


# Statistics of animal use in research and teaching, Victoria

1 January 2019 – 31 December 2019

Report No. 37





Published by Animal Welfare Victoria  
Department of Jobs, Precincts and Regions  
1 Spring Street Melbourne, Victoria 3000  
April 2021

### **Creative Commons**

Unless indicated otherwise, this work is made available under the terms of the Creative Commons Attribution 3.0 Australia licence. To view a copy of this licence, visit [creativecommons.org/licenses/by/3.0/au](https://creativecommons.org/licenses/by/3.0/au). It is a condition of this Creative Commons Attribution 3.0 Licence that you must give credit to the original author who is the State of Victoria.

**ISBN 978-1-76090-427-2 (pdf/online/MS word)**

### **Disclaimer**

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication. While every effort has been made to ensure the currency, accuracy or completeness of the content we endeavour to keep the content relevant and up to date and reserve the right to make changes as require. The Victorian Government, authors and presenters do not accept any liability to any person for the information (or the use of the information) which is provided or referred to in the report.

### **Accessibility**

If you would like to receive this publication in an alternative format, please telephone DJPR Customer Service Centre 136 186 or email [sp.licensing@ecodev.vic.gov.au](mailto:sp.licensing@ecodev.vic.gov.au)

## Table of Contents

Part 1: Guide to reading the report .....	7
<b>1.1 The use of animals in research and teaching .....</b>	<b>7</b>
1.1.1 Why are animals still used for experiments? .....	7
1.1.2 What protections are in place? .....	7
1.1.3 Who is on an AEC? .....	7
<b>1.2 Reporting process .....</b>	<b>8</b>
1.2.1 How is the data collected? .....	8
1.2.2 Why is this data collected? .....	8
1.2.3 What types of animals are counted? .....	8
1.2.4 Where are animals sourced from? .....	8
1.2.5 What is meant by the project purpose? .....	9
1.2.6 What is meant by the project benefit? .....	9
1.2.7 What is meant by the impact of activities? .....	9
1.2.8 What is meant by the number of deaths? .....	9
<b>1.3 Understanding the 2019 statistics .....</b>	<b>10</b>
1.3.1 Why is the number of animals so much higher in 2019? .....	10
1.3.2 Why are 82,250,208 embryonated eggs reported in 2019? .....	10
1.3.3 Why are there fewer tables in the 2019 report than in previous years? .....	10
Part 2: Number of animals reported as used in 2019 .....	11
<b>2.1 Reported by animal type .....</b>	<b>11</b>
<b>2.2 Reported by project benefit .....</b>	<b>19</b>
<b>2.3 Number of animals used and animal deaths .....</b>	<b>26</b>
Part 3: Animal use statistics from 2010 to 2019 .....	28
<b>3.1 Number of animals used in research, teaching and testing 2010–2019 .....</b>	<b>28</b>
<b>3.2 Number of specified animals used, 2010–2019 .....</b>	<b>30</b>
4 Appendices .....	34
Appendix 1 .....	34



## List of tables

Table 2.1 Number of animals reported as used by animal type .....	11
Table 2.2 Number of animals reported as used by animal type and project purpose .....	13
Table 2.3 Number of non-specified animals used by animal type by source .....	16
Table 2.4 Number of specified animals used by animal type by source.....	18
Table 2.5 Number of animals reported as used by animal type, by project benefits .....	19
Table 2.6 Number of animals used, by project impact by project benefit .....	22
Table 2.7 Number of animals reported as used by project purpose .....	25
Table 2.8 Number of animals used and deaths by type .....	26
Table 3.1 Number of non-genetically modified specified animals in breeding colonies by animal type, 2010–2019 .....	32
Table 3.2 Number of genetically modified specified animals in breeding colonies by animal type 2010–2019 .....	32
Table 4.1 Reporting categories .....	34

## List of figures

Figure 3.1 Number of animals used 2010–2019.....	28
Figure 3.2 Percentage of animals used by project purpose, 2015–2019 .....	29
Figure 3.3 Percentage of animals used by impact type, 2015–2019.....	29
Figure 3.4 Number of specified mice used, 2010–2019 .....	30
Figure 3.5 Number of specified animals, excluding mice and non-human primates 2010-2019.....	31
Figure 3.6 Number of non-human primates 2010-2019.....	31
Figure 3.7 Number of specified mice in breeding colonies 2010–2019.....	33



## Executive Summary

In Victoria, the use of animals for scientific research, teaching and testing is regulated by the *Prevention of Cruelty to Animals Act 1986* (the Act). Organisations or individuals that conduct scientific procedures with animals must hold an authorising licence issued by Animal Welfare Victoria (AWV).

The Act also requires that the breeding of specified animals (guinea pigs, rabbits, rats, mice, and non-human primates) to be used in scientific procedures is authorised by a Specified Animals Breeding Licence. Licences are subject to conditions prescribed by the Prevention of Cruelty to Animals Regulations 2019.

Each year, licence holders are required to submit data on their use of animals. This report details the number and species of animals reported by licence holders for the period 1 January to 31 December 2019.

In this period, 3,294,755 animals were used under licence for scientific research, teaching and testing. This is a 43 per cent increase in animal use in 2019 compared to 2018, and 108 per cent above the 10-year average of 1,577,851 animals. Some of the increase can be explained by significantly larger numbers of poultry reported to have been used in 2019.

AWV had previously identified varying levels of understanding amongst licence holders regarding which animals were to be reported in the annual returns. In response, AWV reviewed the advice issued to licence holders and targeted accurate reporting of annual returns in its audit schedule of 2018. This action has continued to improve reporting compliance resulting in relatively higher numbers of animals reported than in previous years.

A large number of embryonated eggs were again reported separately in 2019. A licence holder used 82,250,208 embryonated eggs sourced from a commercial supplier in 2019 to generate vaccine. The scale of the use of embryonated eggs reflects the licence holder's role as the only onshore producer of influenza vaccines in Australia and as a significant supplier to the Northern Hemisphere.

In 2019, around 41 per cent of the non-specified animals reported as used for scientific purposes were privately owned animals on a farm, 31 per cent were sourced from their natural habitat and 25 per cent from a commercial supplier. For specified animals, 75 per cent were bred by the licence holders for their own supply, and 13 per cent were sourced from Victorian Specified Animal Breeding Licenced suppliers.

The most common impact on animals during research, teaching and testing was observational study involving minor interference (42 per cent), followed by minor conscious intervention (24 per cent) and minor physiological challenge (23 per cent). Less than one per cent of animals experienced death as an end point.

Following their use in research, teaching and testing, 37 per cent of animals were humanely euthanised. Poultry accounted for 55 per cent of animals euthanised.



## Introduction

Animals are used for research and discovery in many fields of science. The *Prevention of Cruelty to Animals Act 1986* (the Act) regulates their use in Victoria.

The use of animals for scientific research, teaching and testing is termed 'scientific procedures' by the Act and must only be conducted under a licence. Laboratory mice, rats, guinea pigs, rabbits and nonhuman primates are classed in the legislation as 'specified animals' and their commercial production and supply requires a separate licence (specified animal breeding licence).

