Statistics of animal use in research and teaching, Victoria

1 January 2016 to 31 December 2016

Report number 34

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# Introduction

The following figures and tables present information on the use of animals for research, teaching and testing (scientific procedures) in Victoria in 2016.

The Secretary of the Department of Economic Development, Jobs, Transport & Resources receives annual summary data from all institutions licensed under the *Prevention of Cruelty to Animals Act 1986* (The Act) to use animals for scientific procedures. For each year of the project, an ‘Animal Use Return’ form describing the animal use must be submitted in accordance with Regulation 100 of the Prevention of Cruelty to Animals Regulations 2008. Each project involving animal use must be approved by an Animal Ethics Committee. For the purposes of the legislation, a specified animal is a guinea pig, or a rat, mouse or rabbit that is not bred in its native habitat, or a non-human primate. Specified animal production must be licensed under Part 3 of the Act.

In Part 1 of this report, key elements of the 2016 data are presented in the context of previous years information. Detailed data for 2016 are provided in Part 2.

Further information on the data collected for this report may be found in the 2016 return guidelines, available on the Forms page at [www.agriculture.vic.gov.au/ART](http://www.agriculture.vic.gov.au/ART).

# 

# Part 1 key elements of animal use

## Number of animals used in scientific procedures, selected animal types

### Figure 1.1: Number of animals used, 2007–16

The number of animals used in research, teaching and testing in 2016 was 1 080 136. The high total for 2011 is explained by a single poultry project that used 1 000 000 birds.

**Year**

### Figure 1.2: Number of animals used by animal type, 2016

Number of animal types used in research and teaching in 2016. Animal types representing less than 1% of the total are amalgamated as ‘Other’. A single wildlife survey project reported the use of 123 819 ‘Native mammals (other)’.

### Figure 1.3: Number of specified mice used, 2007–16

A total of 398 277 specified mice were used in 2016, compared with the long term average of 467 806.

### Figure 1.4: Number of specified animals used, 2007–16, excluding mice and non-human primates

A total of 29 557 specified rats, guinea pigs and rabbits were used in 2016, compared with the long term average of 36 027. It comprised 24 131 rats (long term average of 29 470), 3962 guinea pigs (long term average of 4713) and 1464 rabbits (long term average of 1844).

### Figure 1.5: Number of specified primates used, 2007-16

A total of 181 non-human primates were used in 2016, compared with the long term average of 185. It comprised 95 marmosets (long term average of 113) and 86 macaques (long term average of 71). The above average number of marmosets in 2011 was due to two projects using 145 animals in studies of social behaviour.

## Animals used in scientific procedures, selected aspects of animal use

### Figure 1.6: Percentage of animals used by project mission for the past five years.

### Figure 1.7: Number of animals used in genetic modification procedures and numbers of projects, 2007–16

A total of 259 projects used 133 852 animals in genetic modification in 2016.

**Year**

### Figure 1.8: Percentage of animals by procedure category for the past five years.

### Figure 1.9: Percentage of animals used by source for the past five years (excluding sources representing less than 1 per cent of animal use).

## Breeding of specified animals for scientific procedures

### Table 1.1: Number of non-genetically modified specified animals in breeding colonies 2007–16, by animal type.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Type of animal | Year | | | | | | | | | |
| **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | 2016 |
| Guinea pigs | 3638 | 1142 | 1087 | 1153 | 388 | 320 | 244 | 345 | 294 | 96 |
| Macaques | 203 | 341 | 225 | 243 | 250 | 244 | 226 | 263 | 282 | 274 |
| Marmosets | 159 | 135 | 166 | 177 | 156 | 146 | 273 | 305 | 440 | 463 |
| Mice | 237 246 | 281 875 | 344 823 | 360 185 | 365 009 | 396 710 | 389 049 | 420 126 | 384 762 | 379 198 |
| Rabbits | 527 | 504 | 515 | 445 | 489 | 214 | 197 | 133 | 179 | 159 |
| Rats | 33 407 | 42 558 | 56 993 | 52 786 | 48 543 | 31 886 | 33 308 | 25 546 | 23 744 | 27 754 |
| Total | 275 180 | 326 555 | 403 809 | 414 989 | 414 835 | 429 520 | 423 297 | 446 718 | 409 701 | 407 944 |

### Table 1.2: Number of genetically modified specified animals in breeding colonies 2007–16, by animal type

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Type of animal | Year | | | | | | | | | |
| **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | 2016 |
| Mice | 389 632 | 461 745 | 490 962 | 531 098 | 558 293 | 578 240 | 584 660 | 568 495 | 582 925 | 683 769 |
| Rats | 13 120 | 9304 | 1923 | 1146 | 1744 | 1381 | 1992 | 4271 | 2714 | 2286 |
| Total | 394 201 | 471 049 | 492 885 | 532 244 | 560 037 | 579 621 | 586 652 | 572 766 | 585 639 | 686 055 |

### Figure 1.10: Number of specified mice in breeding colonies, 2007–16.

## Breakdown of scientific procedure licences, projects, and numbers of animals

### Table 1.3: Number of projects and number of active licences, 2007–16.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Year | | | | | | | | | |
|  | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| Number of projects | 2358 | 2455 | 2673 | 2931 | 3010 | 3048 | 2940 | 2950 | 3121 | 2846 |
| Number of licences | 110 | 107 | 111 | 115 | 123 | 127 | 130 | 133 | 137 | 134 |
| Number of projects per licence | 21 | 23 | 24 | 25 | 24 | 24 | 23 | 22 | 23 | 21 |

### Table 1.4: Number of animals used and number of active licences, 2007–2016

Figures in parentheses exclude the anomalous poultry project in 2011.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | | | | | | | | | | |
|  | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| Number of animals used | 1 207 360 | 1 216 393 | 2 255 076 | 1 595 375 | 2 614 472  (1 614 472) | 1 288 810 | 1 084 507 | 910 052 | 1 068 034 | 1 080 136 |
| Number of licences | 110 | 107 | 111 | 115 | 123 | 127 | 130 | 133 | 137 | 134 |
| Number of animals used per licence | 10 976 | 11 368 | 20 316 | 13 873 | 21 256 (13 126) | 10 148 | 8342 | 6842 | 7796 | 8061 |

