Statistics of animal use in research and teaching, Victoria

1 January 2023 – 31 December 2023

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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.

The Act also requires that the breeding of specified animals (guinea pigs, rats, mice, rabbits, 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 2023.

In this period, 2,063,816 animals were used under licence for scientific research, teaching and testing. This is a 59% decrease in animal use in 2023 compared to 2022, and 0.84% below the 10-year average of 2,081,246 animals. This decrease is primarily due to a single project concluding in 2022 that used approximately 3.65 million poultry sourced from a commercial supplier. The number of animals reported fluctuates each year due to variables such as changes to the focus of funded projects, technological advances, and economic factors.

A total of 42,929,498 embryonated eggs were reported in 2023. This is a 31% decrease in embryonated egg use in 2023 compared to 2022. These embryonated eggs are reported distinct from other animal use given the scale, and, as the category was first reported in 2018, to prevent the skewing of historical data. The embryonated eggs were primarily used for vaccine production.

In 2023, around 56% of the non-specified animals reported as used for scientific purposes were used in their natural habitat, 34% were sourced from a commercial supplier, and 5% from own derivation. For specified animals, 63% were bred by the licence holders for their own supply, 21% were sourced from interstate institutions authorised to distribute specified animals and 14% 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 (61%), followed by minor conscious intervention (16%) and minor physiological challenge (10%). Less than 1% of animals experienced death as an end point.

Following their use in research, teaching and testing, 26% of animals were humanely 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 non-human primates are classed in the legislation as ‘specified animals’ and their commercial production and supply requires a separate licence (specified animal breeding licence).

Animal Welfare Victoria licenses and monitors the scientific use of animals in Victoria. It safeguards the well-being 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 a 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 2023. 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 well-being, and whether they were killed at the conclusion of the project or not.

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.

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 3 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 Animal Ethics Committee?

There are 4 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 Animal Welfare Victoria 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, teaching or testing projects are:

- Mammals at and above the mid-point of gestation. This means that if research or teaching projects use a pregnant animal at or past the halfway point of gestation, she and all in utero offspring must be included in the statistics.
- Birds and reptiles at and 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 at or 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 number of animals used as breeders and the number of stock animals produced 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 well-being 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 2023 statistics

1.3.1 How does the number of animals used compare to previous years?

There was a 59% decrease in animal use in 2023 compared to 2022. This decrease is primarily due to a single project concluding in 2022 that used approximately 3.65 million poultry sourced from a commercial supplier. These animals were used for regulatory product testing, for the purposes of improving animal management/ production.

The number of animals reported fluctuates each year due to variables such as changes to the focus of funded projects, technological advances, and economic factors.

1.3.2 Why are 42,929,498 embryonated eggs reported in 2023?

A total of 42,929,498 embryonated eggs were reported in 2023. This is a 31% decrease in embryonated egg use in 2023 compared to 2022. These embryonated eggs are reported distinct from other animal use given the scale, and as the category was first reported in 2018, to prevent the skewing of historical data. The embryonated eggs were primarily used for vaccine production.

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.

Part 2: Number of animals reported as used in 2023

In 2023, a total of 2,063,816 animals were reported to be used for research, teaching and testing (scientific procedures) in Victoria. The table below shows the number of animals used by type. There was a 59% decrease in animal use in 2023 compared to the reported 5,092,001 animals used in 2022.

This total number of animals reported excludes 42,929,498 embryonated eggs. All of these eggs were sourced from a commercial supplier. These eggs were primarily used for 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)	4,543
*Macaques	119
*Marmosets	74
*Mouse (lab)	502,311
*Rabbit (lab)	1,211
*Rat (lab)	11,529
Amphibians	19,984
Bird exotic captive	50
Bird exotic wild	648
Bird native captive	595
Bird native wild	400,895
Bird other	5,157
Cats (non-wild)	302
Cats (wild)	154
Cattle (domestic)	21,447
Cephalopods	135
Crustaceans	27,167
Dasyurids	1,752
Deer (domestic)	85
Dogs (non-wild)	2,366
Dogs, foxes (wild)	2,104
Exotic feral mammal other	481
Exotic Zoo mammal	6
Ferret (lab)	427
Fish	298,724
Goats (domestic)	872
Goats (wild)	200
Hares (wild)	15
Horses (domestic)	999
Koalas	1,348
Lizards	7,196

Animal type	Number of animals
Macropods	19,801
Mice (wild)	3,067
Monotremes	429
Native mammal other	70,263
Native Rats, Mice	9,891
Other domestic mammals	54
Pigs (domestic)	11,235
Pigs (wild)	18
Possums, Gliders	8,309
Poultry	518,310
Rabbits (wild)	1,654
Rats (wild)	63,260
Reptile other	490
Seals, Sealions	1,114
Sheep (domestic)	37,640
Snakes	922
Tortoises/turtle	2,396
Whales, dolphins	690
Wombats	1,377
Total	**2,063,816**

