

The effect of floor type on the performance of growing dairy origin bulls

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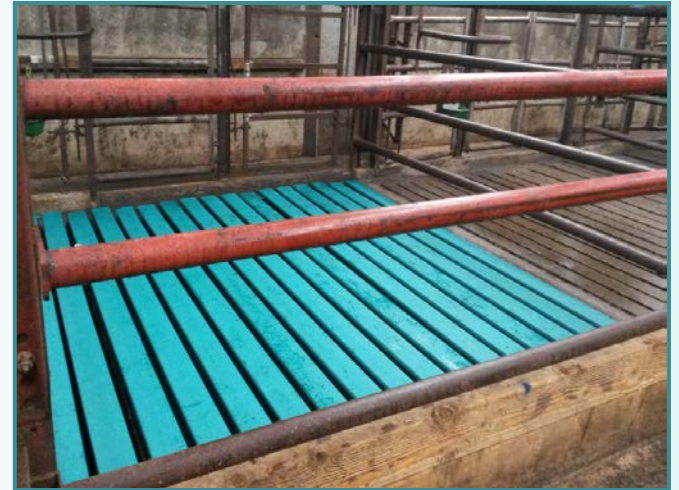
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Introduction

- Cattle are often housed during the winter period due to poor weather conditions
- Fully slatted flooring is commonly used to accommodate beef cattle
- A key reason why producers use fully slatted flooring is that it eliminates the need for a bedding substrate



Introduction

- Previous research has demonstrated welfare benefits associated with fully slatted flooring covered with rubber (Cozzi *et al*, 2013)
- Conflicting evidence that fully slatted flooring covered with rubber improves animal performance (Lowe *et al*, 2001)
- Limited scientific research on the effect of floor type in growing beef cattle



Objective

Evaluate two floor types for accommodating growing beef cattle



Treatment 1
Concrete slats



Treatment 2
Rubber strips



Materials and Methods

- Forty dairy origin bulls with a mean initial live weight of 224 kg (SD=29.6 kg)
- Housed in October 2015
- Stocking density 2.2m² (FQAS, 2014)
- Growing period 101 days



Materials and Methods



- *Ad libitum* grass silage daily
- Initially supplemented with 2.0 kg concentrates/head/day
- Increased by 0.5 kg/week until intake reached 8.5 kg/head/day on day 101
- Intakes measured on a per pen basis



Silage Quality

	Silage quality	Northern Ireland Average
Dry matter (%)	39.4	28.8
pH	4.2	4.0
Ammonia (% total N)	12.1	9.9
Protein (% DM)	12.7	10.9
ME (MJ/kg DM)	10.6	10.8
D-value (% DM)	66.2	67.7



Concentrate Composition

Chemical composition	g/kg DM
Dry matter	860
Protein	150
Oil	45
Fibre	125
Ash	75



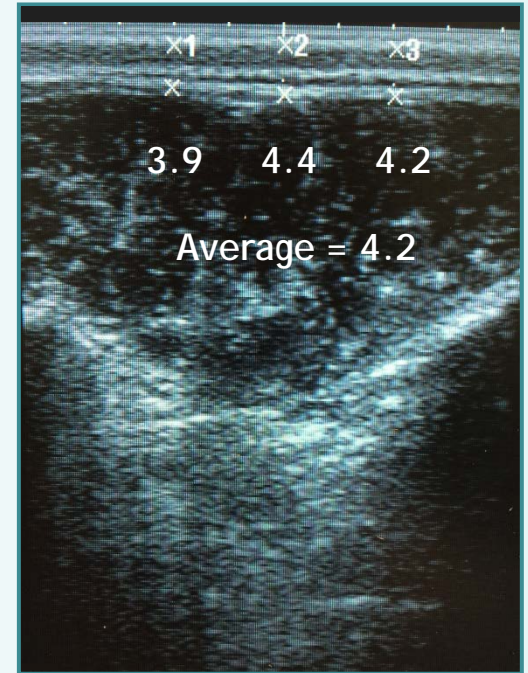
Measurements

Live weight

- Live weights were measured on two consecutive days at the start and end of the study, and monitored fortnightly