AWV licences and monitors the scientific use of animals in Victoria. It safeguards the wellbeing of animals by assessing applications for licences to ensure they meet legislative requirements; monitoring compliance; providing advice on best practice procedures, housing and care; and providing training for Animal Ethics Committee (AEC) members. The Act requires animal use to be conducted under licence and overseen by an AEC.

The AEC is responsible for determining whether animal use is ethically justified and for ensuring that there are no available alternatives, prior to that use commencing. They weigh the predicted scientific or educational value of the projects against the potential effects on the welfare of the animals.

Each year, licence holders are required to submit data on their use of animals.

This report details the number and species of animals reported by licence holders for 2019. Research and teaching organisations report the number of animals they used for scientific procedures as well as any animals held in breeding colonies for in-house supply. Commercial producers of specified animals for the supply of research report the number of breeders and the number of stock animals produced.

This report includes information on where animals were sourced, the purpose and benefit of their use, the impact it had on their wellbeing, and whether or not they were killed at the conclusion of the project.

## Part 1: Guide to reading the report

### 1.1 The use of animals in research and teaching

#### 1.1.1 Why are animals still used for experiments?

Over time, many animal experiments have been replaced by valid alternative methods. The process of validation is complex and rigorous, to ensure reproducibility and accuracy. Unfortunately, not all research methods can be replaced at this time, but it is an ongoing endeavour. More information about replacement, reduction and refinement can be found at [www.nc3rs.org.uk](http://www.nc3rs.org.uk).

#### 1.1.2 What protections are in place?

Researchers and teachers must apply to an AEC for every project they conduct using animals. Before giving their approval, the AEC must be convinced that the animal use is justified. They weigh the predicted scientific or educational value of the projects against the potential effects on the welfare of the animals.

Applicants must demonstrate to the AEC that their project fulfils the principles of the three R's (Replacement, Reduction and Refinement):

1. Replacement: methods that either partially or completely replace the use of animals must be sought. The use of animals is prohibited if a valid, non-animal alternative exists.
2. Reduction: animal numbers must be statistically calculated to be the minimum necessary to achieve the results, and not so low as to render the exercise invalid.
3. Refinement: every effort must be made to minimise the impact on the animals involved, e.g. applying technology that allows an earlier conclusion to the study; ensuring best-practice anaesthesia and analgesia; by providing care and husbandry that meets the animal's psychological and physical needs.

AECs have a legal obligation to refuse to approve any project they consider unjustified or lacking scientific merit.

#### 1.1.3 Who is on an AEC?

There are four categories of membership on an AEC. At least one member of each category must be present to make a decision about a new project. The categories are:

- |            |   |
|------------|---|
| Category A | veterinarian.   |
| Category B | researcher or teacher with substantial and recent experience in the use of animals for scientific purposes relevant to the business of the AEC.   |
| Category C | person with demonstrable commitment to, and established experience in, furthering the welfare of animals, who is not employed by or otherwise associated with the institution, and who is not currently involved in the care and use of animals for scientific purposes.    |
| Category D | person not employed by or otherwise associated with the institution and who has never been involved in the use of animals in scientific or teaching activities, bringing a completely independent view to the AEC, and must not fit the requirements of any other category. |

## 1.2 Reporting process

### 1.2.1 How is the data collected?

Organisations and individuals licensed to use animals for research and teaching are responsible for providing the data to AWV by 31 March every year, for the previous calendar year.

### 1.2.2 Why is this data collected?

The reporting process collates data in the same areas that are the major considerations for the AEC when assessing an application. The broad outcomes of project purposes must be achieved by the more specific project benefits outlined in the application. The potential benefits are compared with the likely welfare impacts in a cost benefit analysis. Each member of the AEC must decide, according to their own judgement, if the project is justified in an ethical sense. This information informs policy decisions and is used to direct risk-based inspections and educational programs.

### 1.2.3 What types of animals are counted?

The types of animals counted in the statistics for research, testing or teaching projects are:

- mammals above the mid-point of gestation. This means that if research or teaching projects use a pregnant animal past the halfway point of gestation, she and all in utero offspring must be included in the statistics.
- birds and reptiles above the mid-point of incubation or gestation. This means eggs that are used for research or teaching must be reported in the statistics, if they are past the halfway point of incubation. For live bearing reptiles, the same rule applies as for mammals.
- fish and amphibians capable of independent feeding
- adult decapod crustaceans and cephalopods.

Reporting of breeding groups kept by scientific procedures and specified animal breeding licence holders is slightly different. The breeders, resting animals, and any offspring that have not been issued to a project must be reported.

### 1.2.4 Where are animals sourced from?

Specified animals must only be sourced from:

- Victorian suppliers holding a specified animals breeding licence
- an in-house breeding colony kept by a scientific procedures licence holder, or
- an interstate or overseas supplier who meets all relevant requirements of their local jurisdiction for the breeding of these animals

Other animals may be sourced from:

- an in-house breeding colony kept by a scientific procedures licence holder
- a commercial supplier
- private donation – this may include animals that continue to stay in the custody of the owners for the duration of the project (except farm animals)
- farms, where the animals do not leave the property
- their natural habitat – these animals may be sampled in the field and immediately released, or brought into captivity
- a captive colony or zoo



- a council pound – these animals must be treated in accordance with the Victorian code of practice for the use of animals from municipal pounds in scientific procedures, or
- another source, not specified above

### 1.2.5 What is meant by the project purpose?

Animals must only be used when there is no other alternative and only for a limited number of reasons. These are:

- to obtain and establish significant information relevant to the understanding of humans and/or animals, or
- to maintain and improve human and/or animal health and welfare, or
- to improve animal management or production, or
- to obtain and establish significant information relevant to the understanding, maintenance or improvement of the natural environment, or
- to achieve educational outcomes in science, as specified in the relevant curriculum or competency requirements

### 1.2.6 What is meant by the project benefit?

These categories refine and add definition to the broader project outcomes reported above. The reporting categories include:

- fundamental biology/physiology
- diseases - human
- diseases - animal
- diseases - zoonotic
- environmental monitoring/ecology
- domestic animal management/production
- wildlife management/conservation
- vertebrate pest management
- production of biological products
- development of techniques
- education
- training (student use of animals)
- regulatory product testing

### 1.2.7 What is meant by the impact of activities?

These reporting categories represent the highest level of impact experienced by the animal during its involvement in research, teaching or testing. An AEC must consider the wellbeing of animals used for scientific purposes in terms of the cumulative effects of an animal's lifetime experience. The categories are defined in Appendix 1.

### 1.2.8 What is meant by the number of deaths?

The fate of the animals at the conclusion of a project depends on the aims of the project. Some projects require analysis of the animal's tissues to conclude the experiment, and they are humanely killed to obtain these results. Occasionally, an unexpected adverse event, for example an unexpected reaction, surgical complication or unrelated illness will require an animal to be euthanised. Animals must be monitored with enough frequency to promptly detect any pain or distress, whether anticipated as a result of the study or not.