**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/ production	Maintenance/ improvement human/animal health/welfare	Understand human/animal biology	**Total**
*Guinea pig (lab)	92		11	4,375	65	**4,543**
*Macaques				16	103	**119**
*Marmosets				11	63	**74**
*Mouse (lab)	16,465		30,718	131,764	323,364	**502,311**
*Rabbit (lab)	90			930	191	**1,211**
*Rat (lab)	644		148	4,849	5,888	**11,529**
Amphibians	714	16,953	1,659		658	**19,984**
Bird exotic captive	50					**50**
Bird exotic wild	17	604	1		26	**648**
Bird native captive	29	83			483	**595**
Bird native wild	3,995	183,375	6	713	212,806	**400,895**
Bird other	15	5,000		140	2	**5,157**
Cats (non-wild)	132		28	138	4	**302**
Cats (wild)	1	153				**154**
Cattle (domestic)	3,470	300	7,058	10,619		**21,447**
Cephalopods		28	107			**135**
Crustaceans	3,460	11,271	11,385		1,051	**27,167**
Dasyurids	186	1,456	90	9	11	**1,752**
Deer (domestic)		84		1		**85**
Dogs (non-wild)	1,136	1,140	18	67	5	**2,366**
Dogs, foxes (wild)	10	2,069		25		**2,104**

Animal Type	Educational objectives	Environmental objectives	Improve animal management/ production	Maintenance/ improvement human/animal health/welfare	Understand human/animal biology	**Total**
Exotic feral mammal other		110	105	266		**481**
Exotic Zoo mammal				6		**6**
Ferret (lab)				206	221	**427**
Fish	889	210,875	15,061	518	71,381	**298,724**
Goats (domestic)	219		653			**872**
Goats (wild)		200				**200**
Hares (wild)		15				**15**
Horses (domestic)	192	8		767	32	**999**
Koalas		1,345	1	2		**1,348**
Lizards	85	6,556	58	121	376	**7,196**
Macropods	171	16,105	11	3,005	509	**19,801**
Mice (wild)	8	2,518	248	48	245	**3,067**
Monotremes		403	16	2	8	**429**
Native mammal other	64	69,534	35	217	413	**70,263**
Native Rats, Mice	401	9,490				**9,891**
Other domestic mammals	32			22		**54**
Pigs (domestic)	95		8,001	3,103	36	**11,235**
Pigs (wild)		18				**18**
Possums, Gliders	103	8,117	10	17	62	**8,309**
Poultry	543		473,163	43,134	1,470	**518,310**
Rabbits (wild)		1,654				**1,654**
Rats (wild)	7	52,628	10,625			**63,260**

Animal Type	Educational objectives	Environmental objectives	Improve animal management/ production	Maintenance/ improvement human/animal health/welfare	Understand human/animal biology	**Total**
Reptile other	1	447		3	39	**490**
Seals, Sealions		167		119	828	**1,114**
Sheep (domestic)	33,140	75	551	3,713	161	**37,640**
Snakes	76	743		92	11	**922**
Tortoises/turtle	5	2,147		8	236	**2,396**
Whales, dolphins		690				**690**
Wombats		1,370		7		**1,377**
Total	**66,537**	**607,731**	**559,767**	**209,033**	**620,748**	**2,063,816**

**Specified animals.*

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

Animal Type	Animals in their natural habitat	Australian captive colony/zoo	Commercial supplier	Other source	Own derivation	Private companion animals	Private donation	Privately owned animals on a farm	Removed from Aust. natural habitat	**Total**
Amphibians	16,562	1,937	518		131				836	**19,984**
Bird exotic captive							50			**50**
Bird exotic wild	622								26	**648**
Bird native captive		91	29		453		22			**595**
Bird native wild	400,817	78								**400,895**
Bird other	5,000		140	2		15				**5,157**
Cats (non-wild)			11	127		164				**302**
Cats (wild)	153					1				**154**
Cattle (domestic)	131		2,177	652	2,545		19	15,923		**21,447**
Cephalopods	135									**135**
Crustaceans	24,513	1,540							1,114	**27,167**
Dasyurids	1,615	59			78					**1,752**
Deer (domestic)	84					1				**85**
Dogs (non-wild)	1,129	2		10	2	1,205		18		**2,366**
Dogs, foxes (wild)	2,040	25						39		**2,104**
Exotic feral mammal other	215				266					**481**
Exotic Zoo mammal		6								**6**
Ferret (lab)			427							**427**
Fish	220,228	43	8,535	1,113	65,716	10			3,079	**298,724**
Goats (domestic)				206				666		**872**

Animal Type	Animals in their natural habitat	Australian captive colony/zoo	Commercial supplier	Other source	Own derivation	Private companion animals	Private donation	Privately owned animals on a farm	Removed from Aust. natural habitat	**Total**
Goats (wild)	200									**200**
Hares (wild)	15									**15**
Horses (domestic)	12		119	27	33	156	73	579		**999**
Koalas	1,346								2	**1,348**
Lizards	7,027		21	8		88	1		51	**7,196**
Macropods	19,643				153				5	**19,801**
Mice (wild)	2,723		96						248	**3,067**
Monotremes	415	13							1	**429**
Native mammal other	70,242								21	**70,263**
Native Rats, Mice	9,778	95				11			7	**9,891**
Other domestic mammals			30	16		8				**54**
Pigs (domestic)			242	50	10,868		2	73		**11,235**
Pigs (wild)	18									**18**
Possums, Gliders	8,298								11	**8,309**
Poultry			515,952	197	2,000	72	58	31		**518,310**
Rabbits (wild)	1,654									**1,654**
Rats (wild)	63,260									**63,260**
Reptile other	464	15							11	**490**
Seals, Sealions	1,114									**1,114**
Sheep (domestic)			1,770	1,369	1,220	22	45	33,214		**37,640**
Snakes	811	2	19	4		63	2		21	**922**

