



Department of  
**Health**

An Roinn Sláinte

Mánnystrie O Poustie

[www.health-ni.gov.uk](http://www.health-ni.gov.uk)

# Statistics of Scientific Procedures on Living Animals Northern Ireland 2021





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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

THE STATIONERY OFFICE



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# 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.

## **Covid-19 and animal procedures.**

The figures presented in this report relate to the number of scientific procedures on animals between 1 January and the 31 December 2021. In response to the Coronavirus Pandemic, there were restrictions imposed throughout all sectors of Northern Ireland which may have impacted on activity at establishments during this period. No extra data has been collected in relation to the effect of the pandemic on these establishments.

## **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>

Commission Implementing Decision 2020/569/EU replacing Decision 2012/707/EU

## Description of Statistical Tables

1. Project holders were asked to answer detailed questions about the procedures completed in 2021. 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 2021 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 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 using an invasive method which is not used for identification of the animal, 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, <https://www.health-ni.gov.uk/publications/aspa-actual-severity-reporting> and <https://www.health-ni.gov.uk/publications/aspa-severity-classification-genetically-altered-animals>.

### **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 translational/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. Table 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 2021 were:

- a. The number of procedures completed was 29,221. Of these 7,077 (24.2%) related to the creation/breeding of genetically altered animals that were not used in further procedures and the remaining 22,144 (75.8%) were experimental procedures (Table 1).
- b. The number of animals used for the first time was 28,953. This is in comparison to 22,291 in 2020 (Table 1a).
- c. Of the 22,144 experimental procedures completed in 2021, the majority involved mice (79.5% or 17,594). Domestic fowl accounted for approximately 7.7% of the total experimental procedures (1,714 procedures). Fish (other than Zebrafish) accounted for approximately 3.0% of the total experimental procedures (673 procedures). Sheep accounted for approximately 2.9% of the total experimental procedures (651 procedures). Rats accounted for 2.7% of total experimental procedures (606 procedures). The remaining procedures were carried out on other mammals. (Table 1).
- d. In 2021, 68.7% of animals used for the first time in experimental procedures were born at establishments within the UK (15,024 animals). 30.1% of animals used were born in the EU (6,588 animals), with the remaining 1.2% born elsewhere in the world (264 animals). (Table 2).
- e. The majority of experimental procedures completed in 2021 used animals that had not been genetically modified (55.4% or 12,272 procedures). 22.5% (4,976 procedures) involved genetically modified animals without a harmful phenotype, i.e. a harmful physical or chemical defect and 22.1% (4,896 procedures) involved genetically modified animals with a harmful phenotype (Table 4).
- f. Of the severity assessments undertaken for the 22,144 experimental procedures completed in 2021: 10.1% were assessed as sub-threshold; 26.9% were assessed as mild; 58.1% were assessed as moderate; 3.9% were assessed as severe and 0.9% were non-recovery (Table 3).
- g. Of the 29,221 total procedures carried out in 2021: the majority, 37.8% (11,057) were undertaken for translational/applied research; 29.6% (8,650) were undertaken for basic research; 6.1% (1,771) related to protection of the natural environment; 2.2% (643) were undertaken for regulatory purposes; and 0.1% (15) were undertaken for forensic enquiries (Table 1).
- h. In 2021, 8,650 procedures were undertaken for basic research purposes. Of these, the majority, 95.3% (8,247 procedures) were undertaken for the study of oncology and specified or multi-organ systems. The remaining 4.7% (403 procedures) were undertaken for the study of animal biology (including ethology/animal behaviour) or other purposes (Table 5).
- i. In 2021, 11,057 procedures were undertaken for translational/applied research purposes. Of those 88.8% (9,822 procedures) were undertaken for research relating to human cancer and other disorders. Procedures relating to research into animal diseases amounted to 6.8% (756 procedures). Procedures undertaken for research into diagnosis of diseases amounted to 2.6% (290) and the remaining 1.7% (189) were undertaken for procedures relating to research into non-regulatory toxicology and ecotoxicology. (Table 6)

- j. In 2021, 643 experimental procedures were undertaken for regulatory purposes. The majority of these, 67.0% (431 procedures) were for toxicity and other safety testing, including pharmacology. The remainder were for other efficacy and tolerance testing, other quality controls and blood based products. (Table 7.1).
- k. Of the 643 experimental procedures undertaken for regulatory purposes, most were carried out to satisfy legislation on medicinal products for veterinary use (and their residues), 70.9% or 456 procedures. The remaining 29.1% (187 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 7,320 procedures which related to the creation and breeding of genetically altered animals (not used in experimental procedures) (Table 8), 96.7% (7,077 procedures) were for the maintenance of established lines of genetically altered animals (Table 10). The remaining 3.3% (243 procedures) related to the creation of new lines of genetically altered animals. (Table 9.1).
- m. Most procedures undertaken in 2021 (15,566 or 53.3%) were carried out in universities / medical schools. Commercial organisations accounted for 10,178 of the total procedures (34.8%); and Non-profit making organisations, 3,447 procedures (11.9%). (Table 11).
- n. Returns were completed in respect of 108 project licences in 2021 (5 more compared to 2020). Of these, 67 licences reported having carried out countable procedures in 2021. (Table 11).
- o. During 2021, the number of personal licences which were operational and authorised to carry out regulated procedures under the act was 489. (Table 13).

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

Northern Ireland 2021

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							
<b>Mammal</b>															
Mouse ( <i>Mus musculus</i> )	7,981	9,613	0	0	0	0	0	0	0	0	0	17,594	6,973	24,567	84.1
Rat ( <i>Rattus norvegicus</i> )	44	562	0	0	0	0	0	0	0	0	0	606	104	710	2.4
Culinea-pig ( <i>Cavia porcellus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Chinese) ( <i>Cricetus griseus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )	0	60	0	0	0	0	0	0	0	0	0	60	0	60	0.2
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	9	0	0	0	0	0	0	0	0	0	0	9	0	9	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Beagle ( <i>Canis lupus familiaris</i> )	0	0	0	0	0	0	0	0	0	0	61	61	0	61	0.2
Other dog (other <i>Canis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	128	40	0	0	0	0	0	0	0	0	38	206	0	206	0.7
Goat ( <i>Capra aegagrus hircus</i> )	0	0	0	0	0	0	0	0	0	0	24	24	0	24	0.1
Sheep ( <i>Ovis aries</i> )	37	269	0	0	0	0	0	0	0	0	330	651	0	651	2.2
Cattle ( <i>Bos primigenius</i> )	313	108	0	0	0	0	0	0	0	0	104	525	0	525	1.8
<b>Primate</b>															
New World monkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Prosimians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey ( <i>Macaca fascicularis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey ( <i>Macaca mulatta</i> )	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 <i>Mammalia</i> )	0	21	0	0	0	0	0	0	0	0	0	21	0	21	0.1
<b>Bird</b>															
Domestic fowl ( <i>Gallus domesticus</i> )	68	384	1,176	0	0	0	0	0	0	0	86	1,714	0	1,714	5.9
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other bird (other <i>Aves</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Reptile (Reptilia)</b>															
<b>Amphibian</b>															
Rana ( <i>temporaria and pipiens</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Xenopus ( <i>laevis and tropicalis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Fish</b>															
Zebrafish ( <i>Danio rerio</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other fish (other <i>Pisces</i> )	70	0	595	8	0	0	0	0	0	0	0	673	0	673	2.3
<b>Cephalopod (Cephalopoda)</b>															
<b>Total</b>	<b>8,650</b>	<b>11,057</b>	<b>1,771</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>643</b>	<b>22,144</b>	<b>7,077</b>	<b>29,221</b>	<b>100.0</b>
<b>% of total</b>	<b>29.6</b>	<b>37.8</b>	<b>6.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>2.2</b>	<b>75.8</b>	<b>24.2</b>	<b>100.0</b>	

