

SHORT COMMUNICATION

A COMPARISON OF WOODEN SLATS AND STRAW BEDDING ON THE BEHAVIOUR OF SHEEP

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Abstract

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The behaviour of two groups of sheep was observed when they were placed in a pen on wooden slats and/or on straw bedding for 48h. When sheep were placed in the pen and not given a choice of slats and straw, the proportion of scans spent standing and lying by one group of sheep were not affected by floor surface, whereas another group lay down more on the straw than on the slats during the first 24h in the pen. There was more movement when on straw than on slats. When given a choice of either slats or straw for 48h, the sheep spent more than half of the scans on straw. The study showed that sheep show a preference for lying down on straw compared with wooden slats. However, sheep will lie down on wooden slats. Although straw is, quite rightly, recommended as a suitable surface for lying, there was little evidence in this study that slats provide an unsuitable surface for a slaughterhouse lairage pen.

Keywords: *animal welfare, behaviour, floor, sheep*

Introduction

Sheep arriving at a slaughterhouse may have been transported for several hours and may not have been able to rest during the journey. The provision of a suitable surface on which the sheep can lie down and rest is an important welfare requirement. The Farm Animal Welfare Council (1984) suggested the provision of clean straw bedding for animals kept in slaughterhouse lairages. The Slaughter of Animals (Humane Conditions) (Scotland) Regulations 1990, require the provision of an adequate quantity of suitable bedding to be provided for animals kept overnight in a slaughterhouse lairage, unless the animals are kept on a slatted or mesh floor (The Scottish Office Agriculture and Fisheries Department 1992). This experiment investigated the lying behaviour of sheep on wooden slats and on straw bedding.

Materials and methods

Sixteen Suffolk rams (one-year-old), reared outside on pasture, were walked a short distance and placed in an outdoor enclosure. The rams were randomly allocated to one of two groups. Within an adjacent farm building a pen (6x2m) was constructed and included two hay racks (2m in length) and two automatic drinking bowls. On top of the concrete floor was placed either wooden slats (50mm wide with a 20mm gap) or a layer of straw (50–100mm deep).

The pen was illuminated by daylight and by two 100W tungsten filament lamps. The hay racks were filled with hay at 0900h and 1600h each day. The behaviour of the sheep while in the pen was recorded using a video camera and a time-lapse video recorder. The video recordings were analysed at 10-minute intervals, and the time taken to lie down and the proportion of scans during which the sheep were standing, moving and lying were calculated.

Experiment 1

One group of eight sheep (Group 1) was placed in the slatted pen at 1430h for 48h. The sheep were then returned to the outdoor enclosure and allowed to graze for 24h. The slats were removed from the pen and replaced by straw bedding. The same sheep were then put back into the now strawed pen for 48h. Then the second group of sheep (Group 2) were treated in a similar manner as Group 1 sheep, except that they were put on to straw bedding for the first 48h in the pen and on to wooden slats for the second 48h period. The 48h periods were divided into 2x24h periods for analysis, so the proportions of scans that each sheep spent standing, moving and lying during the first 24h period, the second 24h period and the total 48h period were calculated. A two-way, repeated measures analysis of variance was used to analyse the effects of floor type and group (Cohen & Holliday 1982). The effect of group and the order of the treatments were confounded. Where there was a significant floor x group interaction the means were compared using the least significant difference method. An analysis of variance was used to examine the effect of floor and group on the time taken for the sheep to lie down.

Experiment 2

One half (3x2m) of the pen was composed of wooden slats and the other half (3x2m) was composed of straw bedding. Group 1 was placed in the pen for 48h and the behaviour on the slats and straw bedding was recorded. The position of the slats and straw within the pen was reversed and then Group 2 sheep were placed in the pen for 48h and their behaviour was recorded. The proportions of scans that each sheep spent standing, moving and lying on slats and on straw during the first 24h period, the second 24h period and the total 48h period were calculated. An unpaired *t* test was used to compare Group 1 and Group 2. A *t* test was used to examine whether each group spent significantly more than half of the 48h period on straw.

Results

Experiment 1

The mean time taken by sheep in Group 1 to lie down on slats (7.4h SEM 1.30) was greater than that on straw (1.4h SEM 0.12), and greater than that taken by Group 2 on slats (1.33h SEM 0.16) and on straw (0.29h SEM 0.09). The proportion of scans spent standing and lying by Group 2 was not affected by floor surface. Whereas, Group 1 lay down more on the straw than on the slats during the first 24h in the pen, during the second 24h they spent more time lying on the slats than before and this was not significantly different to the time spent on straw (Table 1). There was more movement on the straw than on the slats.

Experiment 2

When given a choice of either slats or straw for 48h, there were no significant differences between groups in the proportion of scans spent standing, moving and lying on straw. However, Group 2 sheep spent more scans than Group 1 sheep lying on slats during the 48h

period ($P < 0.05$). The results for Group 1 and Group 2 sheep are shown in Table 2. Groups 1 and 2 spent more than half of the scans in the 48h period on straw ($P < 0.05$).