Animal Type	Animals in their natural habitat	Australian captive colony/zoo	Commercial supplier	Other source	Own derivation	Private companion animals	Private donation	Privately owned animals on a farm	Removed from Aust. natural habitat	**Total**
Tortoises/turtle	2,361		3				2		30	**2,396**
Whales, dolphins	690									**690**
Wombats	1,370	1		4					2	**1,377**
Total	**864,685**	**3,907**	**530,089**	**3,785**	**83,465**	**1,816**	**274**	**50,543**	**5,465**	**1,544,029**

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

Animal Type	*Other	*Own Derivation	*Imported from overseas	*Interstate institution authorised to distribute specified animals	*Victoria – Specified Animals Breeding Licenced Supplier	**Total**
*Guinea pig (lab)	45	4,397		65	36	**4,543**
*Macaques	2				117	**119**
*Marmosets					74	**74**
*Mouse (lab)	5,670	320,387	3,485	105,997	66,772	**502,311**
*Rabbit (lab)	272	835		71	33	**1,211**
*Rat (lab)	147	2,726		2,564	6,092	**11,529**
Total	**6,136**	**328,345**	**3,485**	**108,697**	**73,124**	**519,787**

**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-human	Diseases-zoonotic	**Total**
*Guinea pig (lab)	42		34		45	11	3,983	58				370		**4,543**
*Macaques					4	76						39		**119**
*Marmosets					56	7						11		**74**
*Mouse (lab)	549		1,265	12	235,292	1,693	11,582	15,200			7,773	227,796	1,149	**502,311**
*Rabbit (lab)						203	646	90				272		**1,211**
*Rat (lab)	35		145		5,517	81		499			139	5,113		**11,529**
Amphibians			502	12,147	58			212	377	6,319	369			**19,984**
Bird exotic captive								50						**50**
Bird exotic wild				558	26			17		47				**648**
Bird native captive	3				483			29		80				**595**
Bird native wild			3,720	234,214	794			275		161,649			243	**400,895**
Bird other					2			15		5,000	140			**5,157**
Cats (non-wild)		124	6		2			126			34	10		**302**
Cats (wild)				68				1		85				**154**
Cattle (domestic)		13,247	8	171				3,462		129	4,430			**21,447**
Cephalopods				28						107				**135**
Crustaceans			3,460	7,734						15,973				**27,167**
Dasyurids				566	11			186		932	57			**1,752**

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-human	Diseases-zoonotic	**Total**
Deer (domestic)	1			82						2				**85**
Dogs (non-wild)	38	8	24	12	6			1,112		1,130	36			**2,366**
Dogs, foxes (wild)				1,197				10		897				**2,104**
Exotic feral mammal other				80					105	30		266		**481**
Exotic Zoo mammal										4			2	**6**
Ferret (lab)					66							329	32	**427**
Fish		6,504	820	194,419	44,666			69	229	29,730		22,287		**298,724**
Goats (domestic)		415	12					207			238			**872**
Goats (wild)										200				**200**
Hares (wild)				2						13				**15**
Horses (domestic)	4	12	6	5	32	64	25	186		3	662			**999**
Koalas				823						523	2			**1,348**
Lizards			13	4,557	2			72		2,402	70		80	**7,196**
Macropods			70	9,155	509			101		6,961	3,005			**19,801**
Mice (wild)				680				8	311	1,972		96		**3,067**
Monotremes				181						247	1			**429**
Native mammal other			15	26,509				49		43,452	238			**70,263**
Native Rats, Mice			88	1,714				313		7,776				**9,891**
Other domestic mammals			16			22		16						**54**

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-human	Diseases-zoonotic	**Total**
Pigs (domestic)	76	10,886	23			47	24	72				26	81	**11,235**
Pigs (wild)				18										**18**
Possums, Gliders			45	2,460				58		5,729	17			**8,309**
Poultry	528	41,869	210		1,470	979	470,738	333			1,674	472	37	**518,310**
Rabbits (wild)				264						1,390				**1,654**
Rats (wild)				51,617				7	10,625	1,011				**63,260**
Reptile other		3		443	39			1		4				**490**
Seals, Sealions				2						1,112				**1,114**
Sheep (domestic)	94	482	6,802	75	637	17	346	26,338			159	2,690		**37,640**
Snakes			12	562				64		194	25		65	**922**
Tortoises/turtle			2	719	176			3		1,496				**2,396**
Whales, dolphins										690				**690**
Wombats				1,248						122	7			**1,377**
Total	**1,370**	**73,550**	**17,298**	**552,322**	**289,893**	**3,200**	**487,344**	**49,239**	**11,647**	**297,411**	**19,076**	**259,777**	**1,689**	**2,063,816**