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

Species of animal	Experimental purpose of procedure (excluding creation & breeding)										Creation & breeding of GA animals not used in experimental procedures	Total animals used for the first time in procedures	% of total animals used for the first time in procedures		
	Experimental purpose of procedure (excluding creation & breeding)														
	Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries	Regulatory	Total animals used for the first time in experimental procedures							
<b>Mammal</b>															
Mouse ( <i>Mus musculus</i> )	7,981	9,613	0	0	0	0	0	0	0	0	0	17,594	6,973	24,567	84.9
Rat ( <i>Rattus norvegicus</i> )	44	562	0	0	0	0	0	0	0	0	0	606	104	710	2.5
Guinea-pig ( <i>Cavia porcellus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Chinese) ( <i>Cricetulus griseus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )	0	60	0	0	0	0	0	0	0	0	0	60	0	60	0.2
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rabbit ( <i>Dryolagus cuniculus</i> )	9	0	0	0	0	0	0	0	0	0	0	9	0	9	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Beagle ( <i>Canis lupus familiaris</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other dog (other <i>Canis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	128	40	0	0	0	0	0	0	0	0	0	202	0	202	0.7
Goat ( <i>Capra aegagrus hircus</i> )	0	0	0	0	0	0	0	0	0	0	0	24	0	24	0.1
Sheep ( <i>Ovis aries</i> )	37	269	0	0	0	15	0	0	0	0	0	635	0	635	2.2
Cattle ( <i>Bos primigenius</i> )	224	10	0	0	0	0	0	0	0	0	0	338	0	338	1.2
<b>Primate</b>															
New World monkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Prosimians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey ( <i>Macaca fascicularis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey ( <i>Macaca mulatta</i> )	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 <i>Mammalia</i> )	0	21	0	0	0	0	0	0	0	0	0	21	0	21	0.1
<b>Bird</b>															
Domestic fowl ( <i>Gallus domesticus</i> )	68	384	1,176	0	0	0	0	0	0	0	0	1,714	0	1,714	5.9
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other bird (other <i>Aves</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Reptile (Reptilia)</b>															
<b>Amphibian</b>															
Rana ( <i>temporaria and pipiens</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Xenopus ( <i>laevis and tropicalis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Fish</b>															
Zebrafish ( <i>Danio rerio</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other fish (other <i>Pisces</i> )	70	0	595	8	0	0	0	0	0	0	0	673	0	673	2.3
<b>Cephalopod (Cephalopoda)</b>															
<b>Total</b>	<b>8,561</b>	<b>10,959</b>	<b>1,771</b>	<b>8</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21,876</b>	<b>7,077</b>	<b>28,953</b>	<b>100.0</b>
<b>% of total</b>	<b>29.6</b>	<b>37.9</b>	<b>6.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.0</b>	<b>75.6</b>	<b>24.4</b>	<b>100.0</b>	<b>0.0</b>

**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 2021

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		
<b>Mammal</b>								
Mouse ( <i>Mus musculus</i> )*	11,386	0	5,944	0	0	264	17,594	80.4
Rat ( <i>Rattus norvegicus</i> )*	406	0	200	0	0	0	606	2.8
Guinea-pig ( <i>Cavia porcellus</i> )*	0	0	0	0	0	0	0	0.0
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )*	0	0	0	0	0	0	0	0.0
Hamster (Chinese) ( <i>Cricetus griseus</i> )*	0	0	0	0	0	0	0	0.0
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )*	0	0	60	0	0	0	60	0.3
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	9	0	0	0	0	0	9	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0.0
Beagle ( <i>Canis lupus familiaris</i> )	0	0	0	0	0	0	0	0.0
Other dog (other <i>Canis</i> )	0	0	0	0	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	178	24	0	0	0	0	202	0.9
Goat ( <i>Capra aegagrus hircus</i> )	0	24	0	0	0	0	24	0.1
Sheep ( <i>Ovis aries</i> )	37	598	0	0	0	0	635	2.9
Cattle ( <i>Bos primigenius</i> )	208	130	0	0	0	0	338	1.5
<b>Other mammal (other <i>Mammalia</i>)</b>	0	21	0	0	0	0	21	0.1
<b>Bird</b>								
Domestic fowl ( <i>Gallus domesticus</i> )	68	1,330	384	0	0	0	1,782	8.1
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0	0	0	0.0
Other bird (other <i>Aves</i> )	0	0	0	0	0	0	0	0.0
<b>Reptile (<i>Reptilia</i>)</b>	0	0	0	0	0	0	0	0.0
<b>Amphibian</b>								
Rana ( <i>temporaria and pipiens</i> )*	0	0	0	0	0	0	0	0.0
Xenopus ( <i>laevis and tropicalis</i> )*	0	0	0	0	0	0	0	0.0
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0	0	0	0.0
<b>Fish</b>								
Zebrafish ( <i>Danio rerio</i> )*	0	0	0	0	0	0	0	0.0
Other fish (other <i>Pisces</i> )	0	605	0	0	0	0	605	2.8
<b>Cephalopod (<i>Cephalopoda</i>)</b>	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>12,292</b>	<b>2,732</b>	<b>6,588</b>	<b>0</b>	<b>0</b>	<b>264</b>	<b>21,876</b>	<b>100.0</b>
<b>% of total</b>	<b>56.2</b>	<b>12.5</b>	<b>30.1</b>	<b>0.0</b>	<b>0.0</b>	<b>1.2</b>		