Back fat depth

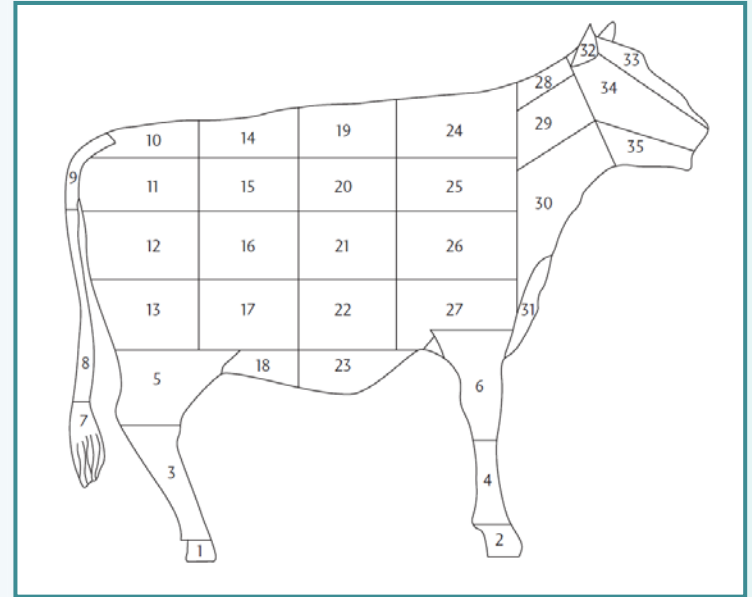
- Ultrasonically scanned for back fat depth monthly using a SonoScape AV6 Veterinary Ultrasound Scanner with a Convex Probe 5-9MHz



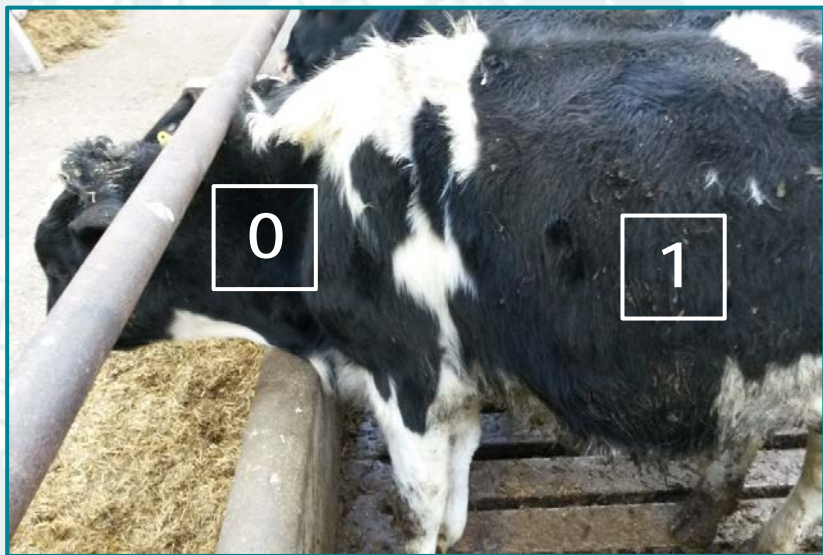
Measurements

Cleanliness Scoring

- Cleanliness scored on day 5, 50 and 101
- Scott and Kelly (1989)
- Each animal divided into 70 sections
- Scored from 0 (very clean) to 3 (very dirty)



Cleanliness scores 0-3



- Scores were then summed for each animal giving an overall cleanliness score

Measurements

Behaviour

- Pedometers (IceQubes) were attached to four animals from each treatment

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Concrete slats															
Rubber strips															

- Measuring the number of steps, total lying duration, number of lying bouts and duration of lying and standing bouts



Statistical Analysis

- GenStat Release 18 (2015)
- Data were analysed with linear mixed model methodology using REML estimation with pen as a random effect and treatment as a fixed effect
- Pedometer data were analysed as a one-way ANOVA





Results



Feed Intake

Feed intake	Concrete slats	Rubber strips	sem	Significance
Silage DMI (kg/day)	3.43	3.56	0.231	ns
Concentrate DMI (kg/day)	4.17	4.17		
Total DMI (kg/day)	7.60	7.73	0.231	ns