**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-human	Diseases-zoonotic	**Total**
Observational study involving minor interference	105	60,328	5,374	358,849	51,311		466,861	29,523	10,964	243,485	4,249	22,895		**1,253,944**
Animal unconscious without recovery	180	85	955	3,595	38,514	1,090		1,598		10,340	1,511	31,385		**89,253**
Minor conscious intervention	80	5,693	10,964	143,998	56,950	919	753	15,445	425	28,506	8,903	63,487	947	**337,070**
Minor operative procedures with recovery	8	6,606		219	23,902	336	8	848		404	221	33,250	32	**65,834**
Minor physiological challenge	779	790		45,206	89,706	329	5,314	1,666	246	12,218	2,062	41,458	702	**200,476**
Surgery with recovery	218	18	5	455	10,778	3	5	117		9	600	19,252		**31,460**
Moderate to major physiological challenge		30			18,732	523	9,949	42	12	2,449	1,530	47,588	8	**80,863**
Death as an end point							4,454					462		**4,916**
Total	**1,370**	**73,550**	**17,298**	**552,322**	**289,893**	**3,200**	**487,344**	**49,239**	**11,647**	**297,411**	**19,076**	**259,777**	**1,689**	**2,063,816**

Table 2.7 Number of animals reported as used by project purpose

Project purpose	Number of animals
Educational objectives	66,537
Environmental objectives	607,731
Improve animal management/production	559,767
Maintenance/improvement human/animal health/welfare	209,033
Understand human/animal biology	620,748
Total	**2,063,816**

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)	4,543	4,464
*Macaques	119	14
*Marmosets	74	39
*Mouse (lab)	502,311	438,351
*Rabbit (lab)	1,211	974
*Rat (lab)	11,529	10,498
Amphibians	19,984	1,532
Bird exotic captive	50	0
Bird exotic wild	648	26
Bird native captive	595	257
Bird native wild	400,895	19
Bird other	5,157	142
Cats (non-wild)	302	12
Cats (wild)	154	0
Cattle (domestic)	21,447	73
Cephalopods	135	3
Crustaceans	27,167	2,118
Dasyurids	1,752	14
Deer (domestic)	85	0
Dogs (non-wild)	2,366	3
Dogs, foxes (wild)	2,104	2
Exotic feral mammal other	481	82
Exotic Zoo mammal	6	0
Ferret (lab)	427	328
Fish	298,724	66,431
Goats (domestic)	872	35
Goats (wild)	200	0
Hares (wild)	15	0
Horses (domestic)	999	2
Koalas	1,348	8
Lizards	7,196	25
Macropods	19,801	158
Mice (wild)	3,067	101
Monotremes	429	0
Native mammal other	70,263	27

Animal type	Number of animals	Number of deaths
Native Rats, Mice	9,891	15
Other domestic mammals	54	3
Pigs (domestic)	11,235	1,179
Pigs (wild)	18	6
Possums, Gliders	8,309	7
Poultry	518,310	10,415
Rabbits (wild)	1,654	0
Rats (wild)	63,260	1
Reptile other	490	11
Seals, Sealions	1,114	2
Sheep (domestic)	37,640	2,963
Snakes	922	3
Tortoises/turtle	2,396	52
Whales, dolphins	690	0
Wombats	1,377	0
Total	**2,063,816**	**540,395**

**Specified animals.*

Part 3: Animal use statistics from 2014 to 2023

3.1 Number of animals used in research, teaching and testing from 2014 – 2023

The number of animals used in research, teaching and testing in 2023 was 2,063,816.