\* 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 3**

Northern Ireland 2021

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 ( <i>Mus musculus</i> )	Sub threshold	1,081	12	0	0	0	0	0	1,093	6.2
	Non - recovery	147	23	0	0	0	0	0	170	1.0
	Mild	3,732	155	0	0	0	0	0	3,887	22.1
	Moderate	2,665	8,979	0	0	0	0	0	11,644	66.2
	Severe	356	444	0	0	0	0	0	800	4.5
<b>Total</b>	<b>7,981</b>	<b>9,613</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17,594</b>	<b>100.0</b>	
Rat ( <i>Rattus norvegicus</i> )	Sub threshold	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	5	0	0	0	0	0	5	0.8
	Mild	12	72	0	0	0	0	0	84	13.9
	Moderate	31	485	0	0	0	0	0	516	85.1
	Severe	1	0	0	0	0	0	0	1	0.2
<b>Total</b>	<b>44</b>	<b>562</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>606</b>	<b>100.0</b>	
Guinea-pig ( <i>Cavia porcellus</i> )	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
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>	
Other rodent <sup>1</sup>	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	60	0	0	0	0	0	60	100.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>0</b>	<b>60</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>60</b>	<b>100.0</b>	
Rabbit ( <i>Oryctolagus cuniculus</i> )	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	9	0	0	0	0	0	0	9	100.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>100.0</b>	
Cat ( <i>Felis catus</i> )	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
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>	
Dog <sup>2</sup>	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	61	61	100.0
	Moderate	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>61</b>	<b>61</b>	<b>100.0</b>	

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

Northern Ireland 2021

Species of animal	Actual Severity	Experimental purpose of procedure							Regulatory	Total	% of species total
		Basic Research	Translational/ Applied research	Protection of the natural environment	Preservation of species	Higher education or training	Forensic enquiries				
Ferret ( <i>Mustela putorius furo</i> )	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Horse and other equid ( <i>Equidae</i> )	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Pig ( <i>Sus scrofa domesticus</i> )	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	12	16	0	0	0	0	0	0	0	13.6
	Mild	116	0	0	0	0	0	37	153	74.3	
	Moderate	0	22	0	0	0	0	1	23	11.2	
	Severe	0	2	0	0	0	0	0	2	1.0	
<b>Total</b>	<b>128</b>	<b>40</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>38</b>	<b>206</b>	<b>100.0</b>		
Other ungulate <sup>3</sup>	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	149	377	0	0	0	0	455	996	83.0	
	Moderate	198	0	0	0	0	0	3	201	16.8	
	Severe	3	0	0	0	0	0	0	3	0.3	
<b>Total</b>	<b>350</b>	<b>377</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>458</b>	<b>1,200</b>	<b>100.0</b>		
Other mammal (other <i>Mammalia</i> )	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	21	0	0	0	0	0	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	
<b>Total</b>	<b>0</b>	<b>21</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>100.0</b>		
Primate	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>	
Bird	Sub threshold	0	0	1,148	0	0	0	0	1,148	67.0	
	Non - recovery	0	0	0	0	0	0	0	0	0.0	
	Mild	0	0	0	0	0	0	86	86	5.0	
	Moderate	0	384	28	0	0	0	0	412	24.0	
	Severe	68	0	0	0	0	0	0	68	4.0	
<b>Total</b>	<b>68</b>	<b>384</b>	<b>1,176</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>86</b>	<b>1,714</b>	<b>100.0</b>		

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

Northern Ireland 2021

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			
Reptile	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Amphibian	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Fish	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	595	8	0	0	0	0	0	89.6
	Moderate	70	0	0	0	0	0	0	0	0	10.4
	Severe	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>70</b>	<b>0</b>	<b>595</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>673</b>	<b>100.0</b>	
Cephalopods	Sub threshold	0	0	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>	
All species	Sub threshold	1,081	12	1,148	0	0	0	0	0	0	10.1
	Non - recovery	159	44	0	0	0	0	0	0	0	0.9
	Mild	4,018	685	595	8	0	15	639	0	203	26.9
	Moderate	2,964	9,870	28	0	0	0	4	0	5,960	58.1
	Severe	428	446	0	0	0	0	0	0	874	3.9
<b>Total</b>	<b>8,650</b>	<b>11,057</b>	<b>1,771</b>	<b>8</b>	<b>0</b>	<b>15</b>	<b>643</b>	<b>0</b>	<b>22,144</b>	<b>100.0</b>	

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 2021

Species of animal	Genetic status			Total	% of total
	Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
<b>Mammal</b>					
Mouse ( <i>Mus musculus</i> )	7,722	4,976	4,896	17,594	79.5
Rat ( <i>Rattus norvegicus</i> )	606	0	0	606	2.7
Guinea-pig ( <i>Cavia porcellus</i> )	0	0	0	0	0.0
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )	0	0	0	0	0.0
Hamster (Chinese) ( <i>Cricetulus griseus</i> )	0	0	0	0	0.0
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )	60	0	0	60	0.3
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	9	0	0	9	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0.0
Beagle ( <i>Canis lupus familiaris</i> )	61	0	0	61	0.3
Other dog (other <i>Canis</i> )	0	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	206	0	0	206	0.9
Goat ( <i>Capra aegagrus hircus</i> )	24	0	0	24	0.1
Sheep ( <i>Ovis aries</i> )	651	0	0	651	2.9
Cattle ( <i>Bos primigenius</i> )	525	0	0	525	2.4
<b>Primate</b>					
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 ( <i>Macaca fascicularis</i> )	0	0	0	0	0.0
Rhesus monkey ( <i>Macaca mulatta</i> )	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
<b>Other mammal (other <i>Mammalia</i>)</b>	21	0	0	21	0.1
<b>Bird</b>					
Domestic fowl ( <i>Gallus domesticus</i> )	1,714	0	0	1,714	7.7
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0.0
Other bird (other <i>Aves</i> )	0	0	0	0	0.0
<b>Reptile (<i>Reptilia</i>)</b>	0	0	0	0	0.0
<b>Amphibian</b>					
Rana ( <i>temporaria and pipiens</i> )	0	0	0	0	0.0
Xenopus ( <i>laevis and tropicalis</i> )	0	0	0	0	0.0
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0.0
<b>Fish</b>					
Zebrafish ( <i>Danio rerio</i> )	0	0	0	0	0.0
Other fish (other <i>Pisces</i> )	673	0	0	673	3.0
<b>Cephalopod (<i>Cephalopoda</i>)</b>	0	0	0	0	0.0
<b>Total</b>	<b>12,272</b>	<b>4,976</b>	<b>4,896</b>	<b>22,144</b>	<b>100.0</b>
<b>% of total</b>	<b>55.4</b>	<b>22.5</b>	<b>22.1</b>		

