or clinical tests on animals for evaluating a veterinary product under authority of an Animal Test Certificate (issued under the Medicines Act 1968).

Project and Personal Licences

5. Two kinds of licence are required for all scientific work controlled by the 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. 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.

6. A project licence is granted when the Department of Health (hereinafter referred to as the Department) 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.

7. In deciding whether and on what terms to authorise the project, the likely adverse effects on the animals used must be weighed against the benefit (to humans, other animals or the environment) which is likely to accrue from the work. Adequate consideration must also have been given to the feasibility of using alternative methods not involving living animals. The holder of a project licence undertakes overall responsibility for the scientific direction and control of the work and is responsible for making the statistical returns on which this publication is based. New project licence applicants are required to complete an accredited training course.

8.   A personal licence is the Department'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 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 is issued.

Establishment Licences

9.   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; primates; ferrets; 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.

10. Licensed establishments are required to appoint the following named persons:

•   Named Animal Care and Welfare Office (NACWO)
•   Named Veterinary Surgeon (NVS)
•   Named Training and Competence Officer (NTCO)
•   Named Information Officer (NIO)
•   Named Compliance Officer (NCO)

The Inspectorate

11. The Act gives statutory recognition to the Animals (Scientific Procedures) Inspectorate and describes the Inspectors' duties. Inspectors hold either medical or veterinary qualifications. Inspectors assess all applications for new licences or amendments to existing licences in detail and advise the Department on how to ensure that only properly justified work is licensed. When assessing research proposals, the Inspectorate ensures that full consideration is given to alternatives, not only the **replacement** of procedures with others which do not use animals, but also the **reduction** of the number of animals used and the **refinement** of procedures to minimise pain and suffering. These are known as the **3Rs**. Inspectors carry out visits, mainly without notice, to establishments designated under the Act to inspect the premises and to ensure that the establishment's controls are adequate and that the terms and conditions of the licences issued under it are being observed.

12. Inspectors also advise the Department on policy matters connected with the operation of the Act and they are available to give advice and assistance to licensees and other personnel working under the Act.

13. During 2019 the Inspectorate carried out 22 inspections of licenced establishments.

The Animals in Science Committee (ASC)

14. The Animals in Science Committee is an advisory non-departmental public body of the Home Office. The Animals in Science Committee was established by the Animals (Scientific Procedures) Act 1986 as amended to comply with Directive EU 2010/63/EU which came in to force on the 1st January 2013. Article 49 of this Directive requires each EU country to set up a National Committee

for the Protection of Animals used for Scientific Purposes. In the UK the committee is known as the Animals in Science Committee and has superseded the Animal Procedures Committee.

The Animals in Science Committee is responsible for providing impartial, balanced and objective advice to the Home Office, the Department of Health to animal welfare bodies and within the European Union on issues relating to the Animals (Scientific Procedures) Act 1986 as amended.

Guidance, Codes of Practice and Statistics

15. In addition to these annual statistics, the Act requires that there be published and laid before Parliament guidance on the operation of the controls of the Act and codes of practice as to the care and accommodation of animals and their use in regulated procedures. Current Home Office publications include:

   • Guidance on the operation of the Animals (Scientific Procedures) Act 1986 (2014);

   • Working to reduce the use of animals in research (February 2014);

   • Code of practice for the housing and care of animals bred, supplied or used in scientific procedures (December 2014)

   • Household Products testing ban advice note (October 2015)

   • Use, keeping alive and reuse advice note (October 2015)

   • Rehoming and setting free of animals (October 2015)

   • Identification and Management of patters of low level concerns at licenced establishments (December 2015)

   • The Harm-Benefit Analysis Process (December 2015)

   • Guidance on the use of Human Materials in Animals (January 2016)

   • Working with animals taken from the wild (July 2016)

Education and training

16. The Animals (Scientific Procedures) Act 1986 imposes clear responsibilities on persons with specific roles in relation to the care and use of animals in scientific procedures. These are elaborated further in the Home Office guidance on the operation of the Act published in March 2014 https://www.gov.uk/government/publications/operation-of-aspa. As the roles differ, it follows that the education and training required before assuming these responsibilities will differ:

   • personal licence holders are responsible for the welfare of animals on which they carry out regulated procedures; applicants will be granted licences only if adequately trained to take on this responsibility and they will usually be required to work under supervision initially;

   • project licences will be issued only to persons with appropriate qualifications to direct a programme of work which is well-justified and takes account of all reasonable possibilities for reducing the number of animals used, refining the procedures to reduce suffering and replacing animal procedures with alternatives which do not involve protected animals;

   • holders of establishment licences have responsibility not only for ensuring that the fabric and staffing of designated places are maintained to appropriate standards but also for ensuring that reasonable steps are taken to prevent unauthorised procedures being carried out and that adequate training facilities are available for all animal users.

17. European Directive 2010/63/EU requires that staff are adequately trained to carry out procedures on animals; design procedures and projects; take care of or kill animals. All training programmes are accredited under a scheme recognised by the Department. Accreditation seeks to achieve common and high standards for licensee training.

Performance against code of practice standards

18. The licensing team works to specific targets set out in the draft Code of Practice. The Code of Practice requires new personal licences, certificates and amendments to be issued within 20 working days. Project licences will be considered and issued/refused within 40 working days from receipt of application, unless the application involves a complex or multidisciplinary programme in which case the process may be extended by a further 15 working days (3 weeks). In 2019, 3 project licences were not processed within the targets prescribed within the Code of Practice. All personal licences were processed within the targets prescribed within the Code of Practice.

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