Figure 3.1 Number of animals used, 2014 - 2023

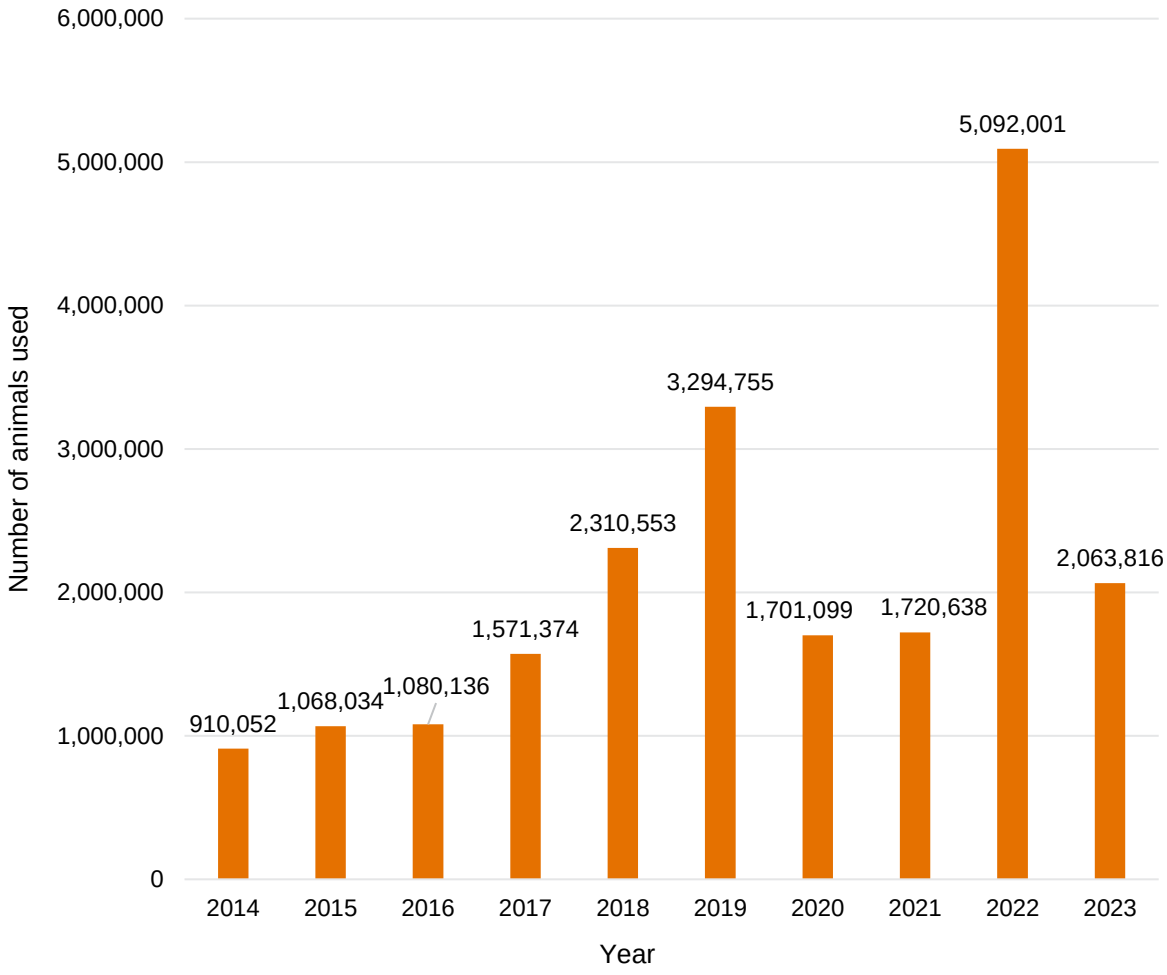


Figure 3.2 Percentage of animals used by project purpose, 2019 – 2023

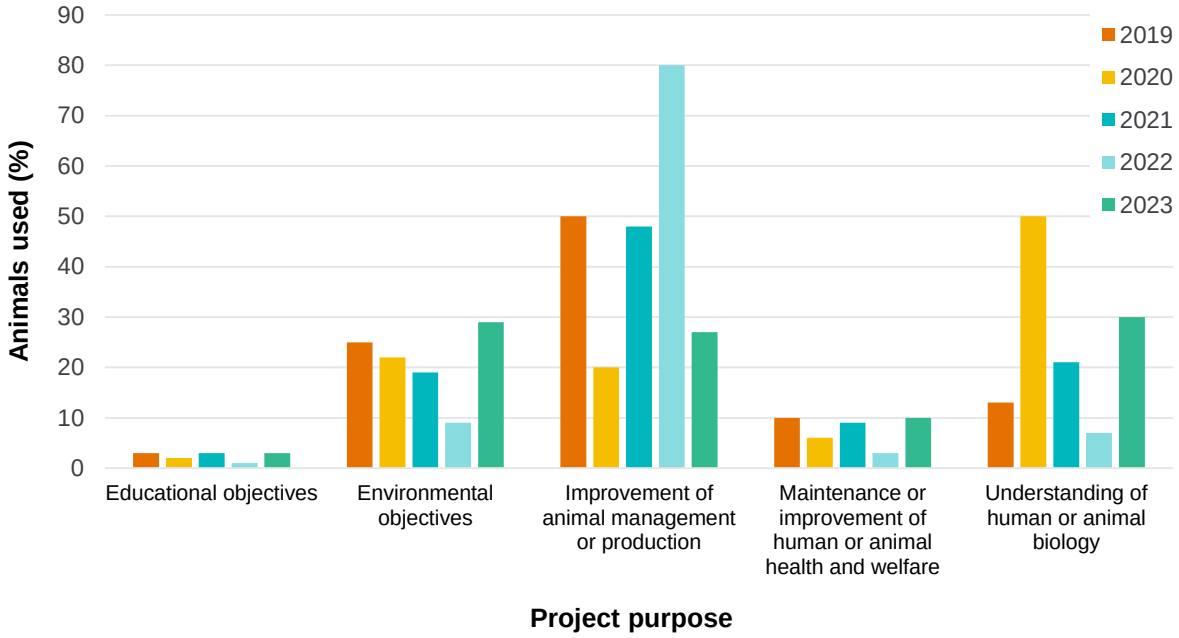
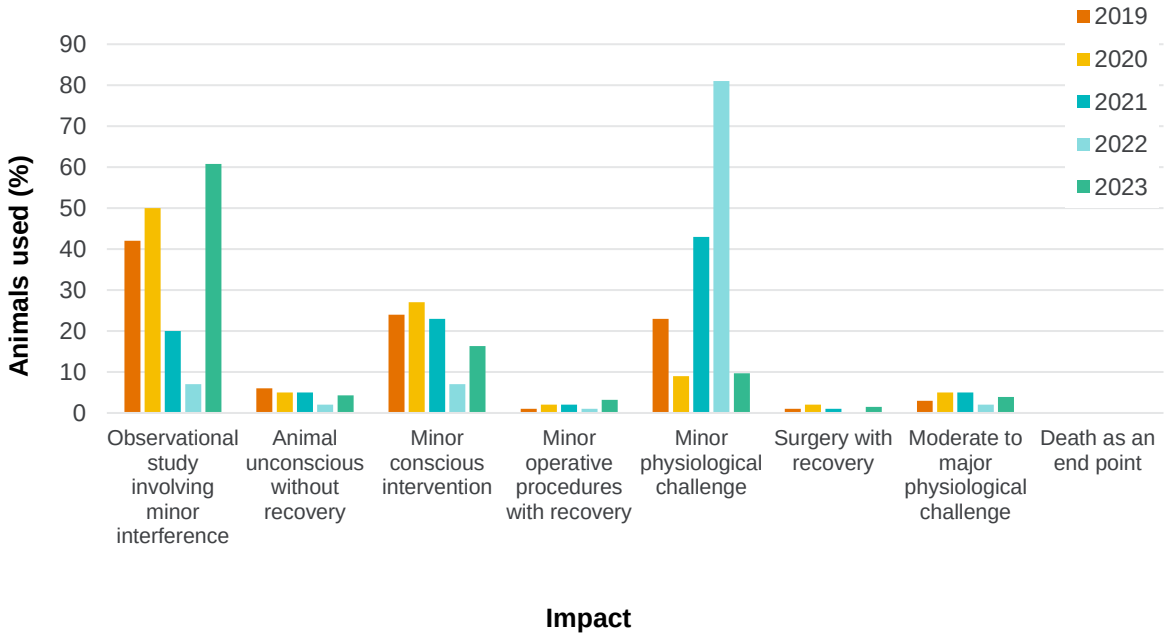


