ANIMAL WELFARE VICTORIA

Statistics of animal use in research and teaching, Victoria

1 January 2017 – 31 December 2017
Report No. 35

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

June 2019

© Copyright State Government of Victoria 2018. This publication is copyright. No part may be reproduced by any process except in accordance with provisions of the Copyright Act 1968.

Authorised by the Victorian Government, Melbourne.

Print Managed by Finsbury Green

ISBN 978-1-76090-130-1 **(pdf/online/MS word)**

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

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.

Table of Contents

Introduction **6**
PART 1 NUMBER OF ANIMALS REPORTED AS USED IN 2017 ..... **7**
1.1 Number of Animals Reported as Used, by Animal Type **7**
1.2 Number of Animals Used, by Animal Type and Project Purpose **9**
1.2.1 Animals Used to Understand Human / Animal Biology 13
1.2.2 Animals Used to Achieve Environmental Purposes 14
1.2.3 Animals Used for Improvement of Human / Animal Health / Welfare 15
1.2.4 Animals Used to Achieve Educational Purposes 16
1.2.5 Animals Used for Improvement of Animal Management / Production 17
1.3 Number of Animals Used by Animal Type by Source **18**
1.4 Number of Animals Used, by Animal Type by Procedure Type **21**
1.4.1 Number of Animals Used by Procedure and by Project Purpose 25
1.4.2 Number of Animals Used by Procedure Type and Procedure Impact 27
1.4.3 Number of Animals Used by Procedure Type and Procedure Benefit 29
1.5 Number of Animals Used, by Animal Type by Project Benefit **31**
1.5.1 Number of Animals Used, by Project Impact by Project Benefit 35
1.6 Number of Animals Used and Animal Deaths **36**
PART 2 ANIMAL USE STATISTICS FROM 2007 TO 2017 ..... **39**
2.1 Number of Animals Used, 2007–2017 ..... **39**
2.1.1 Animals Used in Scientific Procedures 39
2.2 Number of Specified Animals Used, 2007–2017 ..... **40**
2.2.1. Number of Specified Mice Used, 2007–2017 40
2.2.2 Number of Specified Animals Excluding Mice and Non-human Primates, 2007 – 2017 41
2.2.3 Number of Specified Primates, 2007 – 2017 41
2.3 Number of Animals Used in Genetic Modification Procedures and Number of Projects **42**
2.4 Number of Specified Animals in Breeding Colonies, by Animal Type, 2007–2017 ..... **42**
2.5 Number of Licences and Projects **43**

List of Tables

Table 1.1 Number of Animals Reported as Used by Animal Type 7
Table 1.2 Ten Most Used Animals in 2017 8
Table 1.3 Number of Animals Reported in Breeding Colonies 8
Table 1.4 Number of Animals Used by Animal Type and Project Purpose 9
Table 1.5 Number of Animals Used by Project Purpose 12
Table 1.6 Animals Used to Understand Human / Animal Biology 13
Table 1.7 Animals Used to Achieve Environmental Purposes 14
Table 1.8 Animals Used for Improvement of Human / Animal Health / Welfare 15
Table 1.9 Animals Used to Achieve Educational Purposes 16
Table 1.10 Animals for Improvement of Animal Management / Production 17
Table 1.11 Number of Animals Used by Animal Type by Source 18
Table 1.12 Number of Animals Used by Animal Type by Procedure Type 21
Table 1.13 Number of Animals Used by Procedure and by Project Purpose 25
Table 1.14 Number of Animals Used by Procedure Type and Impact 27
Table 1.15 Number of Animals Used by Procedure Type and Procedure Benefit 29
Table 1.16 Number of Animals Used by Animal Type by Project Benefit 31
Table 1.17 Number of Animals Used, by Project Impact by Project Benefit 35
Table 1.18 Number of Animals Used and Deaths by Type 36
Table 1.19 Number of Specified Animals Used and Deaths by Type 38
Table 2.1 Number of Non-Genetically Modified Specified Animals in Breeding Colonies by Animal Type, 2007–2017 42
Table 2.2 Number of Genetically Modified Specified Animals in Breeding Colonies by Animal Type, 2007–2017 43
Table 2.2 Number of Active Licences and Number of Projects, 2007–2017 43

List of Figures

Figure 1.1 Animals Used by Project Purpose 12
Figure 1.2 Animals Used to Understand Human / Animal Biology 13
Figure 1.3 Animals Used to Achieve Environmental Purposes 14
Figure 1.4 Animals Used for Improvement of Human / Animal Health / Welfare 15
Figure 1.5 Animals Used to Achieve Educational Purposes..... 16
Figure 1.6 Animals Used for Improvement of Animal Management / Production..... 17
Figure 1.7 Percentage of Animals Used by Impact..... 28
Figure 2.1 Number of Animals Used, 2007–2017 39
Figure 2.2 Percentage of Animals Used by Project Purpose, 2012–2017 39
Figure 2.3 Percentage of Animals Used by Procedure Type, 2012–2017..... 40
Figure 2.4 Number of Specified Mice Used, 2007–2017..... 40
Figure 2.5 Number of Specified Animals, Excluding Mice and Non-human Primates, 2007–2017 41
Figure 2.6 Number of Non-human Primates, 2007-2017..... 41
Figure 2.7 Number of Animals Used in Genetic Modification Procedures and Number of Projects, 2007–17 42
Figure 2.8 Number of Specified Mice in Breeding Colonies, 2007–2017..... 43

Introduction

Animal Welfare Victoria under the Department of Jobs, Precincts and Regions (DPJR), regulates and monitors the use of animals for research, teaching, and testing in Victoria. It safeguards the well-being of animals by granting licences only to individuals or institutions that meet DPJR's licensing requirements; conducting audits to ensure that requirements under the *Australian code for the care and use of animals for scientific purposes, 8th ed. 2013* are being met; providing advice on best practice in animal use in research, teaching and testing for scientific procedures; and providing training programs to stakeholders.

