Refinement of welfare through development of a quantitative system for assessment of lifetime experience

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Abstract

This paper proposes a system that uses intrinsic study data to provide a clear visualisation of the stresses involved during the animal’s life history that can be applied to all types of studies, even those not requiring invasive techniques. Thus, it provides an opportunity for researchers to identify and refine key events which impact on the welfare of an animal, and to explain clearly the totality of any necessary harms when justifying the research. Assessment of animal welfare depends on measurement of a number of parameters which will vary according to species, the animal’s environment and the scientific procedure, all of which are inter-related. Currently, there are few tools to assess the effects of lifetime events on welfare or even, in some cases, to recognise that they have an impact on the level of suffering. A matrix to assess the combined effects of environment, experimental and contingent events on welfare has been applied, retrospectively, to programmes of work involving macaques (Macaca mulatta and M. fascicularis). Lifetime records, available for animals from their birth in the breeding colony through to experimental use in vaccine efficacy evaluation studies, were analysed as a robust validation test for the assessment matrix and refinement of the way in which information on these events is captured. A meaningful assessment method is required prospectively for project licence applications and retrospectively for licence review or decisions on re-use. The analysis will provide information that would support the application of refinements that would optimally enhance the lives of experimental animals.

Keywords: animal welfare, lifetime experience, macaque models of infectious disease, refinement of procedures, retrospective assessment, TB vaccine assessment

Introduction

The EU Directive 2010/63 on The Protection of Animals used for Scientific Procedures encompasses the concept of cumulative severity, in which the whole experience of each animal is taken into account when assessing the severity classification of a programme of work. This is a variation from previous classification systems where there was a requirement only to consider the direct suffering caused by a particular technique rather than taking into account any contingent events.

Specifically, the Directive requires “...taking into account the lifetime experience of individual animals...” (paragraph 25), “...to enhance the lifetime experience of the animals...” (paragraph 31), “...to reduce the duration and intensity of suffering to the minimum possible...” (Article 13.3b). It requires that the severity category shall take into account the nature of pain, suffering, distress and lasting harm, and its intensity, the duration, frequency and multiplicity of techniques, and the cumulative suffering within a procedure (Annex VIII). Annex VIII contains guidance on assignment criteria when considering cumulative suffering within a procedure but the examples are a mix of ‘techniques’ and ‘protocols’. They are not based on the use of specific refinement measures which can have a significant impact on the actual severity experienced by the animal.

The level of suffering experienced by an animal is the combination of direct effects on welfare (the procedural protocol on a licence in terms of the actual procedure and the combination of techniques and their subsequent outcomes) and any clinical condition from which the animal suffers which may not be due to the procedure (a bite wound or bullying by conspecifics, for example), plus any contingent effects related to housing, husbandry or transportation. The duration of each of these and the intervals between events must also be taken into account and the extent to which an animal is deviating from normality (Morton & Griffiths 1985).

There is an increasing interest in developing methods of assessing the lifetime experience of experimental animals by addressing issues such as the cumulative effect of a