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

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 / Repro-ductive System	Sensory Organs (skin, eyes and ears)	Endocrine System / Meta-bolism	Multi-systemic			Ethology / Animal Behaviour / Animal Biology	Other		
<b>Mammal</b>																	
Mouse ( <i>Mus musculus</i> )	2,324	242	2,006	88	0	0	1,203	0	870	1,248	0	0	0	0	0	0	92.3
Rat ( <i>Rattus norvegicus</i> )	0	0	0	0	0	0	0	0	44	0	0	0	0	0	0	0	0.5
Guinea-pig ( <i>Cavia porcellus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Chinese) ( <i>Cricetus griseus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0.1
Rabbit ( <i>Oryctolagus cuniculus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Beagle ( <i>Canis lupus familiaris</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other dog (other <i>Canis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	0	0	0	0	0	0	0	0	0	0	12	116	0	0	0	0	1.5
Goat ( <i>Capra aegagrus hircus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Sheep ( <i>Ovis aries</i> )	0	0	0	0	0	0	16	0	0	0	0	37	0	0	0	0	0.4
Cattle ( <i>Bos primigenius</i> )	0	0	0	0	0	0	0	0	0	0	185	112	0	0	0	0	3.6
<b>Primate</b>																	
New World monkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Marmoset and tamarin	0	0	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	0.0
Other New World Monkey	0	0	0	0	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	0	0	0.0
Prosimians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey ( <i>Macaca fascicularis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey ( <i>Macaca mulatta</i> )	0	0	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	0.0
Baboons	0	0	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	0.0
Other Old World Monkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Other mammal (other <i>Mammalia</i>)</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Bird</b>																	
Domestic fowl ( <i>Gallus domesticus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	68	0	0	0	0.8
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other bird (other <i>Aves</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Reptile (<i>Reptilia</i>)</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Amphibian</b>																	
Rana ( <i>temporaria and pipiens</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Xenopus ( <i>laevis and tropicalis</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Fish</b>																	
Zebrafish ( <i>Danio rerio</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other fish (other <i>Pisces</i> )	0	0	0	0	0	0	0	0	0	0	0	70	0	0	0	0	0.8
<b>Cephalopod (<i>Cephalopoda</i>)</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	2,324	242	2,006	88	0	0	1,228	0	914	1,248	197	335	68	0	0	0	100.0
<b>% of total</b>	26.9	2.8	23.2	1.0	0.0	0.0	14.2	0.0	10.6	14.4	2.3	3.9	0.8	0.0	0.0	0.0	

**Table 6 Experimental procedures (non-regulatory) by species of animal: translational/applied research, page 1 of 2**  
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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	
<b>Mammal</b>	6,760	133	0	6	981	73	0	876	0	
Mouse ( <i>Mus musculus</i> )	280	72	0	0	0	59	0	124	0	
Rat ( <i>Rattus norvegicus</i> )	0	0	0	0	0	0	0	0	0	
Guinea-pig ( <i>Cavia porcellus</i> )	0	0	0	0	0	0	0	0	0	
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )	0	0	0	0	0	0	0	0	0	
Hamster (Chinese) ( <i>Cricetus ariseus</i> )	0	60	0	0	0	0	0	0	0	
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )	0	0	0	0	0	0	0	0	0	
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0	0	0	0	0	
Rabbit ( <i>Oryctolagus cuniculus</i> )	0	0	0	0	0	0	0	0	0	
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0	0	
Beagle ( <i>Canis lupus familiaris</i> )	0	0	0	0	0	0	0	0	0	
Other dog (other <i>Canis</i> )	0	0	0	0	0	0	0	0	0	
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	
Pig ( <i>Sus scrofa domestica</i> )	0	0	16	0	0	0	0	0	0	
Goat ( <i>Capra aegagrus hircus</i> )	0	0	0	0	0	0	0	0	0	
Sheep ( <i>Ovis aries</i> )	0	0	0	0	0	0	0	0	0	
Cattle ( <i>Bos primigenius</i> )	0	0	0	0	0	0	0	0	0	
<b>Primate</b>										
New World monkey	0	0	0	0	0	0	0	0	0	
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	0	0	0	0	0	0	0	0	0	
Prosimians	0	0	0	0	0	0	0	0	0	
Cynomolgus monkey ( <i>Macaca fascicularis</i> )	0	0	0	0	0	0	0	0	0	
Rhesus monkey ( <i>Macaca mulatta</i> )	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	
<b>Other mammal (other <i>Mammalia</i>)</b>	0	0	0	0	0	0	0	0	0	
<b>Bird</b>										
Domestic fowl ( <i>Gallus domesticus</i> )	0	0	0	0	0	0	0	0	0	
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0	0	0	0	0	
Other bird (other <i>Aves</i> )	0	0	0	0	0	0	0	0	0	
<b>Reptile (<i>Reptilia</i>)</b>	0	0	0	0	0	0	0	0	0	
<b>Amphibian</b>										
Rana ( <i>temporaria and pipiens</i> )	0	0	0	0	0	0	0	0	0	
Xenopus ( <i>laevis and tropicalis</i> )	0	0	0	0	0	0	0	0	0	
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0	0	0	0	0	
<b>Fish</b>										
Zebrafish ( <i>Danio rerio</i> )	0	0	0	0	0	0	0	0	0	
Other fish (other <i>Pisces</i> )	0	0	0	0	0	0	0	0	0	
<b>Cephalopod (<i>Cephalopoda</i>)</b>	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>7,040</b>	<b>265</b>	<b>16</b>	<b>6</b>	<b>981</b>	<b>132</b>	<b>0</b>	<b>1,000</b>	<b>0</b>	<b>0.0</b>
<b>% of total</b>	<b>63.7</b>	<b>2.4</b>	<b>0.1</b>	<b>0.1</b>	<b>8.9</b>	<b>1.2</b>	<b>0.0</b>	<b>9.0</b>	<b>0.0</b>	<b>0.0</b>