Each year, all individuals and organisations licensed under the *Prevention of Cruelty to Animals Act 1986* are required to submit data on their use of animals for scientific procedures and breeding in compliance with Regulation 100 of the Prevention of Cruelty to Animals Regulations 2008. This reporting requirement is one of the several techniques in place that enables Animal Welfare Victoria to monitor animal welfare.

This report presents information on animal use of all licence holders in 2017. Part 1 presents animal use statistics in 2017, including the purpose, source, and deaths. Part 2 presents yearly statistics of animal use from 2007 to 2017.

This report informs the DPJR's policy development and compliance programs and is a useful tool in informing the community about the nature and purpose of animal use in Victoria.

Further information on the data collected for this report may be found in the 2017 return guidelines, available at www.agriculture.vic.gov.au/ART.

PART 1 NUMBER OF ANIMALS REPORTED AS USED IN 2017

1.1 Number of Animals Reported as Used, by Animal Type

In 2017, a total of **1,571,374** animals were reported to be used for teaching, research, and testing (scientific procedures). The table below shows the number of animals used by type. This shows a 45% increase from 2016's animal use figure of **1,080,136**. This increase is attributed to the 125% increase in the number of fishes used (from 294,950 in 2016 to 666,089 in 2017) and the 954% increase in the number of amphibians used (from 3,713 in 2016 to 39,146 in 2017).

'Specified animals' are guinea pigs, rats, mice, and rabbits not bred in their native habitat; and non-human primates. Only licensed breeders can supply these species to research organisations for use in projects.

Table 1.1 Number of Animals Reported as Used by Animal Type

Animal Type	Number of animals
*Guinea pig (lab)	4,020
*Macaques	104
*Marmosets	122
*Mouse (lab)	521,636
*Primates other	1
*Rabbit (lab)	1,680
*Rat (lab)	20,859
Amphibians	39,146
Bird exotic captive	10
Bird exotic wild	747
Bird native captive	376
Bird native wild	57,536
Bird other	37
Cats (non-wild)	538
Cats (wild)	43
Cattle	27,362
Cephalopods	124
Crustaceans	16,065
Dasyurids	1,163
Dogs (non-wild)	4,469
Dogs, foxes (wild)	853
Exotic feral mammal other	625
Exotic Zoo mammal	34
Ferret (lab)	1,018
Fish	666,089
Goats (domestic)	1,629
Hares (wild)	31
Horses (domestic)	551
Koalas	824
Laboratory mammal other	2,636
Lizards	3,177
Macropods	2,817
Mice (wild)	1,358
Monotremes	69
Native mammal other	1,518
Native Rats, Mice	1,627
Other domestic mammals	2,149
Pigs (domestic)	4,699
Possums, Gliders	1,784
Poultry	90,488
Rabbits (wild)	1,015
Rats (wild)	341
Reptile other	4
Seals, Sealions	2,971
Sheep (domestic)	86,719
Snakes	63
Tortoises/ turtle	81
Whales, Dolphins	166
Total	**1,571,374**

**Specified animals.*

The 10 most used animals in 2017 are listed in Table 1.2 below.

Table 1.2 Ten Most Used Animals in 2017

Row Labels	Number of animals
Fish	666,089
*Mouse (lab)	521,636
Poultry	90,488
Sheep (domestic)	86,719
Bird native wild	57,536
Amphibians	39,146
Cattle (domestic)	27,360
*Rat (lab)	20,859
Crustaceans	16,065
Pigs (domestic)	4,699

**Specified animals.*

The total reported number of specified animals in breeding colonies was **1,524,439.** The table below shows the number of specified animals in breeding colonies, excluding the offspring supplied to research or teaching projects (these are recorded in Table 1.1).

Table 1.3 Number of Animals Reported in Breeding Colonies

Animal Type	Number of animals
*Guinea pig (lab)	48
*Macaques	476
*Marmosets	744
*Mouse (lab)	1,479,459
*Rabbit (lab)	86
*Rat (lab)	43,626
Total	**1,524,439**

**Specified animals.*

1.2 Number of Animals Used, by Animal Type and Project Purpose

Of the total **1,571,374** animals used for scientific purposes, **679,260** were used for understanding human / animal biology; **477,224** were used for pursuing environmental objectives; **225,688** for maintenance / improvement of human / animal health / welfare; **110,932** for achieving educational objectives; and **78,270** for improving animal management / production. The animals used for each purpose is presented in the table below.