Figure 3.3 Percentage of animals used by impact type, 2019 – 2023



Note: Less than 0.6% of animals experienced death as an endpoint each year over the last 5 years.

3.2 Number of specified animals used from 2014 – 2023

Figure 3.4 Number of specified mice used, 2014 – 2023

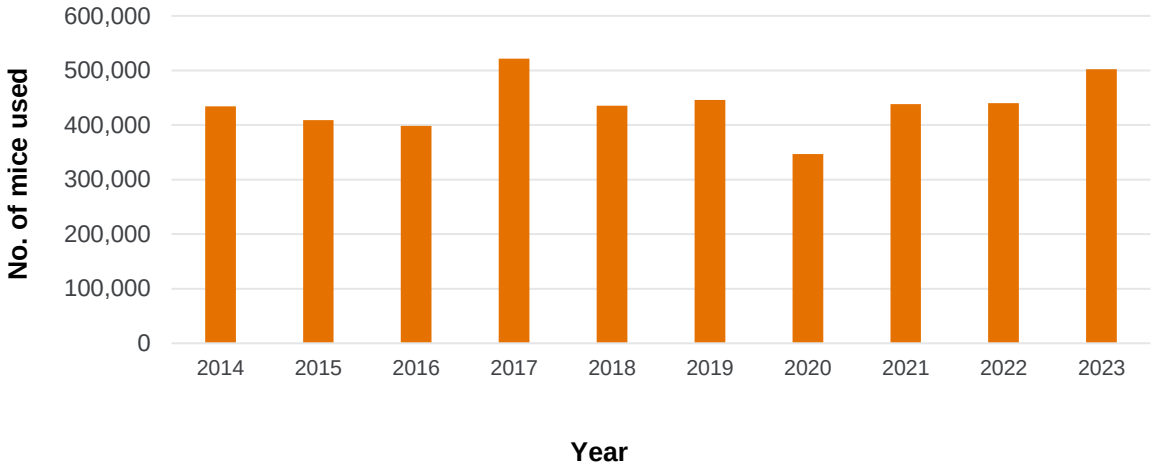


Figure 3.5 Number of specified animals, excluding mice and non-human primates 2014 – 2023