Animals may be reported as used but not recorded as dead because they have been, for example:

- captured then released back to the wild
- recruited to a study while kept in the care of their owner, for example on a farm or through a vet clinic
- rehomed at the conclusion of the project

## 1.3 Understanding the 2019 statistics

### 1.3.1 Why is the number of animals so much higher in 2019?

There was a 43 per cent increase in animal use in 2019 compared to 2018. Some of the increase can be explained by significantly larger numbers of poultry reported to have been used in 2019.

AWV identified varying levels of understanding amongst licence holders regarding which animals were to be reported in the annual returns. In response, AWV reviewed its advice to licence holders and targeted accurate reporting of annual returns in its audit schedule of 2018 and 2019. Subsequently, a large proportion of licence holders reported relatively higher numbers of animals than in previous years.

### 1.3.2 Why are 82,250,208 embryonated eggs reported in 2019?

In mid-2018, AWV conducted an audit of a licence holder and found that they had not previously reported embryonated eggs used for influenza and other vaccine production in the annual returns.

To generate vaccine, early-stage embryonated chicken eggs are seeded with the current seasonal strain of the flu virus. Viral replication occurs in the embryonated eggs. The eggs are then harvested in the days following the midpoint of their incubation period.

AWV directed the licence holder to rectify these non-compliances, resulting in the reporting of embryonated eggs in a distinct category from chickens from 2018 onwards. The scale of the use of embryonated eggs reflect the licence holder's role as the only onshore producer of influenza vaccines in Australia and as a significant supplier to the northern hemisphere.

### 1.3.3 Why are there fewer tables in the 2019 report than in previous years?

Reporting of "particular procedures" ceased in 2018. This category consisted of a few select procedures and referred to some outdated practices. The requirement to include this information in the annual returns was removed from 2019 onwards.

## Part 2: Number of animals reported as used in 2019

In 2019, a total of 3,294,755 animals were reported to be used for teaching, research, and testing (scientific procedures) in Victoria. The table below shows the number of animals used by type. There was a 43 per cent increase in animal use in 2019 compared to the reported 2,310,553 animals in 2018.

This total number of animals reported excludes the 82,250,208 embryonated eggs used in the production of influenza vaccines.

### 2.1 Reported by animal type

Table 2.1 Number of animals reported as used by animal type

Animal Type	Number of animals
*Guinea pig (lab)	4,223
*Macaques	100
*Marmosets	83
*Mouse (lab)	445,853
*Rabbit (lab)	1,221
*Rat (lab)	16,218
Amphibians	5,992
Bird exotic captive	42
Bird exotic wild	1,391
Bird native captive	612
Bird native wild	79,481
Bird other	70,580
Cats (non-wild)	465
Cats (wild)	436
Cattle (domestic)	11,616
Crustaceans	2,677
Dasyurids	1,106
Dogs (non-wild)	2,706
Dogs, foxes (wild)	682
Exotic feral mammal other	51
Exotic Zoo mammal	20
Ferret (lab)	517
Fish	810,689
Goats (domestic)	472
Horses (domestic)	1,088
Koalas	204
Lizards	3,219
Macropods	5,204
Monotremes	241

Animal Type	Number of animals
Native mammal other	3,365
Native Rats, Mice	1,910
Other domestic mammals	333
Pigs (domestic)	625
Possums, Gliders	2,689
Poultry	1,765,802
Rabbits (wild)	53
Rats (wild)	450
Reptile other	4
Seals, Sealions	2,302
Sheep (domestic)	48,704
Snakes	140
Whales, Dolphins	53
Wombats	253
Mouse (wild)	380
Turtles, tortoises	340
Laboratory mammal (non-specified)	163
<b>Total</b>	<b>3,294,755</b>

*\*Specified animals*



**Table 2.2 Number of animals reported as used by animal type and project purpose**

Animal Type	Educational objectives	Environmental objectives	Improve animal management/pr oduction	Maintenance/ improvement human/animal health/welfare	Understand human/animal biology	Total
*Guinea pig (lab)	196		24	3,836	167	<b>4,223</b>
*Macaques				42	58	<b>100</b>
*Marmosets				10	73	<b>83</b>
*Mouse (lab)	10,814		19,116	110,915	305,008	<b>445,853</b>
*Rabbit (lab)	135		40	904	142	<b>1,221</b>
*Rat (lab)	1,121		36	5,168	9,893	<b>16,218</b>
Amphibians	541	4,091		1	1,359	<b>5,992</b>
Bird exotic captive	42					<b>42</b>
Bird exotic wild	2	1,191			198	<b>1,391</b>
Bird native captive	13	45	192	12	350	<b>612</b>
Bird native wild	346	76,406			2,729	<b>79,481</b>
Bird other	38,255	1,423		27,978	2,924	<b>70,580</b>
Cats (non-wild)	335	25		71	34	<b>465</b>
Cats (wild)	3	433				<b>436</b>
Cattle (domestic)	3,396	20	6,654	1,398	148	<b>11,616</b>
Crustaceans	4	2,673				<b>2,677</b>
Dasyurids	82	996	17	11		<b>1,106</b>
Dogs (non-wild)	1,773	228	2	421	282	<b>2,706</b>

Animal Type	Educational objectives	Environmental objectives	Improve animal management/pr oduction	Maintenance/improvement human/animal health/welfare	Understand human/animal biology	Total
Dogs, foxes (wild)	9	673				682
Exotic feral mammal other	1	10		40		51
Exotic Zoo mammal				20		20
Ferret (lab)	1			462	54	517
Fish	1,313	718,384	7,171	2,398	81,423	810,689
Goats (domestic)	38			194	240	472
Horses (domestic)	277	20	113	521	157	1,088
Koalas	3	201				204
Lizards	130	1,181	28		1,880	3,219
Macropods	64	4,549		19	572	5,204
Monotremes	1	239	1			241
Native mammal other	184	3,125			56	3,365
Native Rats, Mice	100	1,810				1,910
Other domestic mammals	59	53		6	215	333
Pigs (domestic)	126	30	154	110	205	625
Possums, Gliders	102	2,544		40	3	2,689
Poultry	404		1,606,300	155,570	3,528	1,765,802
Rabbits (wild)	49	4				53
Rats (wild)	313	121	14	2		450
Reptile other	4					4

Animal Type	Educational objectives	Environmental objectives	Improve animal management/pr oduction	Maintenance/ improvement human/animal health/welfare	Understand human/animal biology	Total
Seals, Sealions		1,609		693		<b>2,302</b>
Sheep (domestic)	24,146	244	13,663	9,763	888	<b>48,704</b>
Snakes	6	91			43	<b>140</b>
Whales, Dolphins		40			13	<b>53</b>
Wombats	1	252				<b>253</b>
Mouse (wild)	185	194		1		<b>380</b>
Turtles, tortoises	3	330	7			<b>340</b>
Laboratory mammal (non-specified)				17	146	<b>163</b>
<b>Total</b>	<b>84,577</b>	<b>823,235</b>	<b>1,653,532</b>	<b>320,623</b>	<b>412,788</b>	<b>3,294,755</b>