Table 1.4 Number of Animals 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)	141			3,635	244	4,020
*Macaques				44	60	104
*Marmosets				1	121	122
*Mouse (lab)	10,376	30	5,615	125,123	380,492	521,636
*Primates other				1		1
*Rabbit (lab)	57		14	1,203	406	1,680
*Rat (lab)	1,345	32	170	7,930	11,382	20,859
Amphibians	1,408	12,975	818	66	23,879	39,146
Bird exotic captive					10	10
Bird exotic wild		747				747
Bird native captive	85	157		76	58	376
Bird native wild	10,068	38,304		228	8,936	57,536
Bird other	2			35		37

Animal Type	Educational objectives	Environmental objectives	Improve animal management/production	Maintenance/improvement human/animal health/welfare	Understand human/animal biology	Total
Cats (non-wild)	356	3	9	155	15	538
Cats (wild)	12	15	16			43
Cattle	3,542	110	17,856	5,692	162	27,362
Cephalopods	3	30	85		6	124
Crustaceans	185	2,400	13,463		17	16,065
Dasyurids	51	1,070	20		22	1,163
Dogs (non-wild)	1,587	2,062	141	456	223	4,469
Dogs, foxes (wild)	15	836		2		853
Exotic feral mammal other		625				625
Exotic Zoo mammal			3	31		34
Ferret (lab)	8			1,010		1,018
Fish	4,233	404,708	9,606	3,888	243,654	666,089
Goats (domestic)	37		999	593		1,629
Hares (wild)	1	30				31
Horses (domestic)	217		23	230	81	551
Koalas	83	591	30	3	117	824
Laboratory mammal other				460	2,176	2,636
Lizards	124	1,112			1,941	3,177
Macropods	115	2,346		16	340	2,817
Mice (wild)	151	934		273		1,358
Monotremes	5	63			1	69
Native mammal other	215	1,043	17	208	35	1,518

Animal Type	Educational objectives	Environmental objectives	Improve animal management/production	Maintenance/improvement human/animal health/welfare	Understand human/animal biology	Total
Native Rats, Mice	342	1,259		12	14	1,627
Other domestic mammals	128	1	2,000	20		2,149
Pigs (domestic)	189		3,648	675	187	4,699
Possums, Gliders	165	1,447		172		1,784
Poultry	25,262	252	5,716	55,733	3,525	90,488
Rabbits (wild)	22	673	320			1,015
Rats (wild)	214	127				341
Reptile other	4					4
Seals, Sealions		2,971				2,971
Sheep (domestic)	50,154	15	17,685	17,713	1,152	86,719
Snakes		59		2	2	63
Tortoises/ turtle	30	33	16	2		81
Whales, Dolphins		164			2	166
Total	**110,932**	**477,224**	**78,270**	**225,688**	**679,260**	**1,571,374**

**Specified animals.*

Table 1.5 Number of Animals Used by Project Purpose

Project Purpose	Number of animals
Understand human/animal biology	679,260
Environmental objectives	477,224
Maintenance/improvement human/animal health/welfare	225,688
Educational objectives	110,932
Improve animal management/production	78,270
Total	**1,571,374**

Figure 1.1 Animals Used by Project Purpose

The 10 most used animals for each objective was chosen for analysis purposes. The most used animal for activities relating to the improvement of human and animal health and welfare and for understanding human and animal biology was the laboratory mouse. Fish and native wild bird were used most for activities relating to environmental purposes, while the domestic sheep was used most for educational purposes and for the improvement of animal management and production.

1.2.1 Animals Used to Understand Human / Animal Biology

The 10 most used animals for activities relating to the understanding of human and animal biology are presented below.

Table 1.6 Animals Used to Understand Human / Animal Biology

Animal Used	Number of animals
*Mouse (lab)	380,492
Fish	243,654
Amphibians	23,879
*Rat (lab)	11,382
Bird native wild	8,936
Poultry	3,525
Laboratory mammal other	2,176
Lizards	1,941
Sheep (domestic)	1,152
*Rabbit (lab)	406

Specified animals.

Figure 1.2 Animals Used to Understand Human / Animal Biology

Specified animals.

1.2.2 Animals Used to Achieve Environmental Purposes

The 10 most used animals for environmental purposes are presented below.

Table 1.7 Animals Used to Achieve Environmental Purposes

Animal Type	Number of animals
Fish	404,708
Bird native wild	38,304
Amphibians	12,975
Seals, Sealions	2,971
Crustaceans	2,400
Macropods	2,346
Dogs (non-wild)	2,062
Possums, Gliders	1,447
Native Rats, Mice	1,259
Lizards	1,112

Figure 1.3 Animals Used to Achieve Environmental Purposes

1.2.3 Animals Used for Improvement of Human / Animal Health / Welfare

The 10 most used animals for activities relating to the improvement human and animal health and welfare are presented below.

Table 1.8 Animals Used for Improvement of Human / Animal Health / Welfare

Animal Type	Number of animals
*Mouse (lab)	125,123
Poultry	55,733
Sheep (domestic)	17,713
*Rat (lab)	7,930
Cattle (domestic)	5,694
Fish	3,888
*Guinea pig (lab)	3,635
*Rabbit (lab)	1,203
Ferret (lab)	1,010
Pigs (domestic)	675

*Specified animals.

Figure 1.4 Animals Used for Improvement of Human / Animal Health / Welfare

*Specified animals.

1.2.4 Animals Used to Achieve Educational Purposes

The 10 most used animals to achieve educational purposes are presented below.

Table 1.9 Animals Used to Achieve Educational Purposes

Animal Type	Number of animals
Sheep (domestic)	50,154
Poultry	25,262
*Mouse (lab)	10,376
Bird native wild	10,068
Fish	4,233
Cattle (domestic)	3,542
Dogs (non-wild)	1,587
Amphibians	1,408
*Rat (lab)	1,345
Cats (non-wild)	356

*Specified animals.

Figure 1.5 Animals Used to Achieve Educational Purposes

*Specified animals.

1.2.5 Animals Used for Improvement of Animal Management / Production

The top 10 animals used for activities for the improvement of animal management and production are presented below.