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

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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				
<b>Mammal</b>	382	0	0	240	0	0	0	162	0	0	9,613	86.9
Mouse ( <i>Mus musculus</i> )	0	0	0	0	0	0	0	27	0	0	562	5.1
Rat ( <i>Rattus norvegicus</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Guinea-pig ( <i>Cavia porcellus</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamster (Chinese) ( <i>Cricetus griseus</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )	0	0	0	0	0	0	0	0	0	0	60	0.5
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Beagle ( <i>Canis lupus familiaris</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Other dog (other <i>Canis</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	0	0	0	24	0	0	0	0	0	0	40	0.4
Goat ( <i>Capra aegagrus hircus</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Sheep ( <i>Ovis aries</i> )	0	0	0	0	0	269	0	0	0	0	269	2.4
Cattle ( <i>Bos primigenius</i> )	0	0	0	108	0	0	0	0	0	0	108	1.0
<b>Primate</b>	0	0	0	0	0	0	0	0	0	0	0	0.0
New World monkey	0	0	0	0	0	0	0	0	0	0	0	0.0
Marmoset and tamarin	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
Other 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
Prosimians	0	0	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey ( <i>Macaca fascicularis</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey ( <i>Macaca mulatta</i> )	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
Baboons	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
Other Old World Monkey	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Other mammal (other <i>Mammalia</i>)</b>	0	0	0	0	0	21	0	0	0	0	21	0.2
<b>Bird</b>	0	0	0	384	0	0	0	0	0	0	384	3.5
Domestic fowl ( <i>Gallus domesticus</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Other bird (other <i>Aves</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Reptile (<i>Reptilia</i>)</b>	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Amphibian</b>	0	0	0	0	0	0	0	0	0	0	0	0.0
Rana ( <i>temporaria and pipiens</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Xenopus ( <i>laevis and tropicalis</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Fish</b>	0	0	0	0	0	0	0	0	0	0	0	0.0
Zebrafish ( <i>Danio rerio</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
Other fish (other <i>Pisces</i> )	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Cephalopod (<i>Cephalopoda</i>)</b>	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	382	0	0	756	0	290	0	189	0	0	11,057	100.0
<b>% of total</b>	3.5	0.0	0.0	6.8	0.0	2.6	0.0	1.7	0.0	0.0		

**Table 7.1 Experimental procedures by species of animal: regulatory use**

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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				
<b>Mammal</b>										
Mouse ( <i>Mus musculus</i> )	0	0	0	0	0	0	0	0	0	0.0
Rat ( <i>Rattus norvegicus</i> )	0	0	0	0	0	0	0	0	0	0.0
Guinea-pig ( <i>Cavia porcellus</i> )	0	0	0	0	0	0	0	0	0	0.0
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )	0	0	0	0	0	0	0	0	0	0.0
Hamster (Chinese) ( <i>Cricetus ariseus</i> )	0	0	0	0	0	0	0	0	0	0.0
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )	0	0	0	0	0	0	0	0	0	0.0
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0	0	0	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	0	0	0	0	0	0	0	0	0	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0	0	0.0
Beagle ( <i>Canis lupus familiaris</i> )	0	0	0	0	0	0	29	0	61	9.5
Other dog (other <i>Canis</i> )	0	0	0	0	0	0	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	0	0	0	0	0	0	10	0	38	5.9
Goat ( <i>Capra aegagrus hircus</i> )	0	0	0	0	0	0	0	24	24	3.7
Sheep ( <i>Ovis aries</i> )	2	0	0	0	0	0	11	80	330	51.3
Cattle ( <i>Bos primigenius</i> )	0	0	0	0	0	0	0	80	104	16.2
<b>Primate</b>										
New World monkey	0	0	0	0	0	0	0	0	0	0.0
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	0	0	0	0	0	0	0	0	0	0.0
Prosimians	0	0	0	0	0	0	0	0	0	0.0
Cynomolgus monkey ( <i>Macaca fascicularis</i> )	0	0	0	0	0	0	0	0	0	0.0
Rhesus monkey ( <i>Macaca mulatta</i> )	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
<b>Other mammal (other Mammalia)</b>	0	0	0	0	0	0	0	0	0	0.0
<b>Bird</b>										
Domestic fowl ( <i>Gallus domesticus</i> )	0	0	0	0	0	0	0	0	86	13.4
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0	0	0	0	0	0.0
Other bird (other <i>Aves</i> )	0	0	0	0	0	0	0	0	0	0.0
<b>Reptile (Reptilia)</b>	0	0	0	0	0	0	0	0	0	0.0
<b>Amphibian</b>										
Rana ( <i>temporaria and pipiens</i> )	0	0	0	0	0	0	0	0	0	0.0
Xenopus ( <i>laevis and tropicalis</i> )	0	0	0	0	0	0	0	0	0	0.0
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0	0	0	0	0	0.0
<b>Fish</b>										
Zebrafish ( <i>Danio rerio</i> )	0	0	0	0	0	0	0	0	0	0.0
Other fish (other <i>Pisces</i> )	0	0	0	0	0	0	0	0	0	0.0
<b>Cephalopod (Cephalopoda)</b>	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	2	0	0	0	0	0	50	160	431	643
<b>% of total</b>	0.3	0.0	0.0	0.0	0.0	0.0	7.8	24.9	67.0	100.0



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

Northern Ireland 2021

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			
<b>Mammal</b>													
Mouse ( <i>Mus musculus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0
Rat ( <i>Rattus norvegicus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0
All other rodent <sup>1</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabbit ( <i>Oryctolagus cuniculus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0
Dog	0	61	0	0	0	0	0	0	0	0	0	0	61
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig ( <i>Sus scrofa domestica</i> )	0	38	0	0	0	0	0	0	0	0	0	0	38
Other ungulate <sup>2</sup>	0	271	0	0	0	0	187	0	0	0	0	0	458
<b>Primate</b>													
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 <i>Mammalia</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Bird</b>	0	86	0	0	0	0	0	0	0	0	0	0	86
<b>Reptile, amphibian</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Fish</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Cephalopod</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	456	0	0	0	0	187	0	0	0	0	0	643
<b>% of total</b>	0.0	70.9	0.0	0.0	0.0	0.0	29.1	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 7.3 Experimental procedures by species of animal: regulatory use by origin of legislative requirement**

