Session 9 Poster 9

INFLUENCE OF RUBBER FLOORING ON CLAW GROWTH AND HEALTH OF LACTATING DAIRY COWS IN SOUTHEASTERN SICILY USING INFRARED THERMAL IMAGING

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INTRODUCTION

Lameness results in major economic losses on dairy farms (Green et al., 2002), for this reason the quality of floors, in terms of shape, hardness and hygiene is of great importance for the health of cows feet and legs. Soles of hooves affected by subclinical laminitis commonly appear soft and warm long before the appearance of yellowish discoloration, lesions, and ulcers (Nocek, 1997). Infrared thermal imaging (IRT) has been introduced as a non-invasive diagnostic tool to detect inflammatory conditions.

OBJECTIVES

- To evaluate the effect of floor material (concrete vs rubber) on claw growth and health
- To assess the ability of IRT to early detect foot lesions based on surface temperature, allowing interventions that could prevent or attenuate subsequent lameness.

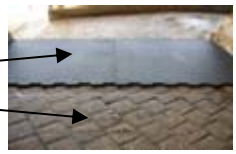
MATERIALS & METHODS

Animals

- Thirty lactating dairy cows raised in Sicilian
- DIM: 137 ± 60
- Milk yield/cow/d: 38.26 ± 6.8kg/d

Grouping treatment floor

- Rubber flooring (15 cows)
- Concrete flooring (15 cows)

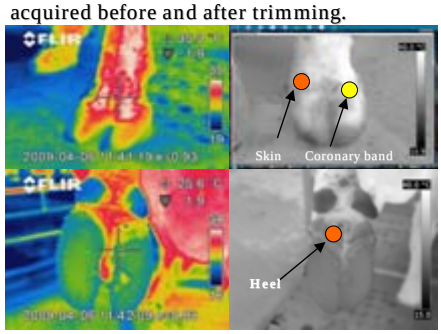


Measurements

- Hoof trimming and claw length measurement were performed at each control day (March, July & November 2009)

Thermal imaging

- Thermal image of the dorsal front hoof and palmar surface of each claw for all cows were acquired before and after trimming.



Maximum temperature of selected areas:

- Coronary band (Nikkhah et al., 2005)
- Heel
- Delta (coronary band – skin)

Foot lesions:

- Laminitis lesions (L)
- Digital dermatitis (D)
- Deformity of claw (C)
- Sole ulcers (U)
- Interdigital dermatitis (I)
- Heel erosion (E)
- Sole hemorrhage (H)
- White line separation (S)

Healthy foot (N)

RESULTS

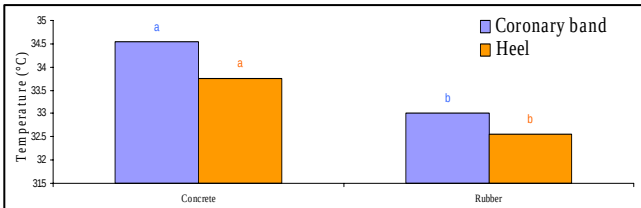


Figure 1. Effect of floor material on coronary band and heel maximum temperature

Table 1. Average growth of claws within floor material

	April- July	July - November
Rubber (cm)	0.65 (± 0.43)	0.12 (± 0.45)
Concrete (cm)	0.29 (± 0.39)	-0.04 (± 0.30)

Table 2. Incidence of foot lesions within floor material

Incidence (%)	L	D	C	U	I	E	H	S
Rubber	0.3	6.5	15.1	0.3	5.4	16.1	28.0	28.5
Concrete	1.2	9.8	13.3	0.0	3.7	13.3	34.2	24.4

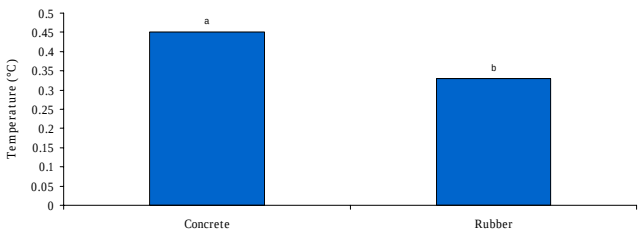


Figure 3. Delta Temperature of Coronary band - skin within floor material

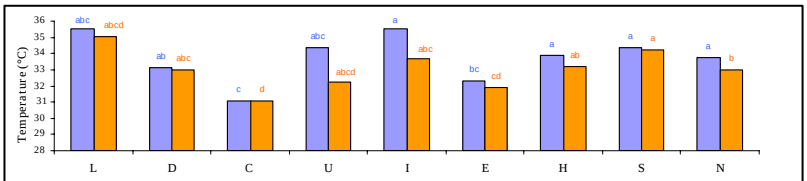


Figure 2. Average maximum temperature of coronary band ( ) and heel ( )within lesion type

CONCLUSIONS

- Floor material significantly influenced claw growth, coronary band and heel temperature, detected using IRT, as well as delta temperature indicating a higher compression effect of feet in concrete flooring
- A low incidence of foot lesions was observed, mostly due to a high-level herd management
- IRT images showed that coronary band and heel temperature were significantly higher in presence of foot lesions (mainly for L, I, H and S)
- Thermal imaging could be recommended as a non-invasive detection tool for dairy cows lameness

CITED LITERATURE

- Green L.E., V.J. Hedges, Y.H Schukken, R.W. Blowey and A.J. Packington. 2002. The impact of clinical lameness on the milk yield of dairy cows. J. Dairy Sci. 85, 2250-2256
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