Table 1 Effect of type of floor on the mean proportion of scans spent standing, moving and lying.

Behaviour	Group 1		Group 2		SEM	Significance (F test ¹)	
	Slats n = 8	Straw n = 8	Slats n = 8	Straw n = 8		Floor	Group x Floor
<i>First 24h</i>							
Standing	0.56 ^a	0.31 ^b	0.38 ^b	0.35 ^b	0.098		**
Moving	0.06 ^a	0.03 ^b	0.04 ^{ab}	0.07 ^a	0.006		**
Lying	0.38 ^a	0.66 ^b	0.58 ^c	0.58 ^c	0.100		**
<i>Second 24h</i>							
Standing	0.38 ^a	0.42 ^a	0.33 ^a	0.32 ^a	0.091		
Moving	0.03 ^a	0.06 ^b	0.04 ^a	0.05 ^b	0.012	**	
Lying	0.59 ^a	0.52 ^a	0.63 ^a	0.63 ^a	0.134		
<i>Total 48h</i>							
Standing	0.47 ^a	0.36 ^b	0.35 ^b	0.34 ^b	0.104		*
Moving	0.04 ^a	0.05 ^b	0.04 ^a	0.06 ^b	0.010	*	
Lying	0.48 ^a	0.59 ^b	0.61 ^b	0.60 ^b	0.128		**

¹ Using 14 *df*

^{a b c} Row means with different superscripts differ significantly ($P < 0.05$)

n – number of sheep

Table 2 Proportion of scans spent on slats and straw when given a choice of floor (mean \pm SEM).

Behaviour	Group 1		Group 2	
	Slats	Straw	Slats	Straw
<i>First 24h</i>				
Standing	0.12 \pm 0.023	0.24 \pm 0.030	0.15 \pm 0.035	0.16 \pm 0.035
Moving	0.01 \pm 0.003	0.03 \pm 0.008	0.01 \pm 0.002	0.01 \pm 0.003
Lying	0.02 \pm 0.012	0.57 \pm 0.046	0.20 \pm 0.061	0.47 \pm 0.08
Total	0.16 \pm 0.031	0.84 \pm 0.031	0.35 \pm 0.092	0.65 \pm 0.09
<i>Second 24h</i>				
Standing	0.11 \pm 0.024	0.19 \pm 0.020	0.14 \pm 0.003	0.16 \pm 0.015
Moving	0.01 \pm 0.002	0.03 \pm 0.005	0.01 \pm 0.003	0.03 \pm 0.004
Lying	0.01 \pm 0.010	0.64 \pm 0.039	0.14 \pm 0.054	0.51 \pm 0.067
Total	0.14 \pm 0.032	0.86 \pm 0.032	0.29 \pm 0.08	0.71 \pm 0.080

Discussion

This study showed that floor surface (slats vs straw) did affect the times spent lying by one group of sheep, but another similar group was not seemingly affected by floor type. However, when given the choice of floor surface there was a clear preference for straw bedding compared with wooden slats. Whether the differences between Groups 1 and 2 in Experiment 1 were due to individual differences or due to the order of the treatments was not known. The mean lying behaviour within groups for each treatment did not appear to have been affected by one or more sheep with extreme results. It was possible that the slats affected the lying behaviour of Group 1 more than of Group 2, because they were on slats the first time they were put into the pen, whereas Group 2 had been in the pen prior to the slats treatment. After 24 hours Group 1 appeared to have habituated to the slats, illustrated by an increase in the amount of time spent lying on the slats in the second 24h period.

The experiment did not simulate some important aspects of the slaughterhouse environment. The sheep had not been transported prior to the behavioural observations, and the sheep were not subjected to disturbances and a novel environment. If sheep have not been able to rest during transport, the provision of a floor surface which does not interfere with lying behaviour may be an important welfare requirement. The relative merits of straw and wooden slats as floor surfaces in slaughterhouse lairages, include factors other than comfort or suitability for lying. Both straw and wooden slats can harbour infectious material, but if the straw is totally removed after use there is little risk of the spread of infection. However, the use of straw necessitates a regular supply and suitable facilities for storage and disposal. In addition, the labour requirement for bedding and cleaning between batches of animals is greater for straw than for slats. If a solid floor is used below the slats, periodic cleaning is necessary and demanding of labour. Wooden slats are thought to assist with drying wet fleece and to keep the sheep clean. However, they require regular maintenance to ensure that there are no gaps and broken surfaces which could injure the animals.

Animal welfare implications

This study showed that sheep show a preference for lying down on straw compared with wooden slats. However, this study also showed that sheep will lie down on wooden slats. Although straw is, quite rightly, recommended as a suitable surface for lying, there was little evidence in this study that slats provide an unsuitable surface for slaughterhouse lairages.

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References

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