**Northern Ireland 2021**

Species of animal	Legislative requirement			Total	% of total
	Legislation satisfying EU requirements	Legislation satisfying only UK requirements	Legislation satisfying Non-EU requirements only		
<b>Mammal</b>					
Mouse ( <i>Mus musculus</i> )	0	0	0	0	0.0
Rat ( <i>Rattus norvegicus</i> )	0	0	0	0	0.0
Guinea-pig ( <i>Cavia porcellus</i> )	0	0	0	0	0.0
Hamster (Syrian) ( <i>Mesocricetus auratus</i> )	0	0	0	0	0.0
Hamster (Chinese) ( <i>Cricetulus griseus</i> )	0	0	0	0	0.0
Mongolian Gerbil ( <i>Meriones unguiculatus</i> )	0	0	0	0	0.0
Other rodent (other <i>Rodentia</i> )	0	0	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	0	0	0	0	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0.0
Beagle ( <i>Canis lupus familiaris</i> )	61	0	0	61	9.5
Other dog (other <i>Canis</i> )	0	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0.0
Pig ( <i>Sus scrofa domesticus</i> )	38	0	0	38	5.9
Goat ( <i>Capra aegagrus hircus</i> )	24	0	0	24	3.7
Sheep ( <i>Ovis aries</i> )	330	0	0	330	51.3
Cattle ( <i>Bos primigenius</i> )	104	0	0	104	16.2
<b>Primate</b>					
<b>New World monkey</b>					
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
<b>Old World monkey</b>					
Prosimians	0	0	0	0	0.0
Cynomolgus monkey ( <i>Macaca fascicularis</i> )	0	0	0	0	0.0
Rhesus monkey ( <i>Macaca mulatta</i> )	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
<b>Other mammal (other <i>Mammalia</i>)</b>	0	0	0	0	0.0
<b>Bird</b>					
Domestic fowl ( <i>Gallus domesticus</i> )	86	0	0	86	13.4
Quail ( <i>Coturnix coturnix</i> )	0	0	0	0	0.0
Other bird (other <i>Aves</i> )	0	0	0	0	0.0
<b>Reptile (<i>Reptilia</i>)</b>	0	0	0	0	0.0
<b>Amphibian</b>					
Rana ( <i>temporaria and pipiens</i> )	0	0	0	0	0.0
Xenopus ( <i>laevis and tropicalis</i> )	0	0	0	0	0.0
Other amphibian (other <i>Amphibia</i> )	0	0	0	0	0.0
<b>Fish</b>					
Zebrafish ( <i>Danio rerio</i> )	0	0	0	0	0.0
Other fish (other <i>Pisces</i> )	0	0	0	0	0.0
<b>Cephalopod (<i>Cephalopoda</i>)</b>	0	0	0	0	0.0
<b>Total</b>	<b>643</b>	<b>-</b>	<b>-</b>	<b>643</b>	<b>100.0</b>
<b>% of total</b>	<b>100.0</b>	<b>0.0</b>	<b>0.0</b>	<b>100.0</b>	

**Table 7-4 Experimental procedures by species of animal: regulatory use by type of test - toxicity and other safety testing including pharmacology**

Northern Ireland 2021

Species of animal	Acute and sub-acute toxicity testing methods				Other type of regulatory test or procedure										Safety testing in food and feed area	Target animal safety
	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	Total				
<b>Mammal</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mouse ( <i>Mus musculus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rat ( <i>Rattus norvegicus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All other rodent <sup>1</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rabbit ( <i>Oryctolagus cuniculus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cat ( <i>Felis catus</i> )	0	0	0	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	0	0	0
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pig ( <i>Sus scrofa domestica</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	12	189	0
Other ungulate <sup>2</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Primate</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New World monkey	0	0	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	0	0
Other mammal (other <i>Mammalia</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Bird</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Reptile, amphibian</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Fish</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Cephalopod</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>287</b>	<b>0</b>
<b>% of total</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>66.6</b>	<b>0.0</b>

Northern Ireland 2021

Species of animal	Other type of regulatory test or procedure				Ecotoxicity						Other type of toxicity or safety test	Total	% of total		
	Neurotoxicity	Phototoxicity	Pharmodynamics	Kinetics	Acute toxicity	Chronic toxicity	Reproductive toxicity	Endocrine activity	Bioaccumulation	Other					
<b>Mammal</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Mouse ( <i>Mus musculus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rat ( <i>Rattus norvegicus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
All other rodent <sup>1</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Cat ( <i>Felis catus</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Dog	0	0	0	32	0	0	0	0	0	0	0	0	0	32	7.4
Ferret ( <i>Mustela putorius furo</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other carnivore (other <i>Carnivora</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	0	0	0	16	0	0	0	0	0	0	0	0	0	28	6.5
Other ungulate <sup>2</sup>	0	0	0	96	0	0	0	0	0	0	0	0	0	285	66.1
<b>Primate</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
New World monkey	0	0	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	0.0
Other mammal (other <i>Mammalia</i> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Bird</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	86	20.0
<b>Reptile, amphibian</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Fish</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Cephalopod</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>144</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>431</b>	<b>100.0</b>
<b>% of total</b>	<b>0.0</b>	<b>0.0</b>	<b>33.4</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>100.0</b>	<b>0.0</b>

1. "All other rodent" includes guinea pig (*Cavia porcellus*), Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetus 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, page 1 of 2**

Northern Ireland 2021

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 ( <i>Mus musculus</i> )	Sub threshold	5	3,289	2,063	5,357	74.2
	Non - recovery	0	0	0	0	0.0
	Mild	69	1,227	228	1,524	21.1
	Moderate	0	10	244	254	3.5
	Severe	1	52	28	81	1.1
	<b>Total</b>		<b>75</b>	<b>4,578</b>	<b>2,563</b>	<b>7,216</b>
Rat ( <i>Rattus norvegicus</i> )	Sub threshold	0	102	0	102	98.1
	Non - recovery	0	0	0	0	0.0
	Mild	0	0	0	0	0.0
	Moderate	0	0	0	0	0.0
	Severe	0	2	0	2	1.9
	<b>Total</b>		<b>0</b>	<b>104</b>	<b>0</b>	<b>104</b>
Guinea-pig ( <i>Cavia porcellus</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Other rodent <sup>1</sup>	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Rabbit ( <i>Oryctolagus cuniculus</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Cat ( <i>Felis catus</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Ferret ( <i>Mustela putorius furo</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Horse and other equid ( <i>Equidae</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Pig ( <i>Sus scrofa domestica</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**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, page 2 of 2**

Northern Ireland 2021

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		
Other ungulate <sup>2</sup>	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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Other mammal <sup>3</sup>	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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
All species	Sub threshold	5	3,391	2,063	5,459	74.6
	Non - recovery	0	0	0	0	0.0
	Mild	69	1,227	228	1,524	20.8
	Moderate	0	10	244	254	3.5
	Severe	1	54	28	83	1.1
	<b>Total</b>	<b>75</b>	<b>4,682</b>	<b>2,563</b>	<b>7,320</b>	<b>100.0</b>

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, page 1 of 2**

Northern Ireland 2021

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	Not genetically altered	Genetically altered with a harmful phenotype	Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype		
Mouse ( <i>Mus musculus</i> )	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	18	0	0	0	18	0	18	7.4
	Moderate	0	4	0	0	0	4	221	221	90.9
	Severe	0	0	0	0	0	0	0	0	1.6
	Total	0	22	0	0	0	22	221	243	100.0
Rat ( <i>Rattus norvegicus</i> )	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
Guinea-pig ( <i>Cavia porcellus</i> )	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
Other rodent <sup>1</sup>	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 ( <i>Oryctolagus cuniculus</i> )	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
Cat ( <i>Felis catus</i> )	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
Dog	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
Ferret ( <i>Mustela putorius furo</i> )	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 ( <i>Equidae</i> )	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 ( <i>Sus scrofa domestica</i> )	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

**Table 9.1 Creation of new lines of genetically altered animals (not used in experimental procedures) by species of animal, severity and genetic status, page 2 of 2**