Table 1.10 Animals for Improvement of Animal Management / Production

Row Labels	Number of animals
Cattle (domestic)	17,856
Sheep (domestic)	17,685
Crustaceans	13,463
Fish	9,606
Poultry	5,716
*Mouse (lab)	5,615
Pigs (domestic)	3,648
Other domestic mammals	2,000
Goats (domestic)	999
Amphibians	818

*Specified animals.

Figure 1.6 Animals Used for Improvement of Animal Management / Production

*Specified animals.

1.3 Number of Animals Used by Animal Type by Source

The animals used for scientific research, teaching and testing come from various sources. In 2017, around 43.1% of the animals used for scientific purposes came from the animals' natural habitat; followed by specified animals bred by the licence holder for their own supply at around 34.7%; and privately-owned animals on farms at 8.1%.

Table 1.11 Number of Animals Used by Animal Type by Source

Animal Type	*Interstate Licenced Supplier	*Overseas Supplier	*Vic SABL Supplier	Animals in their natural habitat	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
*Guinea pig (lab)	26		124						3,870				4,020
*Macaques			40						64				104
*Marmosets			109						13				122
*Mouse (lab)	35,259	5,408	58,990					2,227	419,752				521,636
*Primates other								1					1
*Rabbit (lab)	394	99	394						793				1,680
*Rat (lab)	6,817		6,210					269	7,563				20,859
Amphibians				35,842	11	513			829			1,951	39,146
Bird exotic captive										10			10
Bird exotic wild				747									747
Bird native captive				18	191	77				80		10	376
Bird native wild				57,422	4							110	57,536
Bird other								2	0		35		37
Cats (non-wild)				3		4	35	344	135		17		538

Animal Type	*Interstate Licenced Supplier	*Overseas Supplier	*Vic SABL Supplier	Animals in their natural habitat	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
Cats (wild)				43									43
Cattle										2			2
Cattle (domestic)						606		92	11,970	5	14,687		27,360
Cephalopods				30								94	124
Crustaceans				2,316		4,341						9,408	16,065
Dasyurids				1,129	28				6				1,163
Dogs (non-wild)				2,046			2	1,097	813	146	365		4,469
Dogs, foxes (wild)				853									853
Exotic feral mammal other				625									625
Exotic Zoo mammal					34								34
Ferret (lab)						1,018			0				1,018
Fish				561,308	4	7,789		2,192	83,208		45	11,543	666,089
Goats (domestic)						32		5			1,592		1,629
Hares (wild)				31									31
Horses (domestic)						91		150	152	24	134		551
Koalas				815	3							6	824
Laboratory mammal other									2,636				2,636
Lizards				1,375		0			135			1,667	3,177

Animal Type	*Interstate Licenced Supplier	*Overseas Supplier	*Vic SABL Supplier	Animals in their natural habitat	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
Macropods				2,326	413				78				2,817
Mice (wild)				1,358									1,358
Monotremes				69									69
Native mammal other				1,488	24							6	1,518
Native Rats, Mice				1,546	12			57				12	1,627
Other domestic mammals								132	17		2,000		2,149
Pigs (domestic)						1,157		200	172		3,170		4,699
Possums, Gliders				1,586	2			172				24	1,784
Poultry						56,314		33	7,100		27,041		90,488
Rabbits (wild)				628				368			19		1,015
Rats (wild)				341									341
Reptile other				4					0				4
Seals, Sealions				2,971									2,971
Sheep (domestic)						2,590		541	5,509		78,079		86,719
Snakes				61		0						2	63
Tortoises/ turtle				48	2			30				1	81
Whales, Dolphins				166									166
Grand Total	**42,496**	**5,507**	**65,867**	**677,195**	**728**	**74,532**	**37**	**7912**	**544,815**	**267**	**127,184**	**24,834**	**1,571,374**

**Specified animals.*

1.4 Number of Animals Used, by Animal Type by Procedure Type

The procedures conducted on animals depend on several factors such as the purpose of the project, the field of study or research, or new technologies developed. Before these procedures are conducted on animals, these procedures must be reviewed and approved by the nominated Animal Ethics Committee under strict parameters prescribed under the *Australian code for the care and use of animals for scientific purposes, 8th ed. 2013.*

Table 1.12 Number of Animals Used by Animal Type by Procedure Type

Animal Type	Attachment/insertion of devices for long-term monitoring	Aversive stimuli for behavioural training or stress integral to experiment	Gene manipulative technology	Immunomodulatory methods	In vivo production of monoclonal antibody	In vivo production of polyclonal antibody	Induction of infection	Induction of neoplasia	Induction of other disease model e.g. diabetes, cardiac disease	Interference with the central nervous system or sensory capacity or controlling brain centres	Ionising radiation exposure	Neuromuscular blocking agents or electro-immobilisation	Other procedure	Skin irritancy test of chemical, cosmetic or other preparation	Toxicity testing	Total
*Guinea pig (lab)	171			36			1,033		14	128			2,484		154	4,020
*Macaques	6						30		35			2	31			104
*Marmosets	5									92		13	12			122
*Mouse (lab)	795	2,310	34,241	28,750	709	1,098	80,315	71,955	57,938	4,484	17248		220,706	65	1,022	521,636
*Primates other													1			1
*Rabbit (lab)			39	684	24	378			28				527			1,680
*Rat (lab)	1,047	1,720	278		247	6			4,024	1,223			11,876	20	418	20,859