*\*Specified animals.*



**Table 2.3 Number of non-specified animals used by animal type by source**

Animal Type	Australian captive colony/zoo	Commercial supplier	Municipal pound	Other source	Own Derivation	Private donation	Privately owned animals on a farm	Removed from Aust. natural habitat	Total
Amphibians	25	275		2	131			5,559	<b>5,992</b>
Bird exotic captive				40		2			<b>42</b>
Bird exotic wild								1,391	<b>1,391</b>
Bird native captive	211	13			356			32	<b>612</b>
Bird native wild	36				20			79,425	<b>79,481</b>
Bird other	33	29,178		80	798			40,491	<b>70,580</b>
Cats (non-wild)		7	58	146	47	162	14	31	<b>465</b>
Cats (wild)								436	<b>436</b>
Cattle (domestic)		1,125		2,244	718	243	7,286		<b>11,616</b>
Crustaceans								2,677	<b>2,677</b>
Dasyurids	217							889	<b>1,106</b>
Dogs (non-wild)		8	14	1,263	39	880	116	386	<b>2,706</b>
Dogs, foxes (wild)								682	<b>682</b>
Exotic feral mammal other		40						11	<b>51</b>
Exotic Zoo mammal	20								<b>20</b>
Ferret (lab)		516			1				<b>517</b>
Fish	531	23,805		138	68,590		49	717,576	<b>810,689</b>
Goats (domestic)		240		15			217		<b>472</b>
Horses (domestic)		97		307	174	73	417	20	<b>1,088</b>



Animal Type	Australian captive colony/zoo	Commercial supplier	Municipal pound	Other source	Own Derivation	Private donation	Privately owned animals on a farm	Removed from Aust. natural habitat	Total
Koalas								204	<b>204</b>
Lizards	216	8		16	167			2,812	<b>3,219</b>
Macropods	19				170			5,015	<b>5,204</b>
Monotremes	1							240	<b>241</b>
Native mammal other	4							3,361	<b>3,365</b>
Native Rats, Mice	74							1,836	<b>1,910</b>
Other domestic mammals		6		59	215			53	<b>333</b>
Pigs (domestic)		224			143		228	30	<b>625</b>
Possums, Gliders	12			7				2,670	<b>2,689</b>
Poultry		637,137		177	11,458		1,117,030		<b>1,765,802</b>
Rabbits (wild)							46	7	<b>53</b>
Rats (wild)							46	404	<b>450</b>
Reptile other				4					<b>4</b>
Seals, Sealions								2,302	<b>2,302</b>
Sheep (domestic)		1,966		96	1,895		44,747		<b>48,704</b>
Snakes				5			43	92	<b>140</b>
Whales, Dolphins								53	<b>53</b>
Wombats								253	<b>253</b>
<b>Total</b>	<b>1,399</b>	<b>694,645</b>	<b>72</b>	<b>4,599</b>	<b>84,922</b>	<b>1,360</b>	<b>1,170,239</b>	<b>868,938</b>	<b>2,826,174</b>



**Table 2.4 Number of specified animals used by animal type by source**

Animal Type	*Other	*Own Derivation	*Imported from overseas	*Victoria – Specified Animals Breeding Licenced Supplier	*Interstate institution authorised to distribute specified animals	<b>Total</b>
*Guinea pig (lab)	139	3,980		61	43	<b>4,223</b>
*Macaques		73		27		<b>100</b>
*Marmosets		10		73		<b>83</b>
*Mouse (lab)	4,267	338,637	1,306	56,390	45,253	<b>445,853</b>
*Rabbit (lab)	67	906		160	88	<b>1,221</b>
*Rat (lab)	1,370	5,095	91	5,012	4,650	<b>16,218</b>
<b>Total</b>	<b>5,843</b>	<b>348,701</b>	<b>1,397</b>	<b>61,723</b>	<b>50,034</b>	<b>467,698</b>

\*Specified animals.

## 2.2 Reported by project benefit

Table 2.5 Number of animals reported as used by animal type, by project benefits

Animal Type	Development of techniques	Domestic animal management/production	Education (demonstration)	Environmental monitoring/ecology	Fundamental biology/physiology	Production of biological products	Regulatory product testing	Training (student use of animals)	Vertebrate pest management	Wildlife management/conservation	Diseases-animal	Diseases-zoonotic	Diseases-human	Non-specified Animal Breeding Colony group	Total
*Guinea pig (lab)	41		128		174	48	3	68			1,184		2,577		<b>4,223</b>
*Macaques					7	1							92		<b>100</b>
*Marmosets					71								12		<b>83</b>
*Mouse (lab)	284	16,190	882		159,463	480	97	10,243	20		11,015	1,537	244,990	652	<b>445,853</b>
*Rabbit (lab)	38		13			140	64	122			745		99		<b>1,221</b>
*Rat (lab)	46	36	341		6,027	136	62	787	20		22		8,741		<b>16,218</b>
Amphibians			421	2,840	1,201			147		1,157	225		1		<b>5,992</b>
Bird exotic captive								42							<b>42</b>
Bird exotic wild			2							1,389					<b>1,391</b>
Bird native captive					350					234	28				<b>612</b>
Bird native wild			263	63,620	1,116			83	338	12,812	189	1,060			<b>79,481</b>
Bird other			251	39,794	768		27,978	113		476			1,200		<b>70,580</b>
Cats (non-wild)	9	6	17	16	51	13		318	9		4	15	7		<b>465</b>
Cats (wild)			3	156					72	205					<b>436</b>
Cattle (domestic)	10	4,792	139	20	9	169	899	3,451			2,121	6			<b>11,616</b>
Crustaceans			4	2,673											<b>2,677</b>
Dasyurids			15	322				56		702	11				<b>1,106</b>
Dogs (non-wild)	123	1	51	8	152	38	1	1,585		220	323	204			<b>2,706</b>

Animal Type	Development of techniques	Domestic animal management/production	Education (demonstration)	Environmental monitoring/ecology	Fundamental biology/physiology	Production of biological products	Regulatory product testing	Training (student use of animals)	Vertebrate pest management	Wildlife management/conservation	Diseases-animal	Diseases-zoonotic	Diseases-human	Non-specified Animal Breeding Colony group	Total
Dogs, foxes (wild)			9	424						249					<b>682</b>
Exotic feral mammal other		40	1	4						6					<b>51</b>
Exotic Zoo mammal					6						14				<b>20</b>
Ferret (lab)	12				38			1				104	362		<b>517</b>
Fish	436	6,740	512	705,675	79,022			962	1,980	13,513	152		1,697		<b>810,689</b>
Goats (domestic)		240	31				1	7			193				<b>472</b>
Horses (domestic)	14	140	20	20	173	12	20	249			393	4	43		<b>1,088</b>
Koalas			3	53						148					<b>204</b>
Lizards			32	1,019	1,731			82		355					<b>3,219</b>
Macropods			28	4,090	375			36	42	633					<b>5,204</b>
Monotremes			1	153						87					<b>241</b>
Native mammal other			73	568				169	7	2,548					<b>3,365</b>
Native Rats, Mice			30	989				58		833					<b>1,910</b>
Other domestic mammals			17	53	215	6		42							<b>333</b>
Pigs (domestic)	20	174	17	30	42	6	4	91			38	60	143		<b>625</b>
Possums, Gliders			87	980				10	12	1,567	17	16			<b>2,689</b>
Poultry		1,116,737	253		2,182	15,496	489,252	151			5,789	9,189	126,753		<b>1,765,802</b>
Rabbits (wild)			49	2						2					<b>53</b>
Rats (wild)			313	18					54	63	2				<b>450</b>

