

EFFECT OF MOULD CONTAMINATION OF THE AIR ON THE PERFORMANCE OF MADRAS RED LAMBS UNDER INTENSIVE SYSTEM OF MANAGEMENT

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ABSTRACT

An experiment was conducted to assess the level of mould contamination in the air of sheep pen and its influence on growth performance of lambs on slatted floor and mud floor. Weekly measurements were taken at 8 am and 2 pm for the estimation of mould count in air and climatic variables viz. air temperature, relative humidity and air velocity. The body weights of lambs were recorded fortnightly. Total mould count was significantly ($P < 0.01$) higher in mud floor pen (22.94 ± 1.40 cfu per 30 l of air) than in slatted floor (15.08 ± 1.12 cfu per 30 l of air), whereas the type of floor had no effect on climatic variables. The body weight (24.23 ± 1.27 kg) of lambs were significantly ($P < 0.01$) higher in slatted floor.

KEY WORDS: Mould - air borne microbes - sheep house - microclimate - floor type

INTRODUCTION

Infectious aerosols cause allergic and toxic effects (Hartung, 1994 and Wathes, 1994), which are undoubtedly important factor affecting the health of housed animals and stockmen. The mould pollutant in air results in ill health interferes with the general performance of the animal (Owen, 1994). As stressed animals perform sub optimally, (Curtis, 1972) animal performance culminates in a poor economy of production. Hence, monitoring of the indoor environment is an absolute necessity to reduce the mould pollution level in air and to increase the health and performance of animals and health of workers. The present study was therefore undertaken to find out the level of mould contamination & its influence on growth performance of lambs.

MATERIALS AND METHODS

The study was carried out in sheep pens at Livestock Research Station, Kattupakkam for a period of five months from May, 2000 to September, 2000. Twelve apparently healthy weaned Madras red male lambs were selected and divided into two groups of six each at 3 months of age with mean body weight of 12.63 ± 1.39 kg. The two groups were assigned at random to the two experimental housing systems with mud and slatted floor and were maintained under feedlot system of management. Air samples and climatic values were taken from the slatted and mud floor of sheep pens every week once at 8.00 am and 2.00 pm. and body weight of lambs was also recorded at fortnightly intervals.

Collection of air sample for mould pollution

Sixty-five grams of Sabouraud dextrose agar was suspended in 1 litre of distilled water and the final pH was adjusted to 5.6 ± 0.2 . The suspension was boiled to dissolve completely and autoclaved at 15 lb pressure per square inch for 15 minutes to sterilize the media. Fifteen to twenty millilitre of molten and cooled (45°C) agar was poured to each petridishes and allowed for solidification.

An airborne bacterial sampler was used to collect air sample for mould count. The sampler was operated at the prescribed flow rate of 30 l/min over the concerned medium. All samples were taken from the centre of the pen at 0.75 m height above the floor level. Petridishes filled with 20 ml of Sabouraud agar was used for estimating mould count. After the collection of samples, the petridishes were incubated at 37°C for 24 hours. At the end of 24 hours the number of colonies were counted by using Quebec colony counter. The numbers of colonies were expressed as cfu/30 l of air.

Temperature ($^{\circ}\text{C}$), relative humidity (per cent) and air velocity (m/sec) were measured with a battery operated Testo-452 precision instrument.

Lambs were weighed before feeding at fortnightly interval using a standard weighing balance with accuracy of 200 g to determine the body weight in kilograms.

The data were analysed statistically as per the methods outlined by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The mould count (cfu/30 l of air) in the air samples of sheep pen with different flooring pattern at different periods are presented in table 1 and overall mean in table 2.

Significantly higher (22.94 ± 1.40 cfu per 30 l of air) mould count ($P < 0.01$) in mud floor (Table 2) was seen than in slatted floor (15.08 ± 1.12 cfu per 30 l of air). However, the mould count did not vary between the periods studied. The reason might be due to spillage of water on wasted fodder material, which may act as a substrate for the growth of fungi.

Monthly variations in the mould count were observed by Hartmann et al. (1987) and Debey et al. (1995). But in the present study, monthly variation did not have any influence on the mould count. The reason for the non-seasonal effect on mould count might be due to diurnal fluctuation in the aerial mould count within the sheep pen and amount of fungi per 30 l of air varied widely from sample to sample in both the pens (Blom et al. (1995). The climatic variables such as air temperature, relative humidity and air velocity differed significantly ($P < 0.01$) between the periods but not between the floors.

The results showed that the lambs reared on slatted floor had significantly ($P < 0.01$) higher body weight (24.23 ± 1.27 Kg) as compared to mud floor (20.70 ± 1.54 Kg) due to lower amount of mould count (Table 3).

Table 2: Mean mould count and climatic variables in sheep pen with different flooring pattern at different periods of time (M)

Period	Floor		Floor
	Slatted floor (cfu/30 l)	Mud floor (cfu/30 l)	
Mould count (cfu/30 l of air)			Bet fl Mud
Morning 8.00 am	16.33 ± 1.41	15.08 ± 1.12	22.94 ± 1.40
Afternoon	13.83 ± 1.41	31.78 ± 0.41	28.31 ± 1.80
Relative humidity (Per cent)	55.09 ± 1.73		55.14
Air velocity (m/sec)	1.00 ± 0.01		1.07

** $P < 0.01$

Table 3: Mean \pm S.E of body weight (Kg) of sheep in slatted and mud floor at fortnight intervals from May 2000 to September 2000.

Period	Floor	
	Slatted floor (Kg)	Mud floor (Kg)
May 1	12.63 \pm 1.39	12.68 \pm 0.88
May 15	14.03 \pm 1.50	13.97 \pm 0.83
June 1	15.82 \pm 1.40	14.37 \pm 0.82
June 15	15.93 \pm 1.26	14.77 \pm 0.09
August 1	17.17 \pm 1.34	15.53 \pm 0.96
August 15	18.47 \pm 1.39	16.23 \pm 1.10
September 1	20.32 \pm 1.48	17.78 \pm 1.23
September 15	22.07 \pm 1.51	19.27 \pm 1.39
October 1	23.18 \pm 1.39	19.92 \pm 1.45
October 15	24.23 \pm 1.27	20.70 \pm 1.54

The results suggested that the slatted floor is ideal for rearing lambs. This is in agreement with Sainsbury and Sainsbury (1988). Slatted floor systems provided a non polluted microclimate in sheep houses.

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