Animal Type	Attachment/insertion of devices for long-term monitoring	Aversive stimuli for behavioural training or stress integral to experiment	Gene manipulative technology	Immunomodulatory methods	In vivo production of monoclonal antibody	In vivo production of polyclonal antibody	Induction of infection	Induction of neoplasia	Induction of other disease model e.g. diabetes, cardiac disease	Interference with the central nervous system or sensory capacity or controlling brain centres	Ionising radiation exposure	Neuromuscular blocking agents or electro-immobilisation	Other procedure	Skin irritancy test of chemical, cosmetic or other preparation	Toxicity testing	Total
Amphibians													39,146			39,146
Bird exotic captive	10															10
Bird exotic wild													747			747
Bird native captive	119	79		32									146			376
Bird native wild	3,189												54,347			57,536
Bird other													37			37
Cats (non-wild)	60									9		4	465			538
Cats (wild)													43			43
Cattle (domestic)	115	770		694		20	142						25,621			27,362
Cephalopods		6											118			124
Crustaceans	7,091												8,974			16,065
Dasyurids	11						8						1,144			1,163
Dogs (non-wild)		8		2									4,457		2	4,469
Dogs, foxes (wild)	2												851			853
Exotic feral mammal other													625			625
Exotic Zoo mammal													34			34
Ferret (lab)							1,010						8			1,018
Fish	9,529	26	63,810				922	242	298				585,843		5,419	666,089

Animal Type	Attachment/insertion of devices for long-term monitoring	Aversive stimuli for behavioural training or stress integral to experiment	Gene manipulative technology	Immunomodulatory methods	In vivo production of monoclonal antibody	In vivo production of polyclonal antibody	Induction of infection	Induction of neoplasia	Induction of other disease model e.g. diabetes, cardiac disease	Interference with the central nervous system or sensory capacity or controlling brain centres	Ionising radiation exposure	Neuromuscular blocking agents or electro-immobilisation	Other procedure	Skin irritancy test of chemical, cosmetic or other preparation	Toxicity testing	Total
Goats (domestic)													1,629			1,629
Hares (wild)													31			31
Horses (domestic)				18		85					29		413		6	551
Koalas	46												778			824
Laboratory mammal other				44					166				2,426			2,636
Lizards													3,177			3,177
Macropods	28												2,789			2,817
Mice (wild)	135												1,223			1,358
Monotremes	31												38			69
Native mammal other	697	15											806			1,518
Native Rats, Mice	145												1,482			1,627
Other domestic mammals													2,149			2,149
Pigs (domestic)	15	64	120	94		6	801				28		3,565		6	4,699
Possums, Gliders	201												1,583			1,784
Poultry			3,448	837		3	54,821						31,379			90,488
Rabbits (wild)													1,015			1,015
Rats (wild)													341			341
Reptile other													4			4

Animal Type	Attachment/insertion of devices for long-term monitoring	Aversive stimuli for behavioural training or stress integral to experiment	Gene manipulative technology	Immunomodulatory methods	In vivo production of monoclonal antibody	In vivo production of polyclonal antibody	Induction of infection	Induction of neoplasia	Induction of other disease model e.g. diabetes, cardiac disease	Interference with the central nervous system or sensory capacity or controlling brain centres	Ionising radiation exposure	Neuromuscular blocking agents or electro-immobilisation	Other procedure	Skin irritancy test of chemical, cosmetic or other preparation	Toxicity testing	Total
Seals, Sealions	16												2955			2971
Sheep (domestic)	2,055		18		10		102		237	42	14		84121		120	86719
Snakes													63			63
Tortoises/ turtle	1												80			81
Whales, Dolphins													166			166
Total	**25,520**	**4,998**	**101,954**	**31191**	**990**	**1,596**	**139,184**	**72197**	**62,740**	**5,978**	**17,319**	**19**	**1,100,456**	**85**	**7,147**	**1,571,374**

**Specified animals.*

1.4.1 Number of Animals Used by Procedure and by Project Purpose

Table 1.13 Number of Animals Used by Procedure and by Project Purpose

Procedure	Educational objectives	Environmental objectives	Improve animal management/ production	Maintenance/ improvement human/ animal health/welfare	Understand human/ animal biology	Total
Other procedure	106,943	466,626	60,102	77,621	389,164	1,100,456
Induction of infection	4	922	4,913	77,106	56,239	139,184
Gene manipulative technology			1,330	15,236	85,388	101,954
Induction of neoplasia				24,016	48,181	72,197
Induction of other disease model e.g. diabetes, cardiac disease	80			16,395	46,265	62,740
Immunomodulatory methods			500	6,802	23,889	31,191
Attachment/insertion of devices for long-term monitoring	3,783	9,457	8,840	700	2,740	25,520
Ionising radiation exposure	42			2,066	15,211	17,319
Toxicity testing		131	1,800	1,334	3,882	7,147
Interference with the central nervous system or sensory capacity or controlling brain centres	54			1,570	4,354	5,978
Aversive stimuli for behavioural training or stress integral to experiment	26	43	785	2,074	2,070	4,998
In vivo production of polyclonal antibody				662	934	1,596

Procedure	Educational objectives	Environmental objectives	Improve animal management/ production	Maintenance/ improvement human/ animal health/welfare	Understand human/ animal biology	Total
In vivo production of monoclonal antibody				66	924	990
Skin irritancy test of chemical, cosmetic or other preparation		45		40		85
Neuromuscular blocking agents or electro-immobilisation					19	19
Total	**110,932**	**477,224**	**78,270**	**225,688**	**679,260**	**1,571,374**