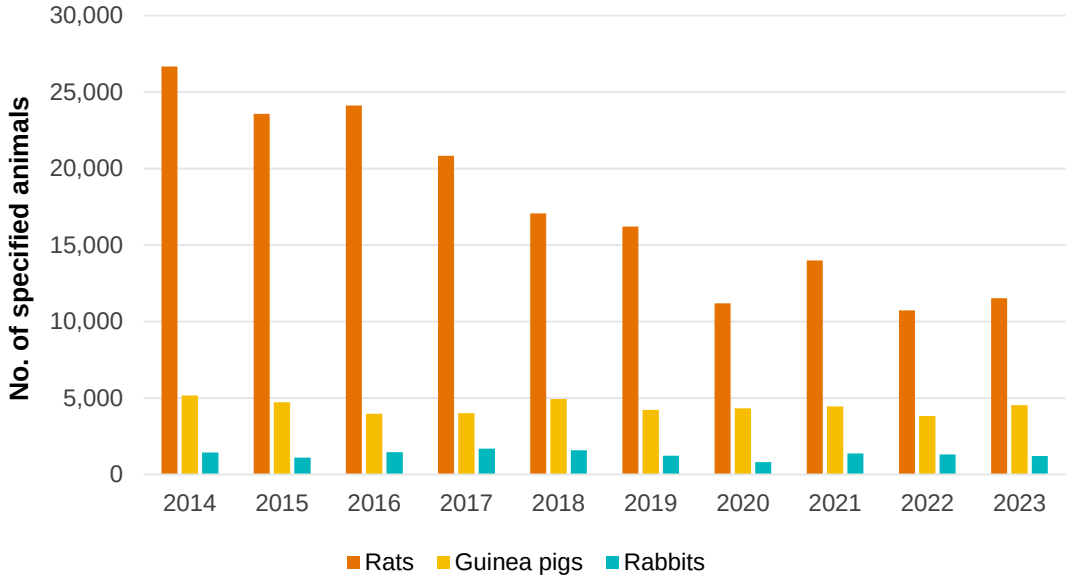


Figure 3.6 Number of non-human primates, 2014 – 2023

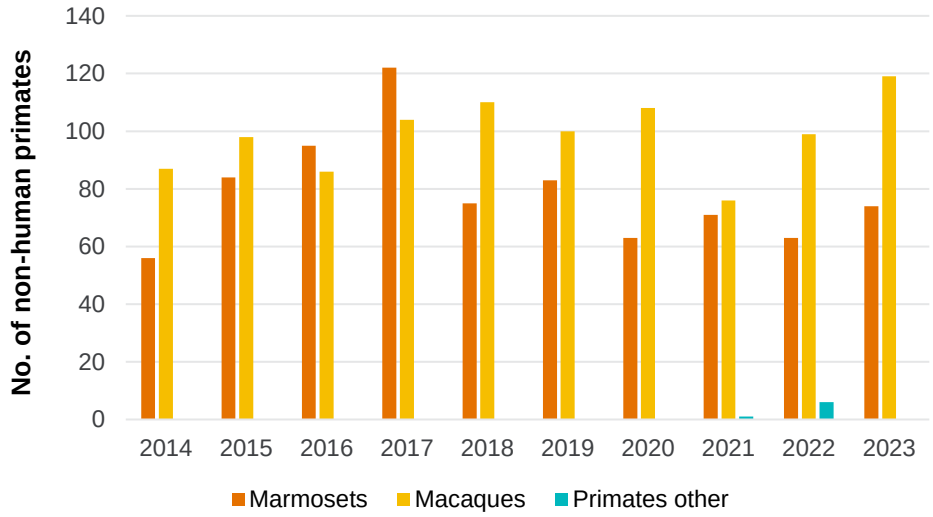
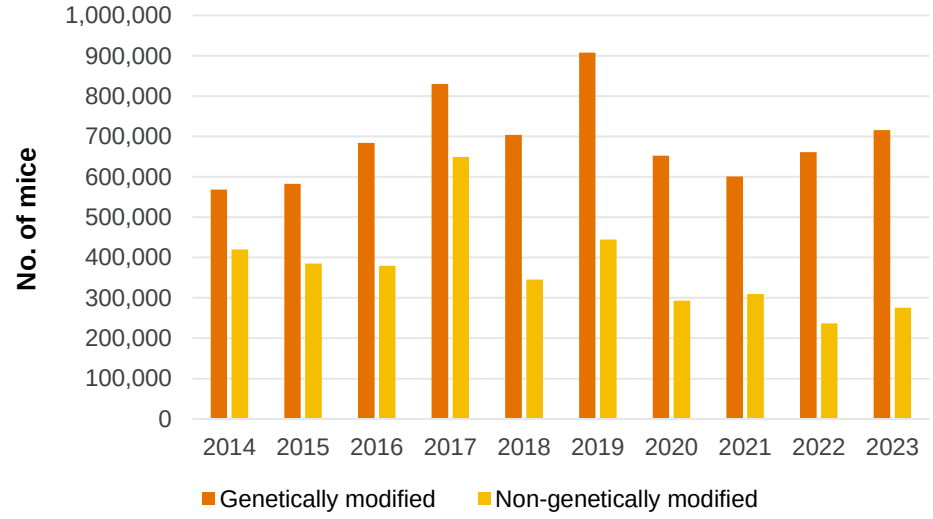


Figure 3.7 Number of specified mice in breeding colonies, 2014 – 2023



3.3 Number of animals used in breeding colonies from 2014 – 2023

Table 3.1 Number of non-genetically modified specified animals in breeding colonies by animal type, 2014 – 2023

Animal type	Year									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Guinea pigs	345	294	96	48	3,202	1,543	1,207	2,183	1,344	2,327
Macaques	263	282	274	476	258	271	175	158	175	195
Marmosets	305	440	463	744	309	228	231	210	228	188
Mice	420,126	384,762	379,198	649,519	345,107	444,733	292,840	309,679	237,073	275,978
Rabbits	133	179	159	86	793	46	531	540	1,370	1,328
Rats	25,546	23,744	27,754	40,719	20,606	28,319	24,089	30,040	23,561	21,119
Total	**446,718**	**409,701**	**407,944**	**691,592**	**370,275**	**475,140**	**319,073**	**342,810**	**263,751**	**301,135**

Table 3.2 Number of genetically modified specified animals in breeding colonies by animal type, 2014 – 2023

Animal type	Year									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Mice	568,495	582,925	683,769	829,940	704,297	908,083	652,671	600,716	661,064	716,196
Rats	4,271	2,714	2,286	2,907	2,160	2,073	1,408	1,570	1,383	2,699
Total	**572,766**	**585,639**	**686,055**	**832,847**	**706,457**	**910,156**	**654,079**	**602,286**	**662,447**	**718,895**

In 2020 a new reporting category was introduced, to capture non-specified animals in breeding colonies. This was designed to improve data accuracy for these animals. Previously, these animals may have been reported as domestic animal management/production.