Northern Ireland 2021

Species of animal	Actual severity	Basic research by genetic status		Translational/applied research		Total by genetic status			% of species total
		Not genetically altered	Genetically altered without a harmful phenotype	Not genetically altered	Genetically altered without a harmful phenotype	Not genetically altered	Genetically altered without a harmful phenotype	Genetically altered with a harmful phenotype	
Other ungulate <sup>2</sup>	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0.0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Other mammal <sup>3</sup>	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0.0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Primate	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0.0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Bird	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0.0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Reptile	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0.0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Amphibian	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0.0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Fish	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0.0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Cephalopod	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0.0
	Moderate	0	0	0	0	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0.0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
All species	Sub threshold	0	0	0	0	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0.0
	Mild	0	18	0	0	0	0	0	7.4
	Moderate	0	0	0	0	0	0	221	90.9
	Severe	0	4	0	0	0	4	1.6	
	<b>Total</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>243</b>	<b>100.0</b>

1. "Other rodent" includes Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetus 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, page 1 of 2**

Northern Ireland 2021

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	Multi-systemic	Ethology / Animal Behaviour / Animal Biology	Other						
Mouse ( <i>Mus musculus</i> )	Sub threshold	0	0	0	0	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	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	7.4
	Moderate	221	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	221	90.9
Rat ( <i>Rattus norvegicus</i> )	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1.6
	Total	221	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	243	100.0
	Sub threshold	0	0	0	0	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	0	0	0.0
Guinea-pig ( <i>Cavia porcellus</i> )	Mild	0	0	0	0	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	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Other rodent <sup>1</sup>	Sub threshold	0	0	0	0	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	0	0	0.0
	Mild	0	0	0	0	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	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Sub threshold	0	0	0	0	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	0	0	0.0
Cat ( <i>Felis catus</i> )	Mild	0	0	0	0	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	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Sub threshold	0	0	0	0	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	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	Mild	0	0	0	0	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	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	Sub threshold	0	0	0	0	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	0	0	0.0
	Mild	0	0	0	0	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	0	0	0.0
Total	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Sub threshold	0	0	0	0	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	0	0	0.0



**Table 9.2 Creation of new lines of genetically altered animals (not used in experimental procedures) by species of animal and severity: basic research, page 2 of 2**

Northern Ireland 2021

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	Multi-systemic	Ethology / Animal Behaviour / Animal Biology	Other				
Other ungulate <sup>2</sup>	Sub threshold	0	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	0
	Mild	0	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	0
Other mammal <sup>3</sup>	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub threshold	0	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	0
Primate	Mild	0	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	0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	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	0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reptile	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub threshold	0	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	0
Amphibian	Mild	0	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	0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	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	0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mild	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cephalopod	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sub threshold	0	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	0
All species	Mild	0	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	0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	221	221	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		18	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		221	221	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		243	243	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		90.9	90.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1. "Other rodent" includes Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetus 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, page 1 of 2**

Northern Ireland 2021

Species of animal	Actual severity	Translational/applied research														Total	% of species total				
		Human Cancer	Human Infectious Disorders	Human Cardio-vascular Disorders	Human Nervous and Mental Disorders	Human Respiratory Disorders	Human Gastro-intestinal Disorders including Liver	Human Musculo-skeletal Disorders	Human Immune Disorders	Human Urogenital / Repro-ductive Disorders	Human Sensory Organ Disorders (skin, eyes and ears)	Human Endocrine / Meta-bolism Disorders	Other Human Disorders	Animal Diseases and Disorders	Animal Welfare			Diagnosis of diseases	Plant diseases	Non-regulatory toxicology and ecotoxicology	
Mouse ( <i>Mus musculus</i> )	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Rat ( <i>Rattus norvegicus</i> )	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Guinea-pig ( <i>Cavia porcellus</i> )	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Other rodent <sup>1</sup>	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Rabbit ( <i>Oryctolagus cuniculus</i> )	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Cat ( <i>Felis catus</i> )	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Dog	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Ferret ( <i>Mustela putorius furo</i> )	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Horse and other equid ( <i>Equidae</i> )	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Pig ( <i>Sus scrofa domestica</i> )	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0

**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, page 2 of 2**

Species of animal	Actual severity	Translational/applied research														Total	% of species total				
		Human Cancer	Human Infectious Disorders	Human Cardio-vascular Disorders	Human Nervous and Mental Disorders	Human Respiratory Disorders	Human Gastro-intestinal Disorders including Liver	Human Musculo-skeletal Disorders	Human Immune Disorders	Human Urogenital / Repro-ductive Disorders	Human Sensory Disorders (skin, eyes and ears)	Human Endocrine / Meta-bolism Disorders	Other Human Disorders	Animal Diseases and Disorders	Animal Welfare			Diagnosis of diseases	Plant diseases	Non-regulatory toxicology and ecotoxicology	
Other ungulate <sup>2</sup>	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
	Mild	0	0	0	0	0	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	0	0	0	0.0
Other mammal <sup>3</sup>	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
Primates	Mild	0	0	0	0	0	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	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	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	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0.0
Reptile	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
Amphibian	Mild	0	0	0	0	0	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	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	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	0	0	0	0.0
	Non - recovery	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Mild	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0.0
Cephalopod	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Sub threshold	0	0	0	0	0	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	0	0	0	0.0
All species	Mild	0	0	0	0	0	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	0	0	0	0.0
	Severe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

1. "Other rodent" includes Syrian hamster (*Mesocricetus auratus*), Chinese hamster (*Cricetus 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 10 Maintenance of established lines of genetically altered animals (not used in experimental procedures) by species of animal, severity and genetic status, page 1 of 2**

Northern Ireland 2021

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 ( <i>Mus musculus</i> )	Sub threshold	5	3,289	2,063	5,357	76.8
	Non - recovery	0	0	0	0	0.0
	Mild	69	1,209	228	1,506	21.6
	Moderate	0	10	23	33	0.5
	Severe	1	48	28	77	1.1
	<b>Total</b>		<b>75</b>	<b>4,556</b>	<b>2,342</b>	<b>6,973</b>
Rat ( <i>Rattus norvegicus</i> )	Sub threshold	0	102	0	102	98.1
	Non - recovery	0	0	0	0	0.0
	Mild	0	0	0	0	0.0
	Moderate	0	0	0	0	0.0
	Severe	0	2	0	2	1.9
	<b>Total</b>		<b>0</b>	<b>104</b>	<b>0</b>	<b>104</b>
Guinea-pig ( <i>Cavia porcellus</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Other rodent <sup>1</sup>	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Rabbit ( <i>Oryctolagus cuniculus</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Cat ( <i>Felis catus</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Ferret ( <i>Mustela putorius furo</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Horse and other equid ( <i>Equidae</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Pig ( <i>Sus scrofa domesticus</i> )	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
	<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**Table 10 Maintenance of established lines of genetically altered animals (not used in experimental procedures) by species of animal, severity and genetic status, page 2 of 2**