1.4.2 Number of Animals Used by Procedure Type and Procedure Impact

Table 1.14 Number of Animals Used by Procedure Type and Impact

Procedure Impact	Attachment/insertion of devices for long-term monitoring	Aversive stimuli for behavioural training or stress integral to experiment	Gene manipulative technology	Immunomodulatory methods	In vivo production of monoclonal antibody	In vivo production of polyclonal antibody	Induction of infection	Induction of neoplasia	Induction of other disease model e.g. diabetes, cardiac disease	Interference with the central nervous system or sensory capacity or controlling brain centres	Ionising radiation exposure	Neuromuscular blocking agents or electro-immobilisation	Other procedure	Skin irritancy test of chemical, cosmetic or other preparation	Toxicity testing	Total
Minor conscious intervention	16,534	1,459	11,029	8,040	149	179	1,764	5,430	8,015	1,178	209		595,506		90	649,582
Observational study involving minor interference	5,308	2,524	77,295	535			1,186	14,624	2,209	279	29		301,325		618	405,932
Animal unconscious without recovery	159	6	7,736	5,536	32	2	24,188	555	6,194	283	154	12	117,410		3,510	1657,77
Minor physiological challenge	99	243	653	7,842	119	724	72,358	7,914	8,839		2,173		42,926	85	2,495	146,470
Moderate to major physiological challenge		339	1,236	5,228	690	389	36,120	30,018	13,825	1,540	14,010		11,827		403	115,625
Minor operative procedures with recovery	1,090	65	2,055	3,871		296	1,139	6,168	6,149	350	648		21,657		10	43,498
Surgery with recovery	2,330	362	1,950	139		6	59	7,488	17,410	2,348	96	7	6,403		21	38,619
Death as an endpoint							2,370		99				3,402			5,871
Total	**25,520**	**4,998**	**101,954**	**31,191**	**990**	**1,596**	**139,184**	**72,197**	**62,740**	**5,978**	**17,319**	**19**	**1,100,456**	**85**	**7,147**	**1,571,374**

In 2017, 41% of the animals used for scientific research, testing and teaching underwent minor conscious intervention and 26% were used for observational study involving minor interference. Nine percent of the total animals used underwent minor physiological challenge while 3% underwent minor operative procedures and 3% underwent surgery with recovery. Eleven percent of the animals underwent terminal procedures under anaesthesia.

Figure 1.7 Percentage of Animals Used by Impact

1.4.3 Number of Animals Used by Procedure Type and Procedure Benefit

Table 1.15 Number of Animals Used by Procedure Type and Procedure Benefit

Procedure	Development of techniques	Diseases- animal	Diseases- human	Diseases- zoonotic	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	Xenotransplantation	Total
Other procedure	1,787	14,082	120,171	3,476	54,413	51,536	458,811	123,416	4,141	979	41,288	1,227	225,129		1,100,456
Induction of infection	426	9,527	68,260	1,999		4		32,273	19,092	6,681		922			139,184
Gene manipulative technology	413	1,009	21,036	185				78,910	401						101,954
Induction of neoplasia	509	100	60,303					10,650						635	72,197
Induction of other disease model e.g. diabetes, cardiac disease	260	308	56,717					5,373	82						62,740
Immunomodulatory methods		1,472	10,093	50	500			18,509		567					31,191
Attachment/insertion of devices for long-term monitoring	3,533	6	1,506		1,846		6,064	1,489	43	25	41		10,967		25,520
Ionising radiation exposure		18	3,957		29	42		13,273							17,319
Toxicity testing		600	896				119	5,482	10	40					7,147
Interference with the central nervous system or sensory capacity or controlling brain centres	31		3,378			54		2,515							5,978

Procedure	Development of techniques	Diseases- animal	Diseases- human	Diseases- zoonotic	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	Xenotransplantation	Total
Aversive stimuli for behavioural training or stress integral to experiment			2,230		834		8	1,832					94		4998
In vivo production of polyclonal antibody		226	587	12				456	315						1596
In vivo production of monoclonal antibody			66					268	656						990
Skin irritancy test of chemical, cosmetic or other preparation			40							45					85
Neuromuscular blocking agents or electro-immobilisation								19							19
Total	**6,959**	**27,348**	**349,240**	**5,722**	**57,622**	**51,636**	**465,002**	**294,465**	**24,740**	**8,337**	**41,329**	**2,149**	**236,190**	**635**	**1,571,374**

1.5 Number of Animals Used, by Animal Type by Project Benefit

Table 1.16 Number of Animals Used by Animal Type by Project Benefit

Animal Type	Development of techniques	Diseases- animal	Diseases- human	Diseases- zoonotic	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	Xenotransplantation	Total
Fish	3,448		681		2,658	313	400,520	83,612			446	922	173,489		666,089
*Mouse (lab)	1,657	7,542	303,577	2,147	4,339	796	433	192,838	729	58	6,885			635	521,636
Poultry	432	3,927	27,195	860	1,639	234		2,817	21,964	6,395	25,022		3		90,488
Sheep (domestic)	234	4,907	1,354	428	27,380	45,515	15	705	1,462	31	4,688				86,719
Bird native wild	700			1,033		164	26,791	1,862			282		26,704		57,536
Amphibians	9		16			350	32,650	242			295	20	5,564		39,146
Cattle (domestic)		4,045		837	18,069	2,609	110	20		839	831				27,360
*Rat (lab)	34	19	12,470			332	6	6,856	237	32	873				20,859
Crustaceans						185	1,062	17					14,801		16,065
Pigs (domestic)	26	1,098	187	50	2,369	51		15		807	96				4,699
Dogs (non-wild)	244	494	9	100	78	366	14	32	2	67	994		2,069		4,469