### Table 1.5: Number of animals used and number of projects, 2007–16

Figures in parentheses exclude the anomalous poultry project in 2011.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Year | | | | | | | | | |
|  | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| Number of animals used | 1 207 360 | 1 216 393 | 2 255 076 | 1 595 375 | 2 614 472 (1 614 472) | 1 288 810 | 1 084 507 | 910 052 | 1 068 034 | 1 080 136 |
| Number of projects | 2358 | 2455 | 2673 | 2931 | 3010 (3009) | 3048 | 2940 | 2950 | 3121 | 2846 |
| Number of animals used per project | 512 | 495 | 844 | 544 | 869 (537) | 423 | 369 | 308 | 342 | 380 |

# part 2 details of animal use

### Table 2.1: Number of animals used, by animal type and project purpose, 2016

| Animal Type | Project purpose | | | | | Total |
| --- | --- | --- | --- | --- | --- | --- |
|  | Animal management/ production | Educational | Environmental | Human/animal biology | Human/animal health/welfare |  |
|  |  |  |  |  |  |  |
| Amphibians | 366 | 531 | 1840 | 948 | 28 | **3713** |
| Birds (exotic captive) |  |  |  | 10 |  | **10** |
| Birds (exotic wild) |  |  | 87 | 100 |  | **187** |
| Birds (native captive) |  | 118 | 13 | 416 | 27 | **574** |
| Birds (native wild) | 100 | 1414 | 27 944 | 1991 | 15 253 | **46 702** |
| Birds, other |  |  | 155 | 8 |  | **163** |
| Cats (non-wild) |  | 308 | 5 | 42 | 242 | **597** |
| Cats (wild) |  |  | 31 |  |  | **31** |
| Cattle (domestic) | 7143 | 8395 |  | 250 | 6032 | **21 820** |
| Cattle (wild) |  |  | 2 |  |  | **2** |
| Cephalopods | 78 | 2 | 9 | 10 |  | **99** |
| Crustaceans | 16 125 | 1004 | 2523 | 28 |  | **19 680** |
| Dasyurids | 22 | 38 | 2029 | 220 | 6 | **2315** |
| Dogs (non-wild) | 84 | 1541 | 17 | 594 | 709 | **2945** |
| Dogs, foxes (wild) |  | 1 | 109 |  |  | **110** |
| Domestic mammals, other |  | 146 | 1 |  |  | **147** |
| Exotic feral mammals, other |  | 143 | 3 |  | 8 | **154** |
| Exotic zoo mammals | 9 |  |  |  | 22 | **31** |
| Ferrets (lab) |  |  |  |  | 2079 | **2079** |
| Fish | 15 274 | 6306 | 174 326 | 95 354 | 3690 | **294 950** |
| Goats (domestic) | 780 | 11 |  | 10 | 1735 | **2536** |
| Guinea pigs (lab) |  | 66 |  | 317 | 3579 | **3962** |
| Hares (wild) |  |  | 28 |  |  | **28** |
| Horses (domestic) |  | 295 |  | 11 | 398 | **704** |
| Koalas | 90 |  | 673 |  | 4 | **767** |
| Laboratory mammals, other |  |  |  | 989 | 155 | **1144** |
| Lizards | 18 | 160 | 1255 | 1489 |  | **2922** |
| Macaques |  |  |  | 30 | 56 | **86** |
| Macropods |  | 122 | 777 | 237 | 127 | **1263** |
| Marmosets |  |  |  | 95 |  | **95** |
| Mice (lab) | 10 442 | 9348 | 15 | 273 485 | 104 987 | **398 277** |
| Mice (wild) |  | 4 | 476 |  |  | **480** |
| Monotremes |  | 0 | 80 | 14 | 2 | **96** |
| Native mammals, other |  | 116 | 1784 | 123 872 | 260 | **126 032** |
| Native rats, mice |  | 97 | 726 |  | 28 | **851** |
| Pigs (domestic) | 6110 | 179 |  | 219 | 341 | **6849** |
| Possums, gliders |  | 85 | 2144 | 3 | 140 | **2372** |
| Poultry | 3452 | 534 |  | 1190 | 16 743 | **21 919** |
| Rabbits (lab) |  | 42 |  | 399 | 1023 | **1464** |
| Rabbits (wild) | 320 | 25 | 775 |  | 12 | **1132** |
| Rats (lab) | 380 | 1587 |  | 15125 | 7039 | **24 131** |
| Rats (wild) |  | 28 | 376 | 6 | 1 | **411** |
| Reptiles, other |  |  | 52 |  |  | **52** |
| Seals, sealions |  |  | 104 |  |  | **104** |
| Sheep (domestic) | 48 327 | 19 102 | 15 | 931 | 17 302 | **85 677** |
| Snakes |  | 9 | 59 |  | 2 | **70** |
| Turtles, tortoises |  |  | 163 |  |  | **163** |
| Whales, dolphins |  |  | 106 |  |  | **106** |
| Wombats |  | 14 | 111 |  | 9 | **134** |
| Total | **109 120** | **51 771** | **218 813** | **518 393** | **182 039** | **1 080 136** |

