A comparison of handling methods relevant to the religious slaughter of sheep

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Abstract

Legislation governing non-stun slaughter of sheep in England requires that they are individually and mechanically restrained for slaughter and not moved for at least 20 s post neck cut, until unconsciousness or insensibility occurs. Complying with the need for individual handling, in what is a flock animal, has the potential to adversely affect welfare, in turn contravening the general legislative requirement to reduce any avoidable distress at slaughter. This study investigated the effects of individually loading and restraining lambs compared with the normal practice of group loading and restraint of lambs prior to slaughter when using a V-shaped restrainer. Rotating and static design loading pens were also compared to represent the range of conditions and facilities found across English abattoirs. Plasma cortisol and lactate concentrations were significantly lower in group-loaded animals and significant reductions were observed in the time duration of a range of components of handling as well as the average total time to load each lamb. Loading pen type had a less marked impact upon results, however, individual loading and restraint of lambs within a V-shaped restrainer appears particularly stressful for sheep in comparison with group loading. The loading pen type had a mixed effect although the rotating crowding pen is likely to have minimised physical exertion in lambs during loading and restraint. Based on these findings, group loading in a V-shaped restrainer, whilst complying with the 20-s standstill, is likely to be preferable in religious, non-stun slaughter of sheep.

Keywords: animal welfare, lamb, non-stun religious slaughter, pre-slaughter handling, sheep, V-shaped restrainer

Introduction

It is widely accepted that the slaughter process is stressful for animals (Ferguson & Warner 2008). Events or situations which trigger a stress response are commonly referred to as ‘stressors’ and are generally categorised as being either physical or psychological in nature (Grandin 1997). Psychological stressors of particular importance within the abattoir include the novelty of the environment, handling, isolation and restraint and associated physical fatigue and injury. Within the slaughter process, sheep are often restrained for stunning and/or slaughter which in itself is stressful for the animal, however, when restraint is combined with isolation this can evoke a significant stress effect in sheep (Apple et al 1995). Isolation is thought to make sheep anxious and restless and hence they may display escape behaviours (Dwyer 2009).

As a prey species, sheep do not generally show overt, outward signs of fear and anxiety, making it difficult to monitor stress by behaviour. However, measuring physiological variables enables the quantification of a stress response, and blood cortisol is commonly used as a measure of stress at slaughter (Linares et al 2008; Probst et al 2013; Zimerman et al 2013). Blood lactate may also be used to assess acute stress and is advantageous due to its rapid response (Probst et al 2013); the release of cortisol and catecholamines result in glycolysis and so increased lactate production. Additionally, lactate is indicative of muscle activity and increases during exercise as a result of anaerobic muscle metabolism (Gericke & Belonje 1975). Creatine kinase (CK) also increases with exercise, as well as with injury to muscle (Gericke & Belonje 1975), and can be used to measure physical exertion and so indicate physiological stress pre-slaughter.

In 2012, approximately 13.8 million sheep were slaughtered in the UK (Defra 2013). In order to maintain slaughter line speeds whilst ensuring animal welfare is upheld, effective restraint mechanisms to facilitate stunning and/or slaughter have become increasingly important. Grandin (1995) advocates the importance of systems being designed to take advantage of the animal’s behavioural responses and furthermore developed a set of principles for minimising stress during restraint. In particular, sheep have strong flocking and following instincts and can quickly become distressed if separated from their peers (MLA 2013), so should always be handled in groups (Colditz & Dart 2009; Yates et al 2010). V-shaped conveyor restrainers, which deliver sheep in a continuous flow from the lairage to the point of stunning and/or neck cutting, are commonly installed in higher throughput English sheep plants. They are designed to utilise the flocking instinct of sheep and provide visual, audio...