Animal Type	Development of techniques	Diseases- animal	Diseases- human	Diseases- zoonotic	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	Xenotransplantation	Total
*Guinea pig (lab)	80	1,247	2,389			44		140		29	91				4,020
Lizards						26	578	1,941			27		605		3,177
Seals, Sealions													2,971		2,971
Macropods	2	14					364	80			38		2,319		2,817
Laboratory mammal other			124					2,512							2,636
Other domestic mammals	32	2,000				39	1				77				2,149
Possums, Gliders				172		61	235				44		1,272		1,784
*Rabbit (lab)		686	161	12				402	312	64	43				1,680
Goats (domestic)		593			999	37									1,629
Native Rats, Mice			12			10	329				44		1,232		1,627
Native mammal other		201		6			404	1					906		1,518
Mice (wild)		273					54				22	450	559		1,358
Dasyurids				8			130	8			123		894		1,163

Animal Type	Development of techniques	Diseases- animal	Diseases- human	Diseases- zoonotic	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	Xenotransplantation	Total
Ferret (lab)	8	12	920	69					9						1,018
Rabbits (wild)						19	1					688	307		1,015
Dogs, foxes (wild)						8	5						840		853
Koalas							418	98			2		306		824
Bird exotic wild							647						100		747
Exotic feral mammal other							111					14	500		625
Horses (domestic)	4	117	85		52	30		55	6	15	187				551
Cats (non-wild)	32	92	15		39	201		13			134	9	3		538
Bird native captive	5	32						17			80		242		376
Rats (wild)						213	10						118		341
Whales, Dolphins							2						164		166
Cephalopods						3	1	6					114		124
*Marmosets			1					110	11						122
*Macaques			44					54	6						104

Animal Type	Development of techniques	Diseases- animal	Diseases- human	Diseases- zoonotic	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	Xenotransplantation	Total
Tortoises/ turtle						30	50						1		81
Monotremes							3				1		65		69
Snakes							53	2	2				6		63
Cats (wild)							1					16	26		43
Bird other		35									2				37
Exotic Zoo mammal	12	14											8		34
Hares (wild)												30	1		31
Bird exotic captive								10							10
Reptile other							4								4
Cattle											2				2
*Primates other													1		1
Total	**6,959**	**27,348**	**349,240**	**5,722**	**57,622**	**51,636**	**465,002**	**294,465**	**24,740**	**8,337**	**41,329**	**2,149**	**23,6190**	**635**	**1,571,374**

**Specified animals.*

1.5.1 Number of Animals Used, by Project Impact by Project Benefit

Table 1.17 Number of Animals Used, by Project Impact by Project Benefit

Animal Type	Development of techniques	Diseases- animal	Diseases- human	Diseases- zoonotic	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	Xenotransplantation	Total
Minor conscious intervention, no anaesthesia	794	7,439	69,153	3,345	28,143	283	276,141	65,377	2,615	1,037	5,965	218	189,072		649,582
Observational study involving minor interference	4,399	6,161	38,764	195	25,319	50,245	161,317	85,436	655	483	2,619	281	30,058		405,932
Animal unconscious without recovery	481	1,418	48,246	74	2,565	1,007	593	55,775	19,761	2,768	30,041	728	2,320		165,777
Minor physiological challenge	504	3,407	57,995	19	766	72	26,280	45,151	353	4,004	184		7,735		146,470
Moderate to major physiological challenge	5	6,356	77,216	1,917	64			28,078	1,049	18		922			115,625
Minor operative procedures with recovery	347	90	20,625	172	765	6	516	11,290	264	2	2,467		6,952	2	43,498
Surgery with recovery	429	107	33,740			23	155	3,358	43	25	53		53	633	38,619
Death as an endpoint		2,370	3,501												5,871
Total	**6,959**	**27,348**	**349,240**	**5,722**	**57,622**	**51,636**	**465,002**	**294,465**	**24,740**	**8,337**	**41,329**	**2,149**	**236,190**	**635**	**1,571,374**

1.6 Number of Animals Used and Animal Deaths

Investigators must make arrangements for animals at the conclusion of a project. If appropriate, animals may be 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 should be considered wherever possible. Under certain conditions, with special justification, an AEC may approve an animal to be used in a subsequent project. In 2017, death was the reported fate for 89% of specified animals, reflecting their predominance in projects seeking to improve human or animal health or welfare. Of the non-specified animals, death was the reported fate for 19%.

Table 1.18 Number of Animals Used and Deaths by Type

Animal Type	Number of animals in project	Number of deaths in project	% of Deaths
Fish	666,089	85,554	13%
Poultry	90,488	87,387	97%
Sheep (domestic)	86,719	6,377	7%
Bird native wild	57,536	24	<1%
Amphibians	39,146	2,165	6%
Cattle	27,362	287	1%
Crustaceans	16,065	9,517	59%
Pigs (domestic)	4,699	902	19%
Dogs (non-wild)	4,469	10	<1%
Lizards	3,177	712	22%
Seals, Sealions	2,971	3	<1%
Macropods	2,817	108	4%
Laboratory mammal other	2,636	892	34%