Animal Type	Development of techniques	Domestic animal management/production	Education (demonstration)	Environmental monitoring/ecology	Fundamental biology/physiology	Production of biological products	Regulatory product testing	Training (student use of animals)	Vertebrate pest management	Wildlife management/conservation	Diseases-animal	Diseases-zoonotic	Diseases-human	Non-specified Animal Breeding Colony group	Total
Reptile other			4												4
Seals, Sealions				50						2,252					2,302
Sheep (domestic)	1,778	15,284	315	200	575	1,708	365	23,811			2,525	1,307	836		48,704
Snakes			4	85	43			1		7					140
Whales, Dolphins										53					53
Wombats				252						1					253
Mouse (wild)			180	112				5		82	1				380
Turtles, tortoises			2	330				1		7					340
Laboratory mammal (non-specified)					146								17		163
<b>Total</b>	<b>2,811</b>	<b>1,160,380</b>	<b>4,511</b>	<b>824,556</b>	<b>253,937</b>	<b>18,253</b>	<b>518,746</b>	<b>42,691</b>	<b>2,554</b>	<b>39,601</b>	<b>24,991</b>	<b>13,502</b>	<b>387,570</b>	<b>652</b>	<b>3,294,755</b>

\*Specified animals.



**Table 2.6 Number of animals used, by project impact by project benefit**

Project Impact	Development of techniques	Domestic animal management/production	Education (demonstration)	Environmental monitoring/ecology	Fundamental biology/physiology	Production of biological products	Regulatory product testing	Training (student use of animals)	Vertebrate pest management	Wildlife management/conservation	Diseases-animal	Diseases-zoonotic	Diseases-human	Non-specified Animal Breeding Colony group	Total
*Specified Animal Breeding Colony group (non-GM)					130								48		<b>178</b>
*Specified Animal Breeding Colony group (established GM line)					3,736								852		<b>4,588</b>
Non-specified Animal Breeding Colony group (non-GM)				17		485							225		<b>727</b>
Non-specified Animal Breeding Colony group (established GM line)													882		<b>882</b>

Project Impact	Development of techniques	Domestic animal management/production	Education (demonstration)	Environmental monitoring/ecology	Fundamental biology/physiology	Production of biological products	Regulatory product testing	Training (student use of animals)	Vertebrate pest management	Wildlife management/conservation	Diseases-animal	Diseases-zoonotic	Diseases-human	Non-specified Animal Breeding Colony group	Total
Observational study involving minor interference	1,840	1,124,106	2,833	132,886	32,121	159	184	26,906	1,759	15,663	1,070	9,975	26,719		<b>1,376,221</b>
Animal unconscious without recovery	318	5,932	886	6,573	62,060	13,206	29,505	1,388	716	69	1,798	340	62,553		<b>185,344</b>
Minor conscious intervention	231	28,587	559	641,145	40,164	1,098	944	12,969	10	11,051	11,022	1,899	49,418	652	<b>799,749</b>
Minor operative procedures with recovery	76	12	12	29	23,370	310		1,236	17	526	635	16	15,204		<b>41,443</b>
Minor physiological challenge	221	1,631	203	43,906	48,604	2,290	487,933	85		12,211	2,233	432	143,382		<b>743,131</b>
Surgery with recovery	125	92	1		7,368	49	88	77		73	737		34,567		<b>43,177</b>
Moderate to major		20	17		36,384	460	92	30	52	8	4,751	840	51,891		<b>94,545</b>

Project Impact	Development of techniques	Domestic animal management/production	Education (demonstration)	Environmental monitoring/ecology	Fundamental biology/physiology	Production of biological products	Regulatory product testing	Training (student use of animals)	Vertebrate pest management	Wildlife management/conservation	Diseases-animal	Diseases-zoonotic	Diseases-human	Non-specified Animal Breeding Colony group	Total
physiological challenge															
Death as an end point						196					2,745		1,829		<b>4,770</b>
<b>Total</b>	<b>2,811</b>	<b>1,160,380</b>	<b>4,511</b>	<b>824,556</b>	<b>253,937</b>	<b>18,253</b>	<b>518,746</b>	<b>42,691</b>	<b>2,554</b>	<b>39,601</b>	<b>24,991</b>	<b>13,502</b>	<b>387,570</b>	<b>652</b>	<b>3,294,755</b>





**Table 2.7 Number of animals reported as used by project purpose**

Project purpose	Number of animals
Educational objectives	84,577
Environmental objectives	823,235
Improve animal management/production	1,653,532
Maintenance/improvement human/animal health/welfare	320,623
Understand human/animal biology	412,788
<b>Total</b>	<b>3,294,755</b>

## 2.3 Number of animals used and animal deaths

Investigators must plan for animals at the conclusion of a project. If appropriate, animals are returned to normal husbandry conditions or their natural habitat. When results rely on tissue analysis, this usually requires the humane killing of the animals. Opportunities to rehome animals that are not needed for tissue analysis are considered wherever possible. Under certain conditions, with special justification, an AEC may approve an animal to be used in a subsequent project.

**Table 2.8 Number of animals used and deaths by type**

Animal type	Number of animals	Number of deaths
*Guinea pig (lab)	4,223	3,995
*Macaques	100	38
*Marmosets	83	42
*Mouse (lab)	445,853	381,674
*Rabbit (lab)	1,221	1,018
*Rat (lab)	16,218	15,215
Amphibians	5,992	811
Bird exotic captive	42	0
Bird exotic wild	1,391	0
Bird native captive	612	145
Bird native wild	79,481	187
Bird other	70,580	29,287
Cats (non-wild)	465	54
Cats (wild)	436	1
Cattle (domestic)	11,616	414
Crustaceans	2,677	87
Dasyurids	1,106	8
Dogs (non-wild)	2,706	0
Dogs, foxes (wild)	682	0
Exotic feral mammal other	51	40
Exotic Zoo mammal	20	0
Ferret (lab)	517	477
Fish	810,689	106,501
Goats (domestic)	472	8
Horses (domestic)	1,088	12
Koalas	204	1
Lizards	3,219	676
Macropods	5,204	357
Monotremes	241	0
Native mammal other	3,365	2
Native Rats, Mice	1,910	9
Other domestic mammals	333	223
Pigs (domestic)	625	279

Possums, Gliders	2,689	31
Poultry	1,765,802	665,204
Rabbits (wild)	53	0
Rats (wild)	450	55
Reptile other	4	0
Seals, Sealions	2,302	1
Sheep (domestic)	48,704	4,071
Snakes	140	2
Whales, Dolphins	53	0
Wombats	253	0
Mouse (wild)	380	1
Turtles, tortoises	340	0
Laboratory mammal (non-specified)	163	106
<b>Total</b>	<b>3,294,755</b>	<b>1,211,032</b>