### Table 2.2: Number of animals used, by animal type and animal source, 2016

| Animal Type | Animal source | | | | | | | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Specified animal supplier | Other specified animal source | Animals in their natural habitat | Animals removed from natural habitat | Colony/zoo | Commercial supplier | Own derivation | Private donation | Privately owned animals on a farm | Other |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Amphibians |  |  | 2281 |  | 493 |  | 512 | 6 |  | 421 | **3713** |
| Birds (exotic captive) |  |  |  |  |  |  |  | 10 |  |  | **10** |
| Birds (exotic wild) |  |  | 187 |  |  |  |  |  |  |  | **187** |
| Birds (native captive) |  |  | 7 | 48 | 34 | 113 | 351 |  |  | 21 | **574** |
| Birds (native wild) |  |  | 46 490 | 192 |  | 19 |  |  |  | 1 | **46 702** |
| Birds, other |  |  | 155 |  |  |  | 8 |  |  |  | **163** |
| Cats (non-wild) |  |  | 5 |  |  | 421 | 171 |  |  |  | **597** |
| Cats (wild) |  |  | 31 |  |  |  |  |  |  |  | **31** |
| Cattle (domestic) |  |  | 2 |  | 197 | 182 | 1915 |  | 19 524 |  | **21 820** |
| Cattle (wild) |  |  | 2 |  |  |  |  |  |  |  | **2** |
| Cephalopods |  |  | 19 |  |  |  |  |  |  | 80 | **99** |
| Crustaceans |  |  | 2523 |  | 7252 |  |  |  |  | 9905 | **19 680** |
| Dasyurids |  |  | 2074 | 107 |  |  | 97 |  |  | 37 | **2315** |
| Dogs (non-wild) |  |  | 8 |  | 9 | 2369 | 166 | 236 | 157 |  | **2945** |
| Dogs, foxes (wild) |  |  | 110 |  |  |  |  |  |  |  | **110** |
| Domestic mammals, other |  |  |  |  |  | 139 | 8 |  |  |  | **147** |
| Exotic feral mammals, other |  |  | 154 |  |  |  |  |  |  |  | **154** |
| Exotic zoo mammals |  |  |  | 31 |  |  |  |  |  |  | **31** |
| Ferrets (lab) |  |  |  |  | 2079 |  |  |  |  |  | **2079** |
| Fish |  |  | 177 597 | 12 | 11 236 |  | 87 146 |  |  | 18 959 | **294 950** |
| Goats (domestic) |  |  |  |  | 10 | 11 |  |  | 2515 |  | **2536** |
| Guinea pigs (lab) | 3940 | 22 |  |  |  |  |  |  |  |  | **3962** |
| Hares |  |  | 28 |  |  |  |  |  |  |  | **28** |
| Horses (domestic) |  |  |  |  | 96 | 84 | 204 | 33 | 287 |  | **704** |
| Koalas |  |  | 764 | 3 |  |  |  |  |  |  | **767** |
| Laboratory mammals, other |  |  |  |  |  |  | 1144 |  |  |  | **1144** |
| Lizards |  |  | 1570 | 10 |  |  | 78 |  |  | 1264 | **2922** |
| Macaques | 86 |  |  |  |  |  |  |  |  |  | **86** |
| Macropods |  |  | 950 | 73 |  |  | 237 |  |  | 3 | **1263** |
| Marmosets | 95 |  |  |  |  |  |  |  |  |  | **95** |
| Mice (lab) | 397 071 | 1206 |  |  |  |  |  |  |  |  | **398 277** |
| Mice (wild) |  |  | 480 |  |  |  |  |  |  |  | **480** |
| Monotremes |  |  | 82 | 14 |  |  |  |  |  |  | **96** |
| Native mammals, other |  |  | 126 021 | 3 |  | 8 |  |  |  |  | **126 032** |
| Native rats, mice |  |  | 796 |  |  | 29 |  |  |  | 26 | **851** |
| Pigs (domestic) |  |  |  |  | 725 |  | 171 |  | 5953 |  | **6849** |
| Possums, gliders |  |  | 2362 |  |  | 6 |  |  |  | 4 | **2372** |
| Poultry |  |  |  |  | 17 780 | 76 | 4032 |  | 31 |  | **21 919** |
| Rabbits (lab) | 1464 |  |  |  |  |  |  |  |  |  | **1464** |
| Rabbits (wild) |  |  | 1121 |  |  | 11 |  |  |  |  | **1132** |
| Rats (lab) | 23 378 | 753 |  |  |  |  |  |  |  |  | **24 131** |
| Rats (wild) |  |  | 385 |  |  |  | 26 |  |  |  | **411** |
| Reptiles, other |  |  | 52 |  |  |  |  |  |  |  | **52** |
| Seals, sealions |  |  | 104 |  |  |  |  |  |  |  | **104** |
| Sheep (domestic) |  |  |  |  | 2352 | 19 | 1885 |  | 81 421 |  | **85 677** |
| Snakes |  |  | 68 |  |  |  |  |  |  | 2 | **70** |
| Turtles, tortoises |  |  | 162 |  |  |  |  |  |  | 1 | **163** |
| Whales, dolphins |  |  | 106 |  |  |  |  |  |  |  | **106** |
| Wombats |  |  | 134 |  |  |  |  |  |  |  | **134** |
| Total | **426 034** | **1981** | **366 830** | **493** | **42263** | **3487** | **98 151** | **285** | **109 888** | **30 724** | **1 080 136** |

