Welfare risk assessment: the benefits and common pitfalls

LM Collins

School of Biological Sciences, Queen's University Belfast, Medical Biology Centre, 97 Lisburn Road, Belfast BT9 7BL, UK; email: l.collins@qub.ac.uk

Abstract

Risk is defined as a situation involving exposure to danger. Risk assessment by nature characterises the probability of a negative event occurring and quantifies the consequences of such an event. Risk assessment is increasingly being used in the field of animal welfare as a means of drawing comparisons between multiple welfare problems within and between species and identifying those that should be prioritised by policy-makers, either because they affect a large proportion of the population or because they have particularly severe consequences for those affected. The assessment of risk is typically based on three fundamental factors: intensity of consequences, duration affected by consequences and prevalence. However, it has been recognised that these factors alone do not give a complete picture of a hazard and its associated consequences. Rather, to get a complete picture, it is important to also consider information about the hazard itself: probability of exposure to the hazard and duration of exposure to the hazard. The method has been applied to a variety of farmed species (e.g. poultry, dairy cows, farmed fish), investigating housing, husbandry and slaughter procedures, as well as companion animals, where it has been used to compare inherited defects in pedigree dogs and horses. To what extent can we trust current risk assessment methods to get the priorities straight? How should we interpret the results produced by such assessments? Here, the potential difficulties and pitfalls of the welfare risk assessment method will be discussed: (i) the assumption that welfare hazards are independent; (ii) the problem of quantifying the model parameters; and (iii) assessing and incorporating variability and uncertainty into welfare risk assessments.

Keywords: animal welfare, expert opinion, policy, prevalence, risk assessment, welfare hazard

Introduction

Risk is defined by the Oxford English Dictionary (OED 2010) as:
Exposure to) the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility.

Risk assessment characterises the probability of a negative event occurring and quantifies the consequences of such an event. The use of risk assessment methods is becoming increasingly common in the field of animal welfare. Ultimately, they provide a way of comparing the impact of very different welfare problems both at the individual and population level, within and between species, based on a number of key factors (EFSA 2008, 2009, 2010a,b; Collins et al. 2010).

In risk assessment terminology, welfare problems are caused by a series of ‘hazards’. By example, a brachycephalic head shape in dogs may be considered a potential welfare hazard with possible consequences, such as brachycephalic airway obstruction syndrome and a reduced ability to exercise (Asher et al. 2009). Characterising a hazard, as the first step in the risk assessment process, is perhaps one of the most critical. The three most basic factors used to calculate risk are intensity of consequences, duration of effect of consequences (either as an absolute value if comparing within a breed or species, or as a proportion of lifetime if comparing between breeds or species, see Collins et al [2011], for an example) and prevalence (the proportion of affected individuals at any one time). These three factors allow a comparison of consequences and their impact on the animals experiencing them. However, in this basic form of risk assessment, specific details of the hazards are not considered.

To get a more complete picture of hazards and their consequences, and thus a more accurate risk estimate, it is important to consider information about the hazard itself in the calculation, for example by estimating the duration and probability of exposure to the hazard. In providing a quantitative, or even qualitative, value for each of these factors, the aim is to produce an objective estimate of risk for a series of potential welfare hazards.