

Welfare of laboratory animals under threat

THE 2009 laboratory animal use statistics for Great Britain were recently published by the Home Office.

Just over 3.6 million scientific procedures were conducted on animals in 2009, a reduction of around 1% compared with the previous year. Some 3.5 million animals were used for the first time, also a fall of 1%. The number of procedures is always higher than animal numbers, due to re-use of some animals.

Although these very slight declines are encouraging for animal welfare, they must nevertheless be kept in perspective. They followed six successive annual increases, with the result that these totals remain the second highest since the current method of recording was introduced in 1987 – more than two decades ago.

It was particularly encouraging to see an overall reduction in the use of primates by 7%, although New World primate use increased very substantially.

The advanced emotional, psychological and social capacities of primates markedly increase their risks of suffering within laboratory environments and procedures. They have advanced capacities to understand and remember that certain people, tools or procedures are likely to cause pain and distress, and their ability to anticipate future aversive experiences is likely to compound the distress such events may cause. Disturbingly, around 30% of all EU primate experiments occur within the UK.

Even more disturbing was the steadily increasing use of genetically altered animals, which exceeded the number of normal animals used for the first time. Fifty-two per cent of procedures involved animals that were genetically altered, of which a large proportion were used for breeding.

The production of genetically modified strains involves surgical procedures and significant physiological challenges. It is also an inherently inefficient process, frequently resulting in a high proportion of discarded animals, with the welfare of the

survivors more likely to be adversely affected than for non-GM strains.

With respect to animal suffering, Home Office Minister Lynne Featherstone stated when commenting on these figures: “We ensure procedures are only carried out where completely necessary, and that suffering is kept to an absolute minimum.”

However, in 2009, 67% of all procedures did not utilise any form of anaesthesia – an increase of 2% compared to 2008. From 1988 to 2008, the proportion of such procedures fluctuated from approximately 59 to 69%. Analgesic use was not reported.

Whilst anaesthetic and analgesic use undoubtedly alters normal physiology, claims that such alterations are sufficiently important to

hypotheses under investigation to warrant their exclusion, require careful scrutiny.

Despite increasing recognition that pain relief improves both animal welfare and research quality – via minimisation of pain-related physiological, psychological and behavioural distortions – pain monitoring and analgesic provision remains less than optimal within many research protocols.

A wide variety of stressors have the potential to cause significant stress and fear in laboratory animals. These may be associated with the capture of wild-sourced species (mainly primates) used to supply laboratories or breeding centres, transportation (which may be very prolonged for some animals), laboratory housing and environments, and both routine and invasive laboratory procedures.

Studies have clearly demonstrated that the stress caused by laboratory housing and environments, routine laboratory procedures, and in all likelihood other stressors such as those associated with wild capture, transportation and invasive procedures, may result in profound, statistically-significant distortions in a range of physiological parameters, including cardiovascular parameters and serum concentrations of glucose and various hormones.

Behaviour may be markedly altered, and behavioural stereotypies and increased aggression may develop over time, as may alterations in certain neuro-anatomical parameters, and even cognitive capacities.

Unsurprisingly, the chronic stress

experienced by most laboratory animals may result in immunocompromisation and increased susceptibility to a range of pathologies. As well as creating significant animal welfare and ethical problems, such conditions and their effects on laboratory animals may also distort a wide range of experimental outcomes, such as those dependent on accurate determination of physiological, behavioural or cognitive characteristics.

To further assess the suffering experienced by laboratory animals, it would be helpful to know the levels of analgesic use, of correlation between markedly invasive procedures and anaesthetic or analgesic use, and of environmental enrichment and socialisation opportunities.

Unfortunately, however, such data remain unreported.

Important and recent legislative developments are unlikely to rectify most of these deficiencies. In September, the European Parliament adopted an updated text to replace European Directive 86/609/EEC on the protection of animals used for scientific purposes, which had governed European laboratory animal use for more than two decades.

Although weakened considerably in comparison to earlier drafts, in most respects and for many European countries the new Directive will nevertheless strengthen the protection of animals used for scientific purposes.

Ethical evaluation

It explicitly requires systematic, compulsory ethical evaluation and authorisation of scientific protocols. Likely harms to animals must be balanced against the scientific or educational validity, usefulness and relevance of the expected result, and 3Rs strategies must be utilised wherever “possible” – a concept that is notoriously open to interpretation and that unfortunately remains widely abused.

The scope of the Directive is also broadened. Protection is extended from living vertebrates to include mammalian foetuses in their last trimester of gestation, independently feeding larval forms, cephalopods, and animals bred for organ-harvesting.

The use of non-human primates is restricted – particularly in the case of Great Apes – although not prohibited. However, the latter may be used only in the case of an unexpected outbreak of a life-threatening or debilitating human disease, or when the survival of the species itself is at stake.

Notably, the new Directive specifies an upper limit of pain, suffering and distress, above which animal use is not normally permissible. Procedures



Beagles used in research kept in an enriched enclosure.

resulting in severe pain, suffering or distress, which is likely to be long-lasting and unable to be ameliorated, are largely, although not entirely, prohibited.

European Member States will have 24 months to adopt and publish national legislation which will transpose the provisions of this Directive. The latter will become effective on 1st January, 2013. However, the Directive is weaker in some respects than existing UK legislation, so to safeguard the welfare of laboratory animals in the UK it will be important to ensure the latter is not watered down to meet “bare minimum” European requirements.

Additionally, the Comprehensive Spending Review of Science currently being undertaken by the coalition government is expected to reduce the amount of funding available, which could adversely affect the ongoing development of alternative research and testing strategies, as well as the care and welfare of animals used in UK laboratories.

The welfare of UK laboratory animals is, therefore, under threat from several directions. However, as well as being least able to speak up for themselves, these animals are within the sector of society least responsible for our current economic crisis.

To ensure they do not pay a heavier price than those actually responsible for it, the veterinary profession must emphasise to our government the significant importance of good animal welfare to society at large. We must clearly make the point that weakening of UK minimum standards for laboratory animals is not an acceptable option for mitigating our economic woes.



Toxins are applied to rabbits' eyes in the Draize test.



ANDREW KNIGHT reviews the Home Office figures for last year and the likely effects of the updated European Directive

Andrew Knight, BVMS, PhD, MRCVS, is a Fellow of the Oxford Centre for Animal Ethics. His recent PhD critically examined the merits of invasive animal use within biomedical research, toxicity testing, and veterinary education.