### Table 2.3: Number of animals used, by animal type and procedure type, 2016

| Animal Type | Procedure type | | | | | | | | | | | | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Aversive stimuli | Central nervous system | Genetic modification | Immuno-modulatory methods | Infection induction | Ionising radiation | Long term attachment/ insertion | Monoclonal antibody production | Neoplasia | Neuromuscular block, electro-immobilisation | Other disease | Polyclonal antibody production | Skin irritancy | Toxicity | Other procedure |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Amphibians |  |  |  | 111 |  |  |  |  |  |  |  |  |  |  | 3602 | **3713** |
| Birds (exotic captive) |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | **10** |
| Birds (exotic wild) |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 187 | **187** |
| Birds (native captive) | 15 |  |  |  |  |  |  |  |  |  |  |  |  |  | 559 | **574** |
| Birds (native wild) |  |  |  |  |  |  | 10 632 |  |  |  |  |  |  |  | 36 070 | **46 702** |
| Birds, other |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 163 | **163** |
| Cats (non-wild) |  |  |  | 25 | 10 |  | 43 |  |  | 2 | 5 |  |  | 2 | 510 | **597** |
| Cats (wild) |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 31 | **31** |
| Cattle (domestic) | 3291 |  |  | 353 | 140 |  | 271 |  |  |  |  | 18 |  | 32 | 17 715 | **21 820** |
| Cattle (wild) |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 | **2** |
| Cephalopods |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 99 | **99** |
| Crustaceans |  |  |  |  |  |  | 8040 |  |  |  |  |  |  |  | 11 640 | **19 680** |
| Dasyurids | 7 |  |  |  |  |  | 4 |  |  |  |  |  |  |  | 2304 | **2315** |
| Dogs (non-wild) |  |  |  | 84 |  |  | 2 |  |  |  |  | 6 |  | 6 | 2847 | **2945** |
| Dogs, foxes (wild) |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 110 | **110** |
| Domestic mammals, other |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 147 | **147** |
| Exotic feral mammals, other |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 154 | **154** |
| Exotic zoo mammals |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 31 | **31** |
| Ferrets (lab) |  |  |  |  | 2077 |  |  |  |  |  |  |  |  |  | 2 | **2079** |
| Fish | 1419 |  | 68 238 |  |  |  | 4520 |  | 330 |  | 1318 |  |  | 1395 | 217 730 | **294 950** |
| Goats (domestic) |  |  |  |  | 165 |  |  |  |  |  |  | 10 |  |  | 2361 | **2536** |
| Guinea pigs (lab) |  | 5 |  | 24 | 599 |  | 206 |  |  |  | 30 | 4 |  | 152 | 2942 | **3962** |
| Hares (wild) |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 28 | **28** |
| Horses (domestic) |  |  |  | 75 |  | 36 | 3 |  |  |  |  | 66 |  | 6 | 518 | **704** |
| Koalas |  |  |  |  |  |  | 108 |  |  |  |  |  |  |  | 659 | **767** |
| Laboratory mammals, other |  |  |  | 155 |  |  |  |  |  |  |  |  |  |  | 989 | **1144** |
| Lizards |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2922 | **2922** |
| Macaques |  | 2 |  |  | 39 |  | 8 |  |  | 1 |  |  |  | 12 | 24 | **86** |
| Macropods |  |  |  |  |  |  | 94 |  |  |  |  |  |  |  | 1169 | **1263** |
| Marmosets |  | 71 |  |  |  |  | 1 |  |  |  |  |  |  |  | 23 | **95** |
| Mice (lab) | 2466 | 6875 | 62 767 | 18 924 | 51 280 | 10 804 | 787 | 363 | 41 317 |  | 46 491 | 397 | 4 | 1604 | 154 198 | **398 277** |
| Mice (wild) |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 480 | **480** |
| Monotremes |  |  |  |  |  |  | 31 |  |  |  |  |  |  |  | 65 | **96** |
| Native mammals, other |  |  |  |  |  |  | 622 |  |  |  |  |  |  |  | 125 410 | **126 032** |
| Native rats, mice |  |  |  |  |  |  | 14 |  |  |  |  |  |  |  | 837 | **851** |
| Pigs (domestic) |  |  | 91 | 128 | 103 |  | 19 |  |  |  |  |  |  | 40 | 6468 | **6849** |
| Possums, gliders |  |  |  |  |  |  | 31 |  |  |  |  |  |  |  | 2341 | **2372** |
| Poultry |  |  | 2282 | 851 | 14 389 |  |  | 6 |  |  | 214 | 108 |  |  | 4069 | **21 919** |
| Rabbits (lab) |  |  |  | 597 | 8 |  |  | 24 |  |  | 85 | 198 |  |  | 552 | **1464** |
| Rabbits (wild) |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1132 | **1132** |
| Rats (lab) | 1726 | 1674 | 470 |  | 68 | 12 | 1231 | 76 | 54 |  | 4890 | 6 |  | 386 | 13 538 | **24 131** |
| Rats (wild) |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 411 | **411** |
| Reptiles, other |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 52 | **52** |
| Seals, sealions |  |  |  |  |  |  | 6 |  |  |  |  |  |  |  | 98 | **104** |
| Sheep (domestic) |  | 18 | 4 | 6 | 283 |  | 369 | 10 |  |  | 330 | 8 |  | 110 | 84 539 | **85 677** |
| Snakes |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 70 | **70** |
| Turtles, tortoises |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  | 162 | **163** |
| Whales, dolphins |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 106 | **106** |
| Wombats |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 134 | **134** |
| Total | **8924** | **8645** | **133 852** | **21 333** | **69 161** | **10 852** | **27 053** | **479** | **41 701** | **3** | **53 363** | **821** | **4** | **3745** | **700 200** | **1 080 136** |