Table 3.3 Number of non-genetically modified non-specified animals in breeding colonies by animal type, 2020 - 2023

Animal type	2020	2021	2022	2023
Amphibians	274	287	1,846	123
Bird native captive	0	31	23	0
Bird other	0	0	23	0
Cats (non-wild)	21	58	25	29
Cattle (domestic)	338	0	0	0
Dasyurids	8	0	0	0
Exotic feral mammal other	393	99	84	0
Fish	87,636	38,340	12,536	158,257
Horses (domestic)	19	52	29	72
Lizards	0	0	16	0
Macropods	53	100	42	35
Native Rats, Mice	0	0	33	0
Poultry	52	337	434	383
Reptile other	0	12	6	0
Sheep (domestic)	1,136	230	258	134
Laboratory mammal (non-specified)	344	707	0	0
Total	**90,274**	**40,253**	**15,355**	**159,033**

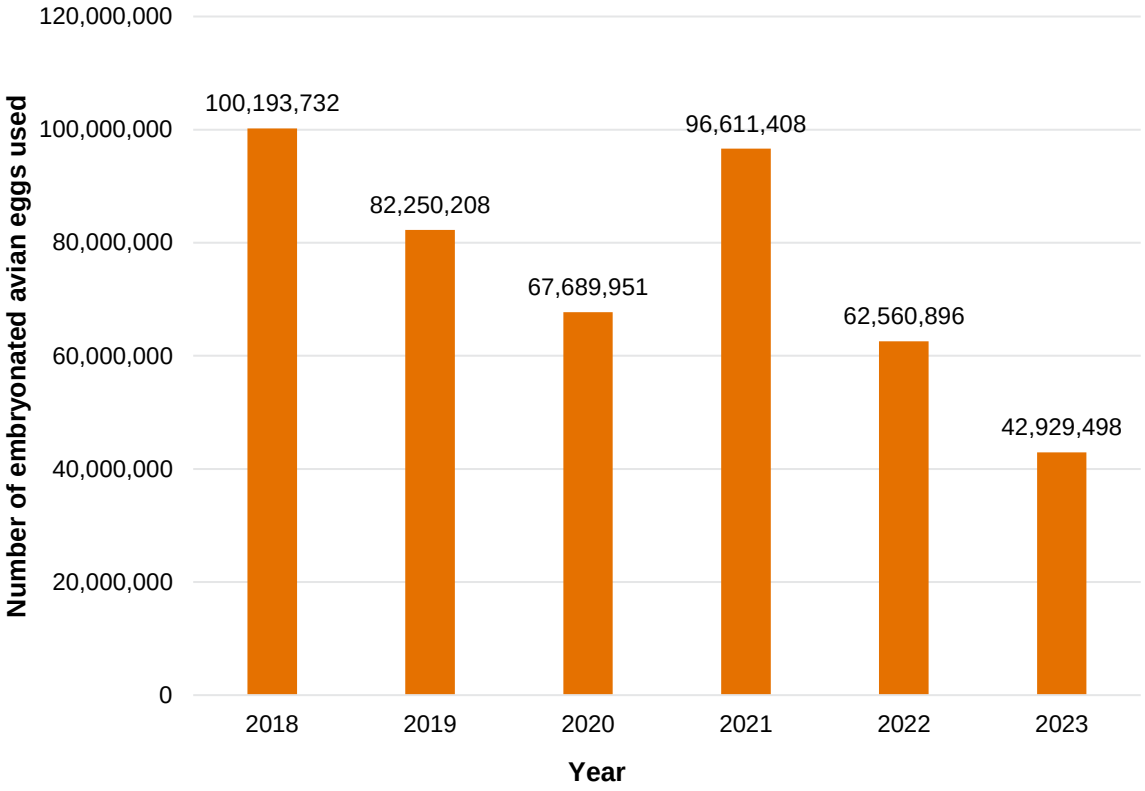
Table 3.4 Number of genetically modified non-specified animals in breeding colonies by animal type, 2020 - 2023

Animal type	2020	2021	2022	2023
Amphibians	175	67	0	0
Bird other	34	0	0	0
Fish	59,248	196,335	174,710	68,362
Pigs (domestic)	55	0	0	0
Poultry	270	441	65	0
Laboratory mammal (non-specified)	0	0	558	0
Total	**59,782**	**196,843**	**175,333**	**68,362**

3.4 Number of embryonated avian eggs used in research, teaching and testing from 2018 – 2023

The number of embryonated avian eggs used in research, teaching and testing in 2023 was 42,929,498.

Figure 3.8 Number of embryonated avian eggs used, 2018 – 2023



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 acclimatisation; 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.
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

Category	Description
	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.