

## Effect of underfoot-surface on expression of oestrus in beef cows.

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### Introduction

There is increasing interest in autumn calving of beef cow herds. This requires breeding during the winter when animals are housed. While housing facilitates the use of AI it reduces the expression of oestrus and, consequently detection is more difficult. It was recently shown (French & Hickey, 2004) that cattle overwintered on woodchip-based outdoor pads (OWP) had superior liveweight and carcass gain compared with animals housed on conventional slatted floors. To-date there is no information on the suitability of OWP for beef cows and their calves. New radiotelemetric heat detection systems make possible the comprehensive evaluation of oestrous behaviour in beef cows indoors on slatted floors and outdoors on OWPs. The objective of this study was to monitor oestrous activity in beef cows on OWP-wintering pads and compare this to cows on conventional slatted floors.

### Materials and methods

In year 1, 32 dry cows and 26 lactating Charolais x Limousin beef cows were used. Within lactational status, cows were assigned randomly to one of two experimental treatments as follows a) indoor pen with conventional concrete slatted flooring at 3.75m<sup>2</sup>/cow and calf (Slats) b) OWP's with underfoot surface of wood chipping, at spacing of 13.5m<sup>2</sup>/cow and calf. All cows were placed on their respective treatments one-week before the study began. All cows were fed the silage ad-libitum silage plus 2 kg of concentrates cow<sup>-1</sup>. Calves had access to a creep area with concentrates. In year 2, 28 lactating Charolais x Limousin cows were randomly allotted to either (i) slats (ii) OWP as described above. At about 40 days after calving a vasectomised teaser bull was placed with one pen of cows on each treatment. Detection of heat was carried out using the HeatWatch radiotelemetric system which involved attaching pressure sensitive transmitters to the tail head region of each cow. Milk or blood samples taken three times week<sup>-1</sup>, were assayed for progesterone and the resultant profiles used to estimate the occurrence of ovulation and the incidence of silent heat. Data were analysed by PROC GLM with the model including terms for treatment and lactational status, presence or absence of teaser bull where appropriate.

### Results and Discussion

In year 1 under-foot surface had a significant effect on the recorded duration of standing heat, number of mounts received, and on the incidence of false heats (Table 1). The duration of standing was shorter in lactating cows than in dry cows (5.3 ±4.67 h vs 8.4 ±6.34 h; P<0.01) while the number of mounts received (lactating: 11.8 range (3-51) vs dry 13.0 (range 3-139); P>0.05) was similar. In year 2 the presence of a bull

increased the number of mounts received by cows on both surfaces as well as increasing the recorded duration of heat (Table 2).

**Table 1.** Mean duration of standing heat (±SD), number of mounts received (range) and incidence of false heats

	Slats	OWP	Sig.
Duration of heat (h)*	5.6 ±6.04	7.8 ±5.81	P<0.05
No Mounts*	7.6 (3-29)	18.2 (3-139)	P<0.05
% Silent Heats	57%	22%	P<0.05

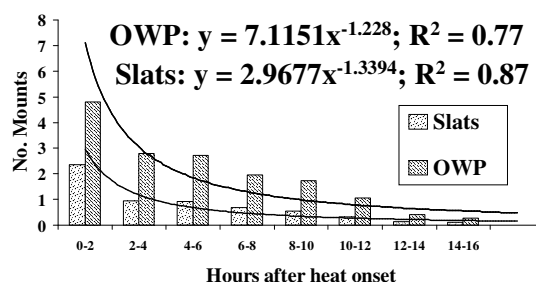
\*Excludes silent heats

**Table 2.** Effect of teaser bull on duration of heat (h) and number of mounts (back transformed) received.

Surface	+/- Bull	Mean ± S.D duration of standing heat*	Mean No. Mounts* (Range)
Slats	- Bull	3.7±3.90	5.8 (3-13)
	+ Bull	10.0±3.80	16.1 (6-33)
OWP	- Bull	6.9±2.71	11.8 (5-19)
	+ Bull	10.1±4.22	22.0 (4-28)
Sig		P<0.05	P<0.05

\* Does not include cows with "silent heats".

The number of mounts for each 2-hour period from heat onset for cows on slats and OWPs is presented in Fig. 1



**Fig 1.** The number of mounts for each 2-hour period from heat onset for cows on slats and OWPs

The average number of mounts received for the first 12 hours of standing heat is greater for cows on the OWPs than for cows on slats. For both surfaces there was a (significant decline in mounting activity with interval from heat onset P<0.05).

### Conclusion

Beef cows on OWPs exhibit more mounting activity, have a longer recorded standing heat, and fewer silent heats than cows on concrete slats. The presence of a teaser bull ameliorates the negative effect of the concrete slat floor on heat-related activity. Mounting activity is greatest during early heat and declines with time.

### References

French P. & Hickey M.C. (2004) Proc Agricultural Research Forum. Page 15.