Northern Ireland 2021

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		
Other ungulate <sup>2</sup>	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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
Other mammal <sup>3</sup>	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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
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
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>
All species	Sub threshold	5	3,391	2,063	5,459	77.1
	Non - recovery	0	0	0	0	0.0
	Mild	69	1,209	228	1,506	21.3
	Moderate	0	10	23	33	0.5
	Severe	1	50	28	79	1.1
	<b>Total</b>	<b>75</b>	<b>4,660</b>	<b>2,342</b>	<b>7,077</b>	<b>100.0</b>

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 2021

Type of licensed establishment?	Number of project licences where countable <sup>1</sup> procedures were completed in 2020 by number of procedures										Number of project licences where only non-countable <sup>1</sup> procedures were completed in 2020	Number of project licences where no procedures were completed in 2020	Total number of project licences	Number of procedures		
	Number of procedures													Total	Total	% of total
	1 to 50	51 to 100	101 to 200	201 to 400	401 to 600	601 to 800	801 to 1,000	More than 1,000	Total	% of total						
Public health laboratories	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	
Universities, medical schools	7	5	6	10	4	1	1	4	38	0	23	61	15,566	53.3		
Government departments	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
Other public bodies	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0		
Non-profit-making organisations	8	3	4	1	2	0	0	1	19	0	16	35	3,477	11.9		
Commercial organisations	0	2	4	0	1	1	1	1	10	0	2	12	10,178	34.8		
<b>Total</b>	<b>15</b>	<b>10</b>	<b>14</b>	<b>11</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>67</b>	<b>0</b>	<b>41</b>	<b>108</b>	<b>29,221</b>	<b>100.0</b>		

1. Procedures on adult or free-living animals (including neonatal and juvenile mammals, and newly hatched birds) are counted.

2. 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 2020).

**Table 12 Designated establishments: 2011-2021**

Number of designated places at 31 December 2021

Northern Ireland

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Scientific procedure establishments	5	5	4	4	4	4	4	4	4	4	5
Scientific procedure and breeding establishments	0	0	0	0	0	0	0	1	1	2	2
Scientific procedure breeding and supplying establishments	3	3	4	4	4	4	5	4	4	3	3
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	0	0
<b>Total designated places</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>9</b>	<b>10</b>

**Table 13 Personal Licensees: 2011-2021**

Number of personal licences at 31 December 2021

Northern Ireland

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
582	590	548	548	480	630	669	598	591	498	489

# 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.

The controls of ASPA, and therefore the statistics in the annual release, exclude:

4. non-experimental agricultural practices
5. non-experimental clinical veterinary practices
6. practices undertaken for recognised animal husbandry
7. the administration of any substance or article to an animal for research purposes in accordance with an animal test certificate granted under the Veterinary Medicines Regulations 2013 Sect 3 (2) (b)

### Project and Personal Licences

8. 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.
9. 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.

10. 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.
11. A personal licence is the Department's endorsement that the holder is a suitable and adequately trained 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. They need the endorsement of the named training and competency officer. Satisfactory completion of an accredited training course is required before a personal licence is issued.

### Establishment Licences

12. 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.
13. Licensed establishments are required to appoint the following named persons:
  - Named Animal Care and Welfare Officer (NACWO)
  - Named Veterinary Surgeon (NVS)
  - Named Training and Competence Officer (NTCO)
  - Named Information Officer (NIO)
  - Named Compliance Officer (NCO)

### The Inspectorate

14. The Act creates a requirement for 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, the **replacement** of procedures with others which do not use animals, and 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 standards and controls are adequate and that the terms and conditions of the licences issued under it are being observed.



15. 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.
16. Inspection refers to reviewing existing facilities, projects and procedures, and determining whether they comply with current licences. During 2021, the Department had one Inspector working part time. In this time, the Inspectorate carried out 28 inspections of licenced establishments. Of these inspections, 20 were office-based (carried out remotely) and 8 were carried out on site. Restrictions due to COVID were still in place over some of 2021 which affected the number of on-site inspections. The total inspection time in 2021 was 44 hours and 45 minutes.
17. Advice during inspections is reviewing plans for future facilities or licences (including amendments i.e. changes to existing licences), reviewing and deciding whether proposals are likely to comply with requirements, and informing applicants / licensees about how they can apply best practice. Total advice time during inspections for 2021 was 11 hours.

### **The Animals in Science Committee (ASC)**

18. 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.
19. The Animals in Science Committee is responsible for providing impartial, balanced and objective advice to the Home Office, the Department of Health and to animal welfare bodies on issues relating to the Animals (Scientific Procedures) Act 1986 as amended. (Animals (Scientific Procedures) Act 1986 (legislation.gov.uk))

### **Guidance, Codes of Practice and Statistics**

20. 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. NI uses Home Office publications and advice notes. Current Home Office publications which have been laid before parliament are:
  - Guidance on the operation of the Animals (Scientific Procedures) Act 1986 (2014);
  - Code of practice for the housing and care of animals bred, supplied or used in scientific procedures (December 2014)
  - Annual statistics 2020 (<https://www.gov.uk/government/statistics/statistics-of-scientific-procedures-on-living-animals-great-britain-2020>)
  - Other advice not laid before parliament includes:
  - Use, Keeping Alive and Re-use | Department of Health (health-ni.gov.uk) Re-Homing and Setting Free of Animals | Department of Health (health-ni.gov.uk)
  - Identification And Management Of Patterns Of Low-Level Concerns At Licensed Establishments | Department of Health (health-ni.gov.uk) The Harm–Benefit Analysis Process New Project Licence Applications | Department of Health (health-ni.gov.uk) Guidance on the use of Human Material in Animals | Department of Health (health-ni.gov.uk) Working with Animals Taken from the Wild | Department of Health (health-ni.gov.uk)

## Education and training

21. 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 replacing animal procedures with alternatives which do not involve protected animals, reducing the number of animals used, and refining the procedures to reduce suffering.;
  - 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.
22. Animals (Scientific Procedures) Act 1986 as amended 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 legislative target

23. The licensing team works to specific legislative targets. New project licences should be considered and issued/refused within 40 working days from receipt of application. However, if the application involves a complex or multidisciplinary programme, the process may be extended by a further 15 working days with a clearance target of 55 working days.
24. In 2021, 100% of new project licences were issued within the legislative target of 40 working days: no new project licence applications required a 15 working day extension.
25. In 2021, the Department issued 22 new project licences, 22 amendment project licences and 94 personal licences.





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