### Table 2.4: Number of animals used, by animal type and procedure impact, 2016

| Animal Type | Procedure impact | | | | | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Animal unconscious without recovery | Observational study, minor interference | Minor intervention, no anaesthesia | Minor operative procedure with recovery | Minor physiological challenge | Surgery with recovery | Major physiological challenge | Death as an end point |  |
|  |  |  |  |  |  |  |  |  |  |
| Amphibians | 588 | 1244 | 1123 | 44 | 603 | 111 |  |  | **3713** |
| Birds (exotic captive) |  |  |  |  |  | 10 |  |  | **10** |
| Birds (exotic wild) |  | 45 | 42 |  | 100 |  |  |  | **187** |
| Birds (native captive) | 23 | 208 | 69 | 28 | 246 |  |  |  | **574** |
| Birds (native wild) |  | 32 905 | 13732 | 62 |  | 3 |  |  | **46 702** |
| Birds, other | 8 | 155 |  |  |  |  |  |  | **163** |
| Cats (non-wild) | 10 | 214 | 148 | 91 |  | 109 | 25 |  | **597** |
| Cats (wild) |  | 31 |  |  |  |  |  |  | **31** |
| Cattle (domestic) | 4 | 17 591 | 3337 | 124 | 624 |  | 140 |  | **21 820** |
| Cattle (wild) |  | 2 |  |  |  |  |  |  | **2** |
| Cephalopods | 4 | 2 | 93 |  |  |  |  |  | **99** |
| Crustaceans | 187 | 1823 | 9144 | 8085 | 441 |  |  |  | **19 680** |
| Dasyurids | 21 | 1350 | 944 |  |  |  |  |  | **2315** |
| Dogs (non-wild) | 9 | 1909 | 681 | 228 | 98 | 20 |  |  | **2945** |
| Dogs, foxes (wild) |  | 110 |  |  |  |  |  |  | **110** |
| Domestic mammals, other |  | 66 | 32 | 49 |  |  |  |  | **147** |
| Exotic feral mammals, other |  | 20 | 134 |  |  |  |  |  | **154** |
| Exotic zoo mammals |  | 28 | 3 |  |  |  |  |  | **31** |
| Ferrets (lab) |  | 2 |  | 26 | 1981 |  | 70 |  | **2079** |
| Fish | 10 803 | 169 584 | 79 390 | 4976 | 22 447 | 145 | 7605 |  | **294 950** |
| Goats (domestic) |  | 1325 | 1211 |  |  |  |  |  | **2536** |
| Guinea pigs (lab) | 270 | 503 | 5 | 23 | 4 | 188 | 1826 | 1143 | **3962** |
| Hares (wild) | 20 | 8 |  |  |  |  |  |  | **28** |
| Horses (domestic) |  | 156 | 351 | 28 | 114 | 5 | 50 |  | **704** |
| Koalas |  | 659 | 108 |  |  |  |  |  | **767** |
| Laboratory mammals, other |  | 355 | 622 | 167 |  |  |  |  | **1144** |
| Lizards | 82 | 387 | 2310 | 4 | 139 |  |  |  | **2922** |
| Macaques | 6 | 10 |  | 54 |  | 16 |  |  | **86** |
| Macropods | 170 | 827 | 176 | 26 | 47 | 17 |  |  | **1263** |
| Marmosets | 8 |  |  |  |  | 87 |  |  | **95** |
| Mice (lab) | 75 326 | 45 627 | 89 864 | 28 873 | 48 963 | 34 995 | 68 875 | 5754 | **398 277** |
| Mice (wild) | 3 | 127 | 350 |  |  |  |  |  | **480** |
| Monotremes |  | 65 | 31 |  |  |  |  |  | **96** |
| Native mammals, other |  | 123 959 | 2064 | 9 |  |  |  |  | **126 032** |
| Native rats, mice |  | 189 | 662 |  |  |  |  |  | **851** |
| Pigs (domestic) | 88 | 266 | 5877 | 56 | 482 | 41 | 39 |  | **6849** |
| Possums, gliders | 17 | 1960 | 383 | 12 |  |  |  |  | **2372** |
| Poultry | 9601 | 818 | 5638 |  | 3832 |  | 2030 |  | **21 919** |
| Rabbits (lab) | 1011 | 17 | 69 | 64 | 30 | 84 | 189 |  | **1464** |
| Rabbits (wild) | 320 | 72 | 740 |  |  |  |  |  | **1132** |
| Rats (lab) | 8793 | 920 | 2104 | 2826 | 1571 | 7487 | 430 |  | **24 131** |
| Rats (wild) |  | 288 | 123 |  |  |  |  |  | **411** |
| Reptiles, other |  | 52 |  |  |  |  |  |  | **52** |
| Seals, sealions |  |  | 98 | 6 |  |  |  |  | **104** |
| Sheep (domestic) | 2002 | 47 654 | 29 789 | 1078 | 4260 | 650 | 244 |  | **85 677** |
| Snakes | 11 | 21 | 38 |  |  |  |  |  | **70** |
| Turtles, tortoises |  | 162 | 1 |  |  |  |  |  | **163** |
| Whales, dolphins |  | 106 |  |  |  |  |  |  | **106** |
| Wombats |  | 129 | 5 |  |  |  |  |  | **134** |
| Total | **109 385** | **453 951** | **251 491** | **46 939** | **85 982** | **43 968** | **81 523** | **6897** | **1 080 136** |

### Table 2.5: Number of animals used, by animal type and project benefit, 2016

| Animal Type | Project benefit | | | | | | | | | | | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Biological products | Biology/ physiology | Demonstration | Diseases, animal | Diseases, human | Diseases, zoonotic | Domestic animal management | Environment | Pest management | Regulatory testing | Technique development | Training | Wildlife management | Xenotrans- plantation |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Amphibians |  | 650 | 88 |  | 44 |  |  | 1009 |  |  | 49 | 13 | 1860 |  | **3713** |
| Birds (exotic captive) |  | 10 |  |  |  |  |  |  |  |  |  |  |  |  | **10** |
| Birds (exotic wild) |  | 100 |  |  |  |  |  |  |  |  |  |  | 87 |  | **187** |
| Birds (native captive) |  | 401 |  |  |  |  |  | 6 |  |  | 5 | 113 | 49 |  | **574** |
| Birds (native wild) |  | 980 | 17 | 359 |  | 411 |  | 16 993 |  |  | 702 | 479 | 26 761 |  | **46 702** |
| Birds, other |  |  |  | 8 |  |  |  |  |  |  |  |  | 155 |  | **163** |
| Cats (non-wild) |  | 54 | 124 | 83 | 18 | 61 | 33 |  |  | 35 |  | 184 | 5 |  | **597** |
| Cats (wild) |  |  |  |  |  |  |  | 2 |  |  |  |  | 29 |  | **31** |
| Cattle (domestic) | 10 | 91 | 42 | 7447 |  | 205 | 11 002 |  |  | 142 |  | 2881 |  |  | **21 820** |
| Cattle (wild) |  |  |  |  |  |  |  |  |  |  |  |  | 2 |  | **2** |
| Cephalopods |  | 10 | 11 |  |  |  |  |  |  |  |  |  | 78 |  | **99** |
| Crustaceans |  | 40 | 1280 |  |  |  |  | 2077 |  |  |  |  | 16 283 |  | **19 680** |
| Dasyurids |  | 91 | 4 |  |  |  |  | 1140 |  |  | 13 | 18 | 1049 |  | **2315** |
| Dogs (non-wild) | 1 | 281 | 97 | 1106 |  |  | 38 | 17 |  | 73 | 36 | 1296 |  |  | **2945** |
| Dogs, foxes (wild) |  |  |  |  |  |  |  | 2 |  |  | 1 |  | 107 |  | **110** |
| Domestic mammals, other |  |  | 29 |  |  |  |  | 1 |  |  |  | 117 |  |  | **147** |
| Exotic feral mammals, other |  |  |  |  |  |  |  | 134 |  |  | 9 |  | 11 |  | **154** |
| Exotic zoo mammals |  |  |  | 14 |  |  |  |  |  |  | 3 |  | 14 |  | **31** |
| Ferrets (lab) |  | 2 |  | 6 | 1997 | 74 |  |  |  |  |  |  |  |  | **2079** |
| Fish |  | 86862 | 265 |  | 4621 |  | 2130 | 183 397 |  |  | 9 | 1537 | 16129 |  | **294 950** |
| Goats (domestic) |  | 10 | 3 | 165 |  | 1570 | 788 |  |  |  |  |  |  |  | **2536** |
| Guinea pigs (lab) |  | 316 | 4 | 813 | 2761 |  | 22 |  |  | 4 | 10 | 32 |  |  | **3962** |
| Hares (wild) |  |  |  | 20 |  |  |  |  |  |  |  |  | 8 |  | **28** |
| Horses (domestic) | 72 | 24 | 6 | 164 | 43 |  | 36 |  |  | 59 | 41 | 259 |  |  | **704** |
| Koalas |  |  |  |  |  |  |  | 483 |  |  |  |  | 284 |  | **767** |
| Laboratory mammals, other |  | 989 |  |  | 155 |  |  |  |  |  |  |  |  |  | **1144** |
| Lizards |  | 1322 | 7 |  |  |  |  | 817 |  |  | 83 | 7 | 686 |  | **2922** |
| Macaques | 5 | 27 |  |  | 42 |  |  |  |  | 12 |  |  |  |  | **86** |
| Macropods |  | 237 | 56 | 14 |  | 1 |  | 290 |  |  | 31 | 35 | 599 |  | **1263** |
| Marmosets | 7 | 88 |  |  |  |  |  |  |  |  |  |  |  |  | **95** |
| Mice (lab) | 244 | 127 792 | 430 | 10 104 | 240 242 | 1368 | 9403 |  |  |  | 1804 | 6090 |  | 800 | **398 277** |
| Mice (wild) |  |  |  |  |  |  |  | 54 | 131 |  |  | 3 | 292 |  | **480** |
| Monotremes |  |  |  |  |  |  |  | 9 |  |  |  |  | 87 |  | **96** |
| Native mammals, other |  | 45 |  | 222 |  | 8 |  | 124 983 |  |  | 63 | 1 | 710 |  | **126 032** |
| Native rats, mice |  |  | 24 |  | 26 |  |  | 405 |  |  | 5 | 30 | 361 |  | **851** |
| Pigs (domestic) |  | 59 | 8 | 252 | 179 | 19 | 5974 |  |  | 180 | 18 | 160 |  |  | **6849** |
| Possums, gliders |  |  | 18 |  |  | 17 |  | 49 |  |  | 58 |  | 2230 |  | **2372** |
| Poultry | 8195 | 1343 | 452 | 3670 | 1048 | 1875 | 267 |  |  | 4753 | 152 | 164 |  |  | **21 919** |
| Rabbits (lab) | 175 | 425 |  | 609 | 230 |  |  |  |  |  |  | 25 |  |  | **1464** |
| Rabbits (wild) |  |  |  |  |  |  | 11 | 1 | 1060 |  | 14 |  | 46 |  | **1132** |
| Rats (lab) | 99 | 8207 | 49 | 87 | 14 416 |  | 20 |  |  | 18 | 10 | 1225 |  |  | **24 131** |
| Rats (wild) |  |  |  |  |  |  |  | 2 |  |  | 1 | 1 | 407 |  | **411** |
| Reptiles, other |  |  |  |  |  |  |  |  |  |  |  |  | 52 |  | **52** |
| Seals, sealions |  |  |  |  |  |  |  |  |  |  |  |  | 104 |  | **104** |
| Sheep (domestic) | 1835 | 870 | 47 | 7157 | 794 | 162 | 52 879 | 15 |  | 943 | 1827 | 19 148 |  |  | **85 677** |
| Snakes | 2 |  |  |  |  |  |  | 35 |  |  | 8 |  | 25 |  | **70** |
| Turtles, tortoises |  |  |  |  |  |  |  | 72 |  |  |  |  | 91 |  | **163** |
| Whales, dolphins |  |  |  |  |  |  |  |  |  |  |  |  | 106 |  | **106** |
| Wombats |  |  |  |  |  |  |  | 103 |  |  | 14 |  | 17 |  | **134** |
| Total | **10 645** | **23 1326** | **3061** | **32 300** | **266 616** | **5771** | **82 603** | **332 096** | **1191** | **6219** | **4966** | **33 818** | **68 724** | **800** | **1 080 136** |

### Table 2.6: Number of animals used, by animal type and deaths, 2016

| Animal Type | Animal death | | | Total animals |
| --- | --- | --- | --- | --- |
|  | Death as an endpoint | Other deaths | Total deaths |  |
|  |  |  |  |  |
| Amphibians |  | 1445 | 1445 | **3713** |
| Birds (exotic captive) |  |  |  | **10** |
| Birds (exotic wild) |  |  |  | **187** |
| Birds (native captive) |  | 188 | 188 | **574** |
| Birds (native wild) |  | 38 | 38 | **46 702** |
| Birds, other |  | 8 | 8 | **163** |
| Cats (non-wild) |  | 73 | 73 | **597** |
| Cats (wild) |  |  |  | **31** |
| Cattle (domestic) |  | 114 | 114 | **21 820** |
| Cattle (wild) |  |  |  | **2** |
| Cephalopods |  | 81 | 81 | **99** |
| Crustaceans |  | 11 102 | 11 102 | **19 680** |
| Dasyurids |  | 96 | 96 | **2315** |
| Dogs (non-wild) |  | 228 | 228 | **2945** |
| Dogs, foxes (wild) |  |  |  | **110** |
| Domestic mammals, other |  | 4 | 4 | **147** |
| Exotic feral mammals, other |  |  |  | **154** |
| Exotic zoo mammals |  |  |  | **31** |
| Ferrets (lab) |  | 484 | 484 | **2079** |
| Fish |  | 85 832 | 85 832 | **294 950** |
| Goats (domestic) |  | 63 | 63 | **2536** |
| Guinea pigs (lab) | 1143 | 2776 | 3919 | **3962** |
| Hares |  | 20 | 20 | **28** |
| Horses (domestic) |  | 12 | 12 | **704** |
| Koalas |  | 6 | 6 | **767** |
| Laboratory mammals, other |  | 1035 | 1035 | **1144** |
| Lizards |  | 276 | 276 | **2922** |
| Macaques |  | 49 | 49 | **86** |
| Macropods |  | 203 | 203 | **1263** |
| Marmosets |  | 73 | 73 | **95** |
| Mice (lab) | 5754 | 342 053 | 347 807 | **398 277** |
| Mice (wild) |  | 3 | 3 | **480** |
| Monotremes |  |  |  | **96** |
| Native mammals, other |  | 2 | 2 | **126 032** |
| Native rats, mice |  | 2 | 2 | **851** |
| Pigs (domestic) |  | 361 | 361 | **6849** |
| Possums, gliders |  | 19 | 19 | **2372** |
| Poultry |  | 20 344 | 20 344 | **21 919** |
| Rabbits (lab) |  | 1319 | 1319 | **1464** |
| Rabbits (wild) |  | 1060 | 1060 | **1132** |
| Rats (lab) |  | 21 593 | 21 593 | **24 131** |
| Rats (wild) |  |  |  | **411** |
| Reptiles, other |  |  |  | **52** |
| Seals, sealions |  |  |  | **104** |
| Sheep (domestic) |  | 4205 | 4205 | **85 677** |
| Snakes |  | 11 | 11 | **70** |
| Turtles, tortoises |  |  |  | **163** |
| Whales, dolphins |  |  |  | **106** |
| Wombats |  |  |  | **134** |
| Total | **6897** | **494 978** | **501 875** | **1 080 136** |

### Table 2.7: Number of animals used, by project benefit and project purpose, 2016

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Project benefit | Procedure impact | | | | | Total |
| **Educational objectives** | **Environmental objectives** | **Improvement of animal management/production** | **Maintenance/improvement of human/animal health/welfare** | **Understanding of human/animal biology** |  |
| Biological products | 65 |  | 679 | 9460 | 441 | **10 645** |
| Biology/physiology | 3042 | 200 | 1046 | 6852 | 220 186 | **231 326** |
| Demonstration | 2262 | 450 | 322 | 27 |  | **3061** |
| Diseases, animal | 5581 | 20 | 18 | 25 002 | 1679 | **32 300** |
| Diseases, human |  |  | 1393 | 106 025 | 159 198 | **266 616** |
| Diseases, zoonotic |  |  |  | 4337 | 1434 | **5771** |
| Domestic animal management | 123 |  | 68 513 | 11 557 | 2410 | **82 603** |
| Environment | 4634 | 176 181 | 6907 | 13 894 | 130 480 | **332 096** |
| Pest management |  | 871 | 320 |  |  | **1191** |
| Regulatory testing |  |  | 3669 | 2550 |  | **6219** |
| Technique development | 2155 |  | 2058 | 659 | 94 | **4966** |
| Training | 33 730 |  | 2 | 85 | 1 | **33 818** |
| Wildlife management | 179 | 41 091 | 24 193 | 1591 | 1670 | **68 724** |
| Xenotransplantation |  |  |  |  | 800 | **800** |
| Total | **51 771** | **218 813** | **109 120** | **182 039** | **518 393** | **1 080 136** |

### Table 2.8: Number of animals used, by procedure impact and project purpose, 2016

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Procedure impact | Project purpose | | | | | Total | |
| **Educational objectives** | **Environmental objectives** | **Improvement of animal management/production** | **Maintenance/improvement of human/animal health/welfare** | **Understanding of human/animal biology** |  |
| Animal unconscious without recovery | 5945 | 1948 | 1369 | 25 049 | 75 076 | **109 397** |
| Observational study, minor interference | 36 515 | 123 657 | 34 192 | 33 944 | 225 643 | **453 941** |
| Minor intervention,  no anaesthesia | 5595 | 83 340 | 57 451 | 28 586 | 76 517 | **251 489** |
| Minor operative procedure with recovery | 2433 | 451 | 10 015 | 13 487 | 20 553 | **46 939** |
| Minor physiological challenge | 165 | 9060 | 4988 | 21 247 | 50 522 | **85 982** |
| Surgery with recovery | 87 | 157 | 137 | 20 740 | 22 847 | **43 968** |
| Major physiological challenge | 1031 | 200 | 968 | 32 089 | 47 235 | **81 523** |
| Death as an end point |  |  |  | 6897 |  | **6897** |
| Total | **51 771** | **218 813** | **109 120** | **182 039** | **518 393** | **1 080 136** |

### Table 2.9: Number of animals used, by procedure type and project purpose, 2016

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Procedure type | Project purpose | | | | | Total |
| **Educational objectives** | **Environmental objectives** | **Improvement of animal management/production** | **Maintenance/improve-ment of human/animal health/welfare** | **Understanding of human/animal biology** |  |
| Aversive stimuli | 36 |  | 7 | 3533 | 5348 | **8924** |
| Central nervous system | 54 |  |  | 1603 | 6988 | **8645** |
| Genetic modification | 119 |  | 1168 | 28 370 | 104 195 | **133 852** |
| Immunomodulatory methods |  |  |  | 7664 | 13669 | **21 333** |
| Infection induction |  |  | 2953 | 35 581 | 30 627 | **69 161** |
| Ionising radiation |  |  |  | 3013 | 7839 | **10 852** |
| Long term attachment/insertion | 4545 | 10 843 | 8 161 | 867 | 2637 | **27 053** |
| Monoclonal antibody production |  |  |  | 88 | 391 | **479** |
| Neoplasia |  |  |  | 9914 | 31787 | **41 701** |
| Neuromuscular block, electro-immobilisation |  |  |  |  | 3 | **3** |
| Other disease | 120 | 15 | 323 | 17 398 | 35 507 | **53 363** |
| Polyclonal antibody production |  |  |  | 479 | 342 | **821** |
| Skin irritancy |  |  |  |  | 4 | **4** |
| Toxicity |  | 276 | 900 | 1433 | 1136 | **3745** |
| Other | 46 897 | 207 679 | 95 608 | 72 096 | 277 920 | **700 200** |
| Total | **51 771** | **218 813** | **109 120** | **182 039** | **518 393** | **1 080 136** |

### Table 2.10: Number of animals used by animal source and project purpose, 2016

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Animal source | Project purpose | | | |  | | Total |
| **Educational objectives** | **Environmental objectives** | **Improved animal management/production** | **Maintenance/improvement human/animal health/welfare** | | **Understanding of human/animal biology** |  |
| Specified animal supplier | 11 021 | 15 | 10 822 | 116 602 | | 287 574 | **426 034** |
| Other specified animal source | 22 |  |  | 82 | | 1877 | **1981** |
| Animals in their natural habitat | 6654 | 216 076 | 1156 | 15 790 | | 127 154 | **366 830** |
| Animals removed from natural habitat | 389 | 2217 | 17183 | 201 | | 10 734 | **30 724** |
| Colony/zoo |  | 245 | 40 | 81 | | 127 | **493** |
| Commercial supplier | 3007 | 206 | 16744 | 16 916 | | 5390 | **42 263** |
| Own derivation | 2491 |  | 3792 | 7197 | | 84671 | **98 151** |
| Private donation | 167 |  |  | 95 | | 23 | **285** |
| Private animals on farm | 26 233 | 24 | 59 299 | 24 285 | | 47 | **109 888** |
| Other | 1787 | 30 | 84 | 790 | | 796 | **3487** |
| Total | **51 771** | **218 813** | **109 120** | **182 039** | | **518 393** | **1 080 136** |

### Table 2.11: Number of animals used, by project benefit and procedure impact, 2016

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Project benefit | Procedure impact | | | | | | | | Total |
| **Animal unconscious without recovery** | **Observational study, minor interference** | **Minor intervention, no anaesthesia** | **Minor operative procedure with recovery** | **Minor physiological challenge** | **Surgery with recovery** | **Major physiological challenge** | **Death as an end point** |  |
| Biological products | 8007 | 65 | 1572 | 214 | 377 |  | 410 |  | **10 645** |
| Biology/physiology | 47 927 | 75 064 | 38 872 | 7204 | 33 006 | 4548 | 24 705 |  | **23 1326** |
| Demonstration | 203 | 1914 | 559 | 10 | 348 | 27 |  |  | **3061** |
| Diseases, animal | 1376 | 13 892 | 4137 | 98 | 1827 | 2 | 7835 | 3133 | **32 300** |
| Diseases, human | 41 538 | 30 914 | 47 205 | 26 712 | 32 329 | 38 336 | 45 818 | 3764 | **266 616** |
| Diseases, zoonotic | 65 | 871 | 3036 | 4 | 422 |  | 1373 |  | **5771** |
| Domestic animal management | 1804 | 33 408 | 43 649 | 81 | 3608 | 53 |  |  | **82 603** |
| Environment | 1543 | 247 696 | 72 468 | 1129 | 9060 |  | 200 |  | **332 096** |
| Pest management | 320 |  | 871 |  |  |  |  |  | **1191** |
| Regulatory testing | 1685 | 189 | 1571 | 16 | 2715 | 18 | 25 |  | **6219** |
| Technique development | 249 | 1230 | 304 | 1782 | 1261 | 105 | 35 |  | **4966** |
| Training | 3151 | 23 302 | 4785 | 1386 | 77 | 86 | 1031 |  | **33 818** |
| Wildlife management | 1529 | 26 495 | 31 220 | 8303 | 952 | 157 | 68 |  | **68 724** |
| Xenotransplantation |  |  | 141 |  |  | 636 | 23 |  | **800** |
| Total | **109 397** | **455 040** | **250 390** | **46 939** | **85 982** | **43 968** | **81 523** | **6897** | **1 080 136** |

### Table 2.12: Number of animals used, by procedure impact and procedure type, 2016

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Procedure type | Procedure impact | | | | | | | | Total |
| **Animal unconscious without recovery** | **Observational study, minor interference** | **Minor intervention, no anaesthesia** | **Minor operative procedure with recovery** | **Minor physiological challenge** | **Surgery with recovery** | **Major physiological challenge** | **Death as an end point** |  |
| Aversive stimuli | 1298 | 5160 | 1170 | 182 | 437 | 677 |  |  | **8924** |
| Central nervous system | 467 | 356 | 736 | 568 | 77 | 2881 | 3560 |  | **8645** |
| Genetic modification | 8424 | 58 514 | 30 383 | 4547 | 11814 | 13886 | 6284 |  | **133 852** |
| Immunomodulatory methods | 3516 | 1084 | 7819 | 724 | 5921 | 233 | 2036 |  | **21 333** |
| Infection induction | 9415 | 927 | 2023 | 3238 | 29 103 | 46 | 21276 | 3133 | **69 161** |
| Ionising radiation | 172 | 52 | 112 | 996 | 197 | 24 | 9299 |  | **10 852** |
| Long term attachment/insertion | 42 | 4636 | 19604 | 165 | 49 | 2554 | 3 |  | **27 053** |
| Monoclonal antibody production | 54 | 52 | 88 |  |  |  | 285 |  | **479** |
| Neoplasia | 268 | 2626 | 4220 | 5418 | 5993 | 3530 | 19 646 |  | **41 701** |
| Neuromuscular block, electro-immobilisation | 3 |  |  |  |  |  |  |  | **3** |
| Other disease | 5566 | 3719 | 7956 | 7101 | 7879 | 12 207 | 8935 |  | **53 363** |
| Polyclonal antibody production | 4 | 6 | 156 | 165 | 275 |  | 215 |  | **821** |
| Skin irritancy |  |  |  |  |  |  | 4 |  | **4** |
| Toxicity | 298 | 619 | 33 | 28 | 1041 |  | 1726 |  | **3745** |
| Other | 79 858 | 376 200 | 177 191 | 23 807 | 23196 | 7930 | 8254 | 3764 | **700 200** |
| Total | **109 385** | **453 951** | **251 491** | **46 939** | **85 982** | **43 968** | **81 523** | **6897** | **1 080 136** |