

The effects of road transport on the welfare of cattle

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Introduction

The nature of modern cattle farming dictates that transport of animals from one place to another is necessary and commonplace. However, it is well documented that this transportation is perhaps the most stressful event encountered by these animals during the production process (Maria, et al., 2004). Knowles (1999), states that transporting cattle exposes them to a number of stressors, including loading and unloading, interaction with unfamiliar animals, the movement and noise of the vehicle, and lack of food and/or water. He maintains that these stressors are associated with physiological changes that lead to poor animal welfare. In the past year, several studies have been completed that allow a better understanding of the physiological changes occurring in cattle as a direct result of the distress of transportation. Behavioural changes associated with stress have also been investigated. These studies have attempted to improve animal welfare by discerning the specific causes of stress in transported cattle with the aim of improving standard practice.

Discussion

The physiological effects of distress in cattle exposed to long-term transport have recently been studied (Odore et al., 2004). Alterations to blood cortisol and catecholamine concentrations, and lymphocyte glucocorticoid receptor (GR) and β -adrenergic receptor (β -AR) concentrations were investigated in calves. The authors of this study were attempting to show a correlation between distress due to transportation and a compromised immune system in cattle. In this study, 24, six-month-old male calves were transported in trucks for 950 km (14 hours) from France to Italy. Blood samples were taken by venipuncture prior to transportation, on arrival at the destination, 24 hours after arrival and one week after the journey. The previously mentioned physiological parameters were measured at each stage.

Directly after transportation, the calves showed a significant increase in cortisol and catecholamine concentrations, which was consistent with previous studies (Knowles, 1999). Cortisol concentrations returned to normal after 24 hours. However, noradrenalin concentrations were still elevated when samples were taken a week after arrival at the destination. Lymphocyte GR and β -AR concentrations were significantly decreased immediately after transportation, but normal values for these parameters were restored within 24 hours of arrival. The authors of this study reported that the endocrine changes that occurred as a result of transportation reflected a reduction in immune system function and thus greater potential for the spread of disease. However, this study also highlighted that the distress of the cattle was of acute duration and that physiological parameters returned to normal levels within a short period. The results of this study were consistent with other studies undertaken in the past year.

Another recent study that investigated the effects of transport on cattle was performed by Grigor et al. (2004) in The Netherlands. This study aimed to examine changes in veal calves' behaviour, welfare and meat quality in response to transportation at the extremes of space allowances recommended by the European Council. For this experiment, 48 calves were divided into three groups. Two groups were transported for three hours, the first at the minimum space allowance (0.7 sq m) and the second at the maximum allowance (0.95 sq m), before being held in lairage for 1.5 hours and then slaughtered. The final group was slaughtered on-farm with no transport. Blood samples were taken before and after transportation, after lairage and after exsanguination. Heart rate, blood haemoglobin concentration, and red blood cell concentration were measured. Behaviour was also monitored.

All transported calves in this study were found to have an increased heart rate and increased plasma creatine kinase concentration during transportation and lairage, and increased plasma cortisol concentration immediately after transportation but not during lairage. Transported calves also displayed less normal behaviour, such as lying down and ruminating, during transport and lairage. Physiological parameter measurements showed that there were no measurable differences in welfare between animals at either of the extremes of space allowance. The major findings of this study were that transport and handling were stressful for the cattle and resulted in increased disturbance and fewer displays of normal behaviour, although meat and carcass quality were not adversely affected. This study, along with the following study by Maria et al. (2004) concluded that improving the welfare of the transported cattle was more an ethical concern than an economic one.

The final study (Maria et al. 2004) aimed to create an objective scoring system for measuring the stressors associated with loading and unloading cattle for transport. This research was undertaken so that the adequacy of handling facilities and staff could be more accurately measured. Forty journeys were followed, involving 268 animals. A scoring system was devised that examined the time taken to load or unload and the behaviour of the animals during these events. The reliability of behaviours as indicators of stress was used to weight the scoring appropriately. For example, vocalisations are strong indicators of stress in cattle (Maria et al. 2004) and thus were heavily weighted. The results of this study were validated using physiological indicators of stress, such as increased plasma cortisol, glucose, and creatine kinase concentrations. The results of this study were straightforward. Faster, trouble-free loadings resulted in lower levels of distress and thus lower scores on the devised scale. The authors of this paper concluded that the most effective method of improving the welfare of the cattle was through training and education of staff in behavioural monitoring and appropriate handling and also improving facilities.

Conclusion

These three studies each have animal welfare implications for cattle. They have enabled the physiological responses of cattle to the stresses associated with transport to be better understood. They have also identified specific areas of transport that are most stressful for the animals, such as loading and the movement of the vehicle itself. Particularly the study by Maria et al. (2004) outlined some specific methods for improving the welfare of cattle undergoing transportation, including training staff in appropriate handling skills. More research should be undertaken to identify methods of minimising stress in cattle undergoing transportation and thus further improving the welfare of these animals.

References

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