

EFFECT OF LIGHTING PERIOD AND POPULATION DENSITY OF BROILES ON THE APