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Effect of rubber mat flooring on claw health and leg lesions in *Murrah* Buffaloes

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Abstract

The present investigation was conducted to evaluate the effect of rubber mat flooring on claw health and leg lesions in lactating Murrah buffaloes. Twelve buffaloes (2nd–3rd parity) were randomly divided into two homogeneous groups: control (concrete floor) and treatment (rubber mat flooring of 30 mm thickness). The study was carried out for a period of 60 days. Claw lesions and leg injuries were assessed at regular intervals using standard scoring methods. The total claw lesion score was significantly ($P<0.05$) lower in the rubber mat group (29.13) compared to the concrete floor group (36.87), mainly due to a reduction in sole lesions. Similarly, total leg lesion score was significantly ($P<0.05$) reduced in the treatment group (46.59) compared to control (62.41), with a marked decrease in knee lesions. The results indicate that rubber mat flooring effectively reduces mechanical stress on hooves and joints and improves the physical welfare of dairy buffaloes.

Keywords: Buffalo, claw lesion, leg injury, rubber mat, welfare

Introduction

Housing conditions, particularly flooring type, significantly influence the health and welfare of dairy animals. In tropical production systems, concrete flooring is widely used due to its durability and ease of maintenance. However, its hard and abrasive nature predisposes animals to hoof and limb disorders. Prolonged standing on such rigid surfaces increases mechanical stress on claws, resulting in bruising, sole lesions and lameness^[1].

Buffaloes are naturally adapted to softer ground conditions and may experience greater discomfort when housed on hard floors. Providing a softer and resilient flooring surface has been shown to improve locomotion, reduce injury and enhance comfort^[2]. Therefore, the present study was undertaken to assess the effect of rubber mat flooring on claw health and leg lesions in Murrah buffaloes.

Materials and Methods

The experiment was conducted at the Cattle and Buffalo Farm, Livestock Production and Management Section of ICAR-Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh.

Twelve lactating Murrah buffaloes (2nd–3rd parity) were selected and randomly allocated into two groups (n=6 each).

- **Control group (C):** maintained on conventional concrete flooring
- **Treatment group (T):** housed on interlocking rubber mats (5 ft × 8 ft; 30 mm thickness)

The experiment lasted for 60 days. Animals were maintained under uniform feeding and management with ad libitum access to water. Housing areas were cleaned twice daily.

Claw lesions were evaluated fortnightly using a 4-point scoring system^[3], while leg lesions (hock and knee) were assessed weekly using a 0–3 scoring scale^[4].

Since the lesion scores were ordinal in nature, data were analysed using the Kruskal–Wallis test. Mean rank differences between groups were compared and significance was declared at $P<0.05$. Statistical analysis was performed using JMP 8.0 software.

The experiment was conducted at ICAR-Indian Veterinary Research Institute, Izatnagar,

following the standard institutional guidelines and in accordance with the regulations of the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Government of India.

Results and Discussion

Claw lesion score

Flooring type significantly influenced claw health (Table 1). Our findings are consistent with those of Upadhyay [5]. Greater claw lesion scores were reported on concrete floor. This might be attributed to persistent strain on various zones of the hoof as a result of the hardness of the floor. Our finding are consistent with those of previous report that the lateral wall zone (20.7%) received more vertical ground reaction force from rubber flooring systems, whereas the lateral sole received less (12.7%) as a result, the animal's hoof health would be improved [6]. The total claw lesion score was significantly ($P<0.05$) lower in buffaloes maintained on rubber mats compared to those on concrete flooring. A significant reduction was observed in sole lesions, whereas other parameters showed non-significant differences.

Table 2: Leg lesion scores (mean rank) of buffaloes on different flooring systems

Parameter	Control (Concrete)	Treatment (Rubber mat)
Hock lesion score	59.13	49.87
Knee lesion score	61.41 ^a	47.59 ^b
Total leg lesion score	62.41 ^a	46.59 ^b

Means bearing different superscripts differ significantly ($P<0.05$)

Hock and knee lesions can occur as result of poor stall conditions, particularly the floor [7]. In our study we found that there were lesser leg lesions on T group than C group. This might be due to the fact that rubber mats provided cushion to the carpal and tarsal joint during sitting /standing of the animal and protected them from any injury. We also observed that the knee lesions for concrete floor and rubber floor was significantly different and it might be due to the sitting and standing posture of the animal. Rubber mats improve footing and reduce slipping during lying and rising movements. This reduces impact stress on joints and minimizes traumatic injuries. Similar findings have been reported by Eicher *et al.* [8] and Flower *et al.* [9].

Conclusion

Rubber mat flooring (30 mm thickness) significantly improves claw health and reduces leg lesions in Murrah buffaloes. It can be recommended as a practical and effective housing modification to enhance animal welfare under loose housing systems. Further studies involving larger number of animals with additional treatment and control groups over an extended duration are warranted to validate these findings and evaluate the long-term economic feasibility of rubber mat flooring in commercial dairy buffalo production.

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Conflict of Interest

The authors declare no conflict of interest.

Table 1: Claw lesion scores (mean rank) of buffaloes on different flooring systems

Parameter	Control (Concrete)	Treatment (Rubber mat)
White line score	31.00	29.00
Sole lesions	33.05 ^a	28.65 ^b
Interdigital dermatitis	30.50	29.50
Total claw score	36.87 ^a	29.13 ^b

Means bearing different superscripts differ significantly ($P<0.05$)

The higher incidence of sole lesions in the control group may be due to increased pressure and friction on hard flooring. Rubber mats provide cushioning, reducing impact forces and improving weight distribution across the claws. Similar observations were reported by Telezhenko [6].

Leg lesion score

Total leg lesion score was significantly ($P<0.05$) lower in the treatment group (Table 2), mainly due to reduced knee lesions.

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