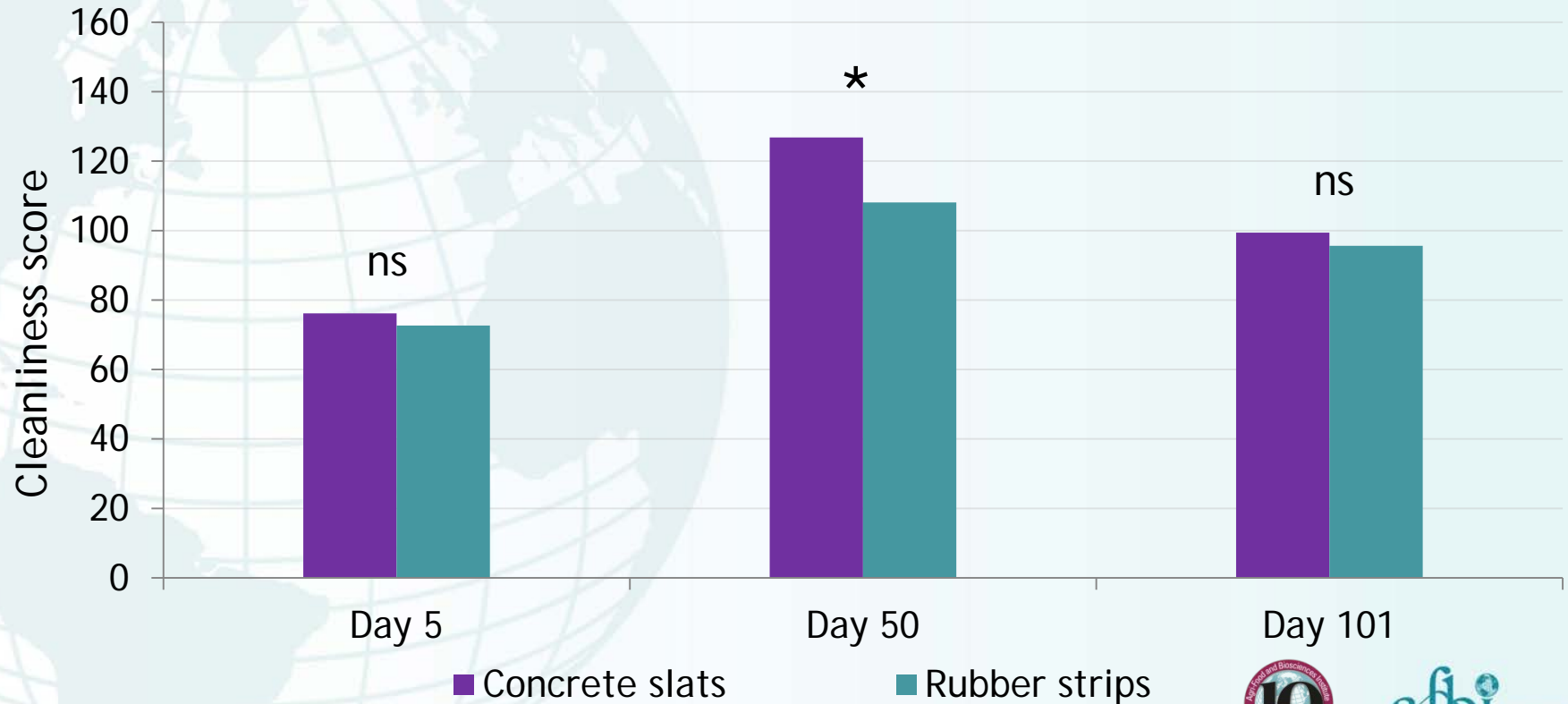


Animal Performance

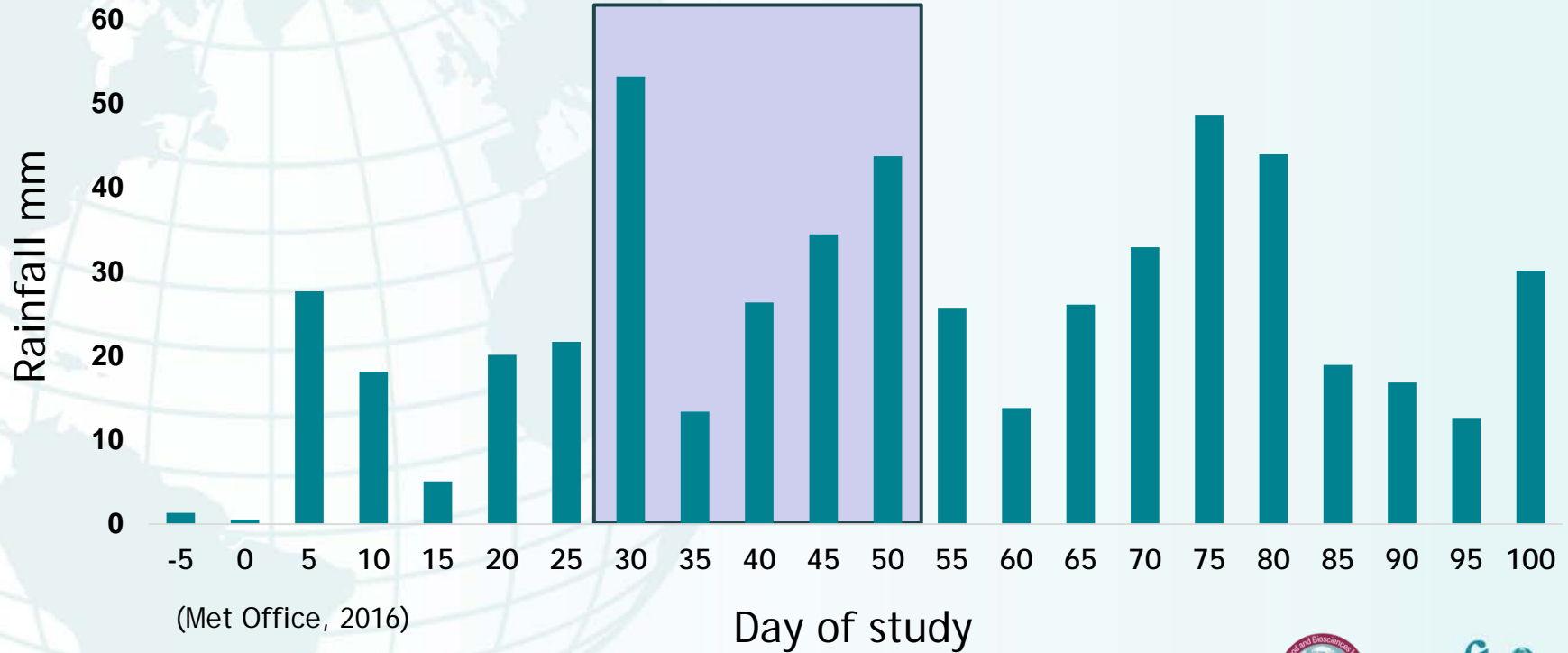
Animal Performance	Concrete slats	Rubber strips	sem	Significance
Live-weight gain (kg/day)	1.37	1.38	0.030	ns
Back fat gain (mm)	1.92	1.84	0.071	ns
Feed conversion ratio (kg/kg live weight)	5.31	5.33	0.196	ns



Animal Cleanliness



Rainfall



Behaviour

Behaviours	Concrete slats	Rubber strips	sem	Significance
Number of steps (steps/day)	909	1130	102.1	ns
Total lying time (min/day)	941	944	26	ns
Number of lying bouts (bouts/day)	14.08	18.76	1.41	0.057
Mean duration of standing bouts (min/bout)	35.94	27.41	3.09	0.099
Mean duration of lying bouts (min/bout)	68.90	51.50	6.02	0.087



Behaviour

Behaviours	Concrete slats	Rubber strips	sem	Significance
Number of steps (steps/day)	909	1130	102.1	ns
Total lying time (min/day)	941.2	943.9	25.62	ns
Number of lying bouts (bouts/day)	14.08	18.76	1.41	0.057
Mean duration of standing bouts (min/bout)	35.94	27.41	3.09	0.099
Mean duration of lying bouts (min/bout)	68.90	51.50	6.02	0.087



Conclusion

- Floor type had no effect on the performance of growing beef cattle
- There was no effect of floor type on animal cleanliness at the end of the growing period
- There was a tendency for animals accommodated on rubber strips to have different behaviours compared to those on concrete slats



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