
**Abstract**

The effects of transporting Holstein Friesian bulls (n = 72; bodyweight 403 ± 3.5 kg) for 12 h by road were examined. Adrenal, haematological and immune responses, body temperature and performance were recorded. The animals had been previously housed for 96 days at three space allowances (1.2, 2.7 or 4.2 m² per bull). The bulls were allocated to one of two treatments: T (transport for 12 h; n = 16 per space allowance) and C (control; n = 8 per space allowance). Basal cortisol plasma concentrations and interferon (IFN)-c production from cultured lymphocytes did not show any statistically significant difference (P > 0.05) following the housing period. Removing bulls from their home pens and walking them to the pre-loading crush facility, loading onto the transporter, and unloading following the 12 h road journey, significantly (P < 0.001) increased plasma cortisol concentration. The bulls housed at 4.2 m² had greater (P < 0.05) plasma cortisol concentrations than bulls housed at 1.2 m² at loading, unloading, or on return to the crush holding facility; those housed at 1.2 m² had greater (P < 0.05) plasma cortisol concentrations than bulls housed at 2.7 and 4.2 m² in their home pens after transport. There was an increased (P < 0.05) plasma cortisol response in the T than in the C bulls following adrenocorticotrophic hormone administration. Transport significantly reduced (P < 0.05) IFN-c production, lymphocyte % and body weight and significantly increased (P < 0.05) neutrophils, eosinophils, packed cell volume, red blood cell numbers and haemoglobin. In conclusion, housing bulls for 96 days in a range of space allowances did not affect basal cortisol response or immune function parameters. Whereas transport increased plasma cortisol and reduced the immune response in the short-term, the changes were transient and within normal physiological ranges, suggesting that 12 h road transport had no adverse effect on welfare status over the longer term. Furthermore, transport of bulls housed at increased space allowance (4.2 m²/bull) resulted in a greater plasma cortisol response, albeit still within normal physiological range.

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