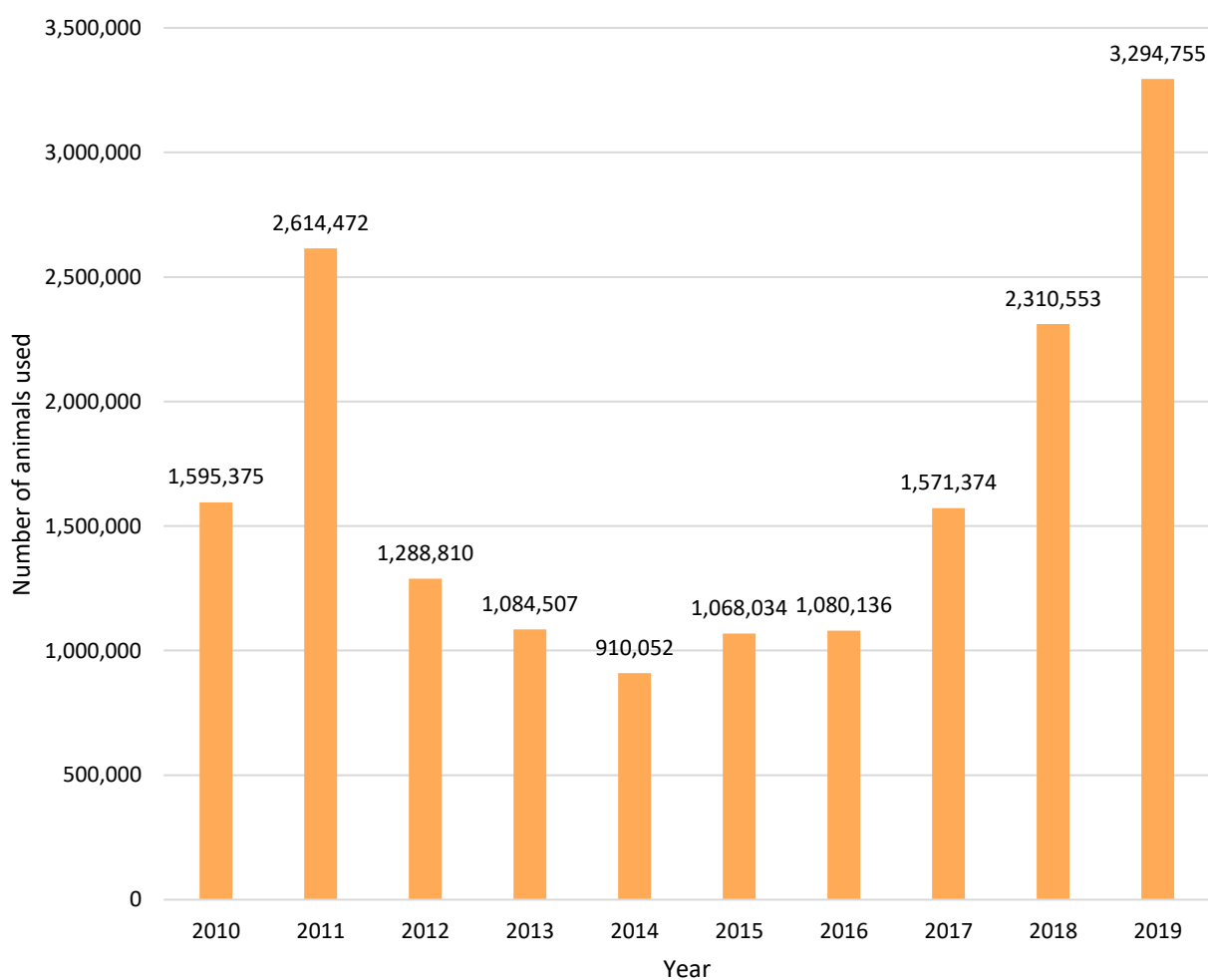
*\*Specified animals.*

## Part 3: Animal use statistics from 2010 to 2019

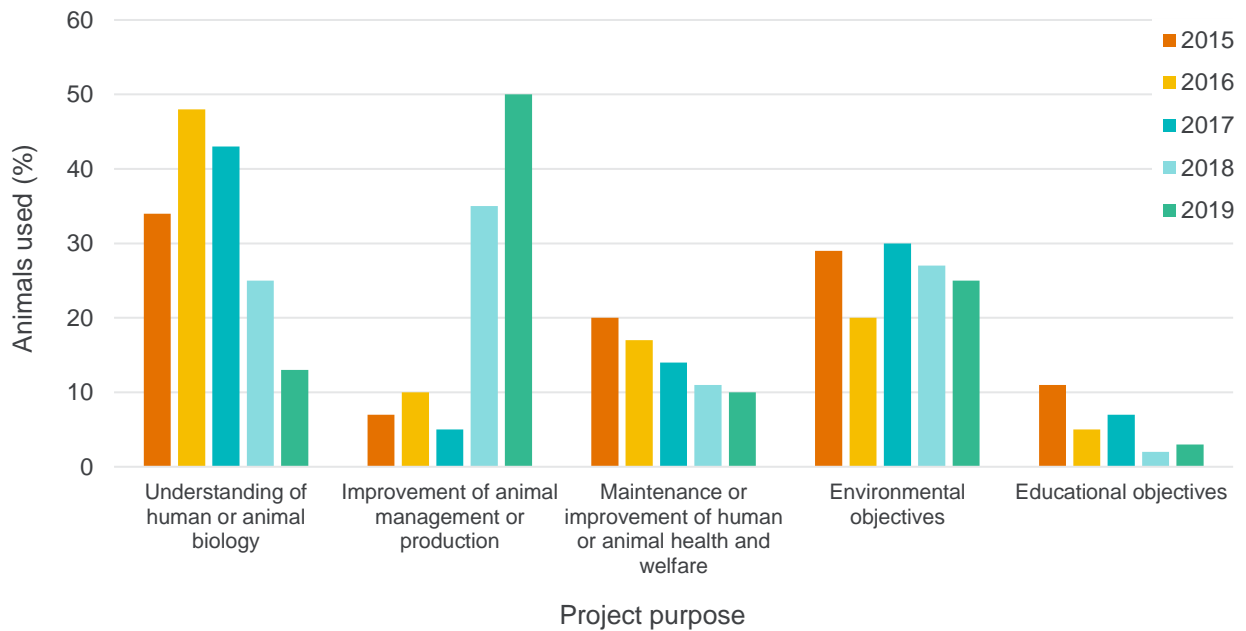
### 3.1 Number of animals used in research, teaching and testing 2010–2019

The number of animals used in research, teaching and testing in 2019 was 3,294,755.