Animal Type	Number of animals in project	Number of deaths in project	% of Deaths
Other domestic mammals	2,149	2	<1%
Possums, Gliders	1,784	7	<1%
Goats (domestic)	1,629	240	15%
Native Rats, Mice	1,627	19	1%
Native mammal other	1,518	15	1%
Mice (wild)	1,358	284	21%
Dasyurids	1,163	11	1%
Ferret (lab)	1,018	1,018	100%
Rabbits (wild)	1,015	688	68%
Dogs, foxes (wild)	853	6	1%
Koalas	824	2	<1%
Bird exotic wild	747	0	0%
Exotic feral mammal other	625	0	0%
Horses (domestic)	551	7	1%
Cats (non-wild)	538	28	5%
Bird native captive	376	95	25%
Rats (wild)	341	0	0%
Whales, Dolphins	166	0	0%
Cephalopods	124	120	97%
Tortoises/ turtle	81	0	0%
Monotremes	69	0	0%
Snakes	63	2	3%

Animal Type	Number of animals in project	Number of deaths in project	% of Deaths
Cats (wild)	43	0	0%
Bird other	37	0	0%
Exotic Zoo mammal	34	0	0%
Hares (wild)	31	30	97%
Bird exotic captive	10	10	100%
Reptile other	4	0	0%
Total	**1,022,952**	**196,522**	

Table 1.19 Number of Specified Animals Used and Deaths by Type

Animal Type	Number of animals in project	Number of deaths in project	% of Deaths
*Mouse (lab)	521,636	465,811	89%
*Rat (lab)	20,859	18,973	91%
*Guinea pig (lab)	4,020	3,884	97%
*Rabbit (lab)	1,680	1,557	93%
*Marmosets	122	72	59%
*Macaques	104	21	20%
*Primates other	1	0	0%
Total	**548,422**	**490,318**	

**Specified animals.*

PART 2 ANIMAL USE STATISTICS FROM 2007 TO 2017

2.1 Number of Animals Used, 2007–2017

The number of animals used in research, teaching and testing in 2017 was **1,571,374**. There was a 45% increase in the number of animals used in 2017, which was mainly due to the increase in the number of fishes and amphibians.

Figure 2.1 Number of Animals Used, 2007–2017

2.1.1 Animals Used in Scientific Procedures

Figure 2.2 Percentage of Animals Used by Project Purpose, 2012–2017

Figure 2.3 Percentage of Animals Used by Procedure Type, 2012–2017

2.2 Number of Specified Animals Used, 2007–2017

2.2.1. Number of Specified Mice Used, 2007–2017

A total of 521,636 specified (i.e., laboratory) mice were used in 2017. This shows a 31% increase from the 398,277 specified mice used in 2016. The long-term average of specified mice used from 2007–2017 is 466,379.

Figure 2.4 Number of Specified Mice Used, 2007–2017

2.2.2 Number of Specified Animals Excluding Mice and Non-human Primates, 2007 – 2017

A total of 26,527 specified (i.e., laboratory) rats, guinea pigs and rabbits were used in 2017. This comprised of 20,827 rats, 4,020 guinea pigs, and 1 680 rabbits.

Figure 2.5 Number of Specified Animals, Excluding Mice and Non-human Primates, 2007–2017

2.2.3 Number of Specified Primates, 2007 – 2017

A total of 226 non-human primates were used in 2017, comprised of 122 marmosets and 104 macaques.

Figure 2.6 Number of Non-human Primates, 2007-2017

2.3 Number of Animals Used in Genetic Modification Procedures and Number of Projects

A total of 194 projects used **101,954** animals in genetic modification in 2017. This figure includes animals used in specified breeding.

Figure 2.7 Number of Animals Used in Genetic Modification Procedures and Number of Projects, 2007–17

2.4 Number of Specified Animals in Breeding Colonies, by Animal Type, 2007–2017

Table 2.1 Number of Non-Genetically Modified Specified Animals in Breeding Colonies by Animal Type, 2007–2017

Type of animal	Year										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Guinea pigs	3,638	1,142	1,087	1,153	388	320	244	345	294	96	48
Macaques	203	341	225	243	250	244	226	263	282	274	476
Marmosets	159	135	166	177	156	146	273	305	440	463	744
Mice	237,246	281,875	344,823	360,185	365,009	396,710	389,049	420,126	384,762	379,198	644,519
Rabbits	527	504	515	445	489	214	197	133	179	159	86
Rats	33,407	42,558	56,993	52,786	48,543	31,886	33,308	25,546	23,744	27,754	40,719
Total	**275,180**	**326,555**	**403,809**	**414,989**	**414,835**	**429,520**	**423,297**	**446,718**	**409,701**	**407,944**	**691,592**

Table 2.2 Number of Genetically Modified Specified Animals in Breeding Colonies by Animal Type, 2007–2017

Type of animal	Year										
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Mice	389,632	461,745	490,962	531,098	558,293	578,240	584,660	568,495	582,925	683,769	829,940
Rats	13,120	9,304	1,923	1,146	1,744	1,381	1,992	4,271	2,714	2,286	2,907
Total	**394,201**	**471,049**	**492,885**	**532,244**	**560,037**	**579,621**	**586,652**	**572,766**	**585,639**	**686,055**	**832,847**

Figure 2.8 Number of Specified Mice in Breeding Colonies, 2007–2017

2.5 Number of Licences and Projects

Table 2.2 Number of Active Licences and Number of Projects, 2007–2017

	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Number of projects	2,358	2,455	2,673	2,931	3,010	3,048	2,940	2,950	3,121	2,846	2,820
Number of licences	110	107	111	115	123	127	130	133	137	134	137