Improving animal welfare standards while reducing disease exposure risk during euthanasia of trapped brushtail possums (Trichosurus vulpecula)

C Rouco*, †, KS Richardson ‡ and DM Tompkins †

† Landcare Research, Private Bag 1930, Dunedin 9054, New Zealand
‡ EpiLab, Hopkirk Research Institute, Massey University, Palmerston North, New Zealand
* Contact for correspondence and requests for reprints: roucoc@landcareresearch.co.nz; c.rouco@gmail.com

Abstract

In New Zealand there is a long history of research studies working with wild free-living brushtail possums (Trichosurus vulpecula) where euthanasia of large numbers of animals is frequently required. The most commonly used method for euthanising trapped possums is by blunt-force trauma. If possums being euthanised are potentially infected with bovine tuberculosis (TB), however, the blunt-force trauma method is associated with risks of researcher exposure to TB infection (eg risk of being scratched, bitten or blood-splattered). Here, we trial the use of a close-range shot to the head with a high-velocity air rifle as an alternative method for the euthanasia of cage-trapped possums. Our trial revealed that the air rifle method reduced the potential disease exposure risks to researchers by minimising blood-spatter area, and by completely avoiding the likelihood of both accidents due to animal handling and animal escapes. While both methods induced immediate unconsciousness leading to death, the air rifle method was quicker (ie shorter conscious handling and total time) and arguably had better animal welfare performance by significantly reducing the time to unconsciousness. Thus, we conclude that the air rifle method is suitably humane for possum euthanasia and should be considered when dealing with potentially TB-infected cage-trapped possums.

Keywords: air rifle, animal welfare, blunt-force trauma, shooting, tuberculosis, wildlife capture

Introduction

In New Zealand the introduced brushtail possum (Trichosurus vulpecula) is a major pest impacting on a range of conservation values and acting as the main wildlife reservoir of bovine tuberculosis (TB; Cooke et al 1995; Nugent et al 2015). There is, thus, a long history of research studies working with wild free-living possums (eg Cowan 2001; Tompkins et al 2009; Gormley et al 2012; Nugent et al 2015) where euthanasia of large numbers of animals is frequently required to, for example, assess diet (eg Glen et al 2012; Sweetapple et al 2013), enumerate parasites (Cowan et al 2002, 2006), or detect sub-clinical cases of TB (eg Whitford et al 2014: Nugent et al 2015). Animal welfare standards for trapping and/or killing animals should be a priority, and should minimise the pain and disruption for the species being handled (Iossa et al 2007). Regardless of the status of the species (eg as a recognised pest species such as the possum in New Zealand), they must be killed using the most humane method possible (Littin et al 2004). In New Zealand, the most commonly used method for euthanising possums trapped alive is by blunt-force-trauma (NPCA 2009). This consists of removing the animal from the trap by its tail, placing its head over a solid object (eg a rock or a hard tree root), and delivering a hard ‘stunning’ blow to the back of the head (usually using a hammer), followed by additional blows until the skull is crushed. The use of the blunt-force-trauma method is less aesthetically acceptable for many species than alternative euthanasia methods (eg inhaled anaesthetics like carbon monoxide or halothane, or injectable anaesthetics like pentobarbital combinations; AVMA 2013); however, when properly performed, it can be appropriate for some species (eg lambs: Finnie et al 2000; kangaroo joeys: McLeod & Sharp 2014). Through decades of experience and refinement in New Zealand, it is considered an effective and humane method for euthanising possums (NPCA 2009). If possums being euthanised are potentially infected with TB, however, the blunt-force-trauma method is associated with risks of researcher exposure to TB infection. For example, the necessity of removing individuals from cages prior to euthanasia puts the handler at risk of being scratched and bitten (eg Goldstein & Abrahamian 2015). In addition, a blow to the head can cause blood-splash which could be a potential source of TB contamination if it comes into contact with the skin (Twomey et al 2010).