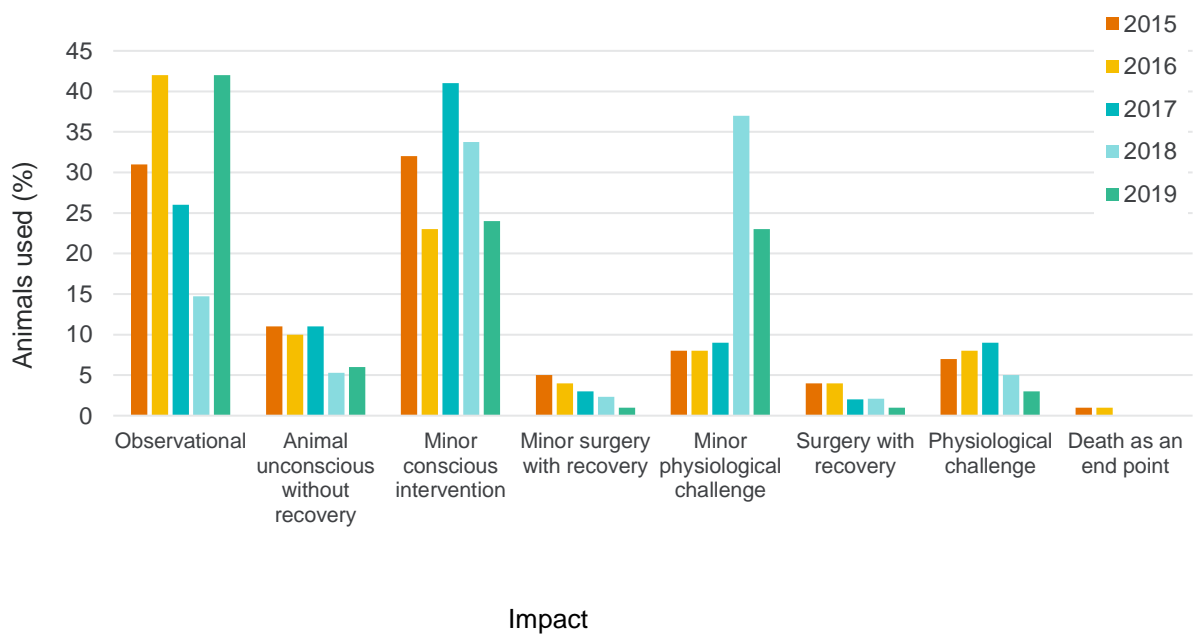
Figure 3.1 Number of animals used 2010–2019



**Figure 3.2 Percentage of animals used by project purpose, 2015–2019**

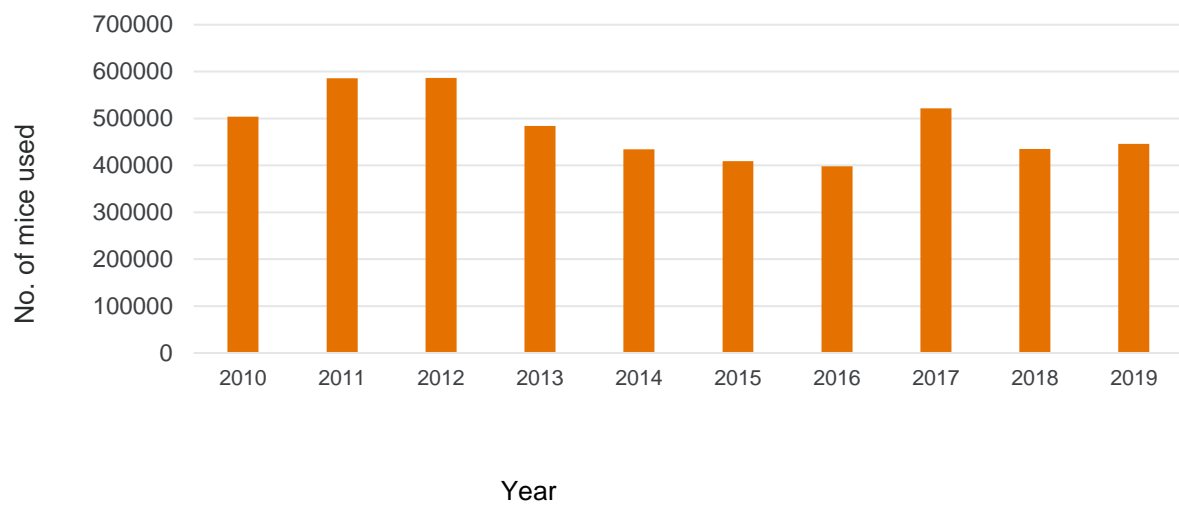


**Figure 3.3 Percentage of animals used by impact type, 2015–2019**

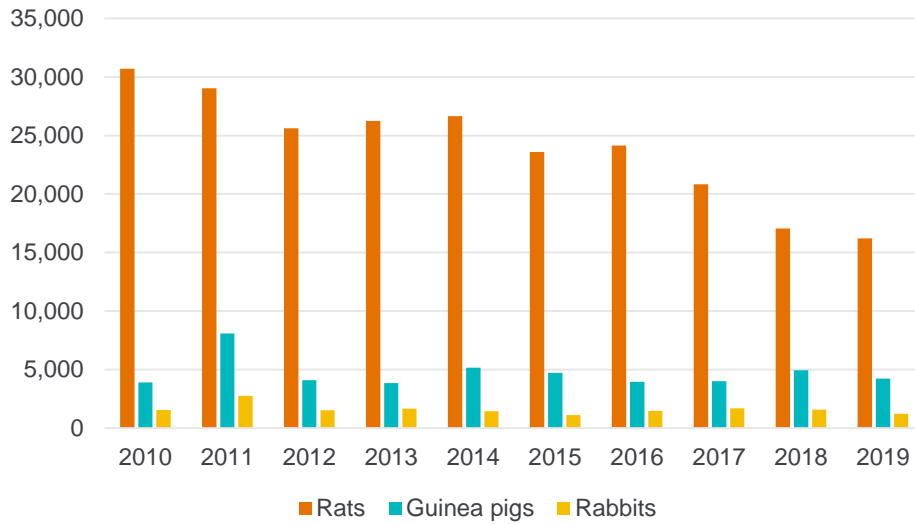


### 3.2 Number of specified animals used, 2010–2019

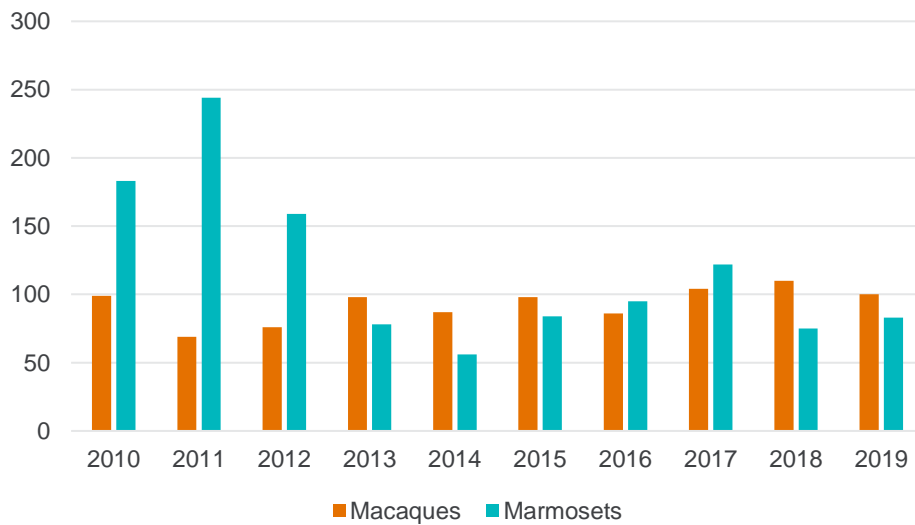
Figure 3.4 Number of specified mice used, 2010–2019



**Figure 3.5 Number of specified animals, excluding mice and non-human primates 2010-2019**



**Figure 3.6 Number of non-human primates 2010-2019**



**Table 3.1 Number of non-genetically modified specified animals in breeding colonies by animal type, 2010–2019**

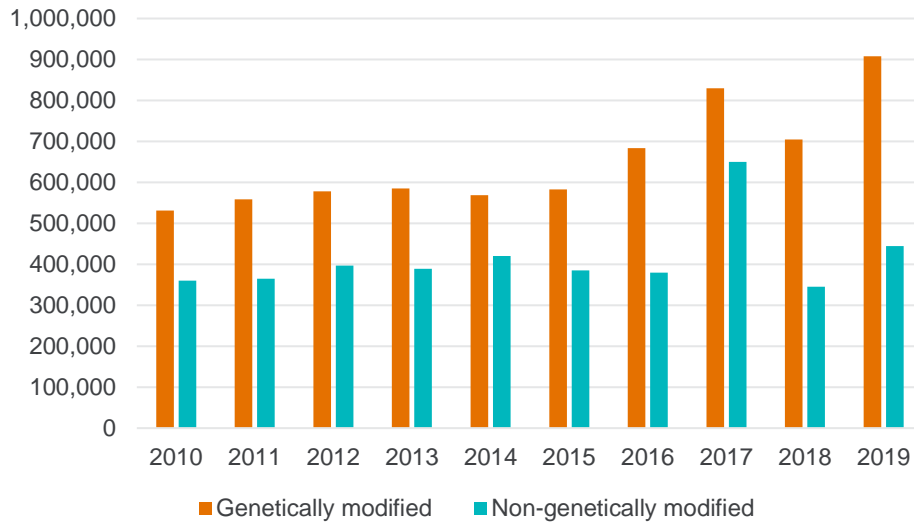
Animal type	Year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Guinea pigs	1,153	388	320	244	345	294	96	48	3,202	1,543
Macaques	243	250	244	226	263	282	274	476	258	271
Marmosets	177	156	146	273	305	440	463	744	309	228
Mice	360,185	365,009	396,710	389,049	420,126	384,762	379,198	644,519	345,107	444,733
Rabbits	445	489	214	197	133	179	159	86	793	46
Rats	52,786	48,543	31,886	33,308	25,546	23,744	27,754	40,719	20,606	28,319
<b>Total</b>	<b>414,989</b>	<b>414,835</b>	<b>429,520</b>	<b>423,297</b>	<b>446,718</b>	<b>409,701</b>	<b>407,944</b>	<b>691,592</b>	<b>370,275</b>	<b>475,140</b>

**Table 3.2 Number of genetically modified specified animals in breeding colonies by animal type 2010–2019**

Animal type	Year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Mice	531,098	558,293	578,240	584,660	568,495	582,925	683,769	829,940	704,297	908,083
Rats	1,146	1,744	1,381	1,992	4,271	2,714	2,286	2,907	2,160	2,073
<b>Total</b>	<b>532,244</b>	<b>560,037</b>	<b>579,621</b>	<b>586,652</b>	<b>572,766</b>	<b>585,639</b>	<b>686,055</b>	<b>832,847</b>	<b>706,457</b>	<b>910,156</b>



**Figure 3.7 Number of specified mice in breeding colonies 2010–2019**



## 4 Appendices

### Appendix 1

Table 4.1 Reporting categories

Category	Description
Observation involving minor interference	Studies in which the normal activities of animals are minimally impacted on. For example, laboratory animals held in cages for acclimatization; a feeding trial, such as Digestible Energy determination of feed in a balanced diet; behavioural or growth study with minor environmental manipulation; or teaching of normal, non-invasive husbandry such as handling, grooming, etc.
Unconscious without recovery	Studies in which animals are humanely rendered unconscious under controlled circumstances (i.e. not in a field situation) with as little pain or distress as possible. Capture methods are not required. Any pain is minor and brief and does not require analgesia. Procedures are carried out on the unconscious animal that is then killed without regaining consciousness. Examples include animals (including fish) in laboratory killed painlessly for dissection, biochemical analysis, etc.; or teaching of surgical techniques using live, anaesthetised patients that are not allowed to recover following the procedure
Minor conscious intervention	Studies in which animals are subjected to minor procedures that would normally not require anaesthesia. Any pain is minor, although some distress may occur as a result of trapping or handling. For example, capture and release (with or without tagging) of animals (including fish) in the wild; trapping and humane euthanasia for collection of specimens; ear notching for identification of new line GM animals; injections, blood sampling in conscious animal; minor dietary or environmental deprivation or manipulation, such as feeding nutrient-deficient diets for short periods; or stomach tubing, branding, disbudding, shearing, etc.
Minor operative procedure with recovery	Studies in which animals are anaesthetised for a minor procedure such as cannulation or skin biopsy. Animals are allowed to recover. Depending on the procedure, pain may be minor or moderate and post-operative analgesia may be appropriate. For example, biopsies or blood sampling under anaesthesia or sedation; cannulations under anaesthesia or sedation; sedation/anaesthesia for relocation, examination or injections/blood sampling; field capture using chemical restraint methods.

Category	Description
Minor physiological challenge	Studies in which there is interference with the animals' physiological or psychological processes. The challenge may cause mild or short-lived pain/distress, or any pain/distress is quickly and effectively alleviated. For example, electrofishing; minor infection, minor or moderate phenotypic modification, early oncogenesis; arthritis studies with pain alleviation; prolonged deficient diets, induction of metabolic disease; polyclonal antibody production; or antiserum production.
Surgery with recovery	Studies in which animals are anaesthetised for a major procedure such as abdominal or orthopaedic surgery following which the animal is allowed to recover. Post-operative pain should be managed with analgesia. For example, orthopaedic surgery; abdominal or thoracic surgery; transplant surgery; or surgery under anaesthesia for implantation of telemetry tags
Moderate to major physiological challenge	Studies in which there is interference with the animals' physiological or psychological processes. The procedure/s may cause moderate or longer lasting pain/distress. Pain or distress may not be able to be entirely alleviated, either due to the nature of the process (e.g., neurological impairment) or because of the experimental question (e.g., pain studies). Other examples include: severe infection, significant disability due to genetic modification, induction of cancer without pain alleviation; arthritis studies without pain alleviation, uncontrolled metabolic disease; isolation or environmental deprivation for extended periods.
Death as an endpoint	Studies where the death of the animal is essential for the scientific result, such as for efficacy of some antivenoms, development of pest control agents and studies of acutely fatal conditions. In these studies, death is a deliberate measure in the procedure and there can be no intervention to kill the animal humanely before death occurs in the course of the procedure. 'Death as an endpoint' procedures must be approved by the Minister for Agriculture. They do not include studies where animals are humanely killed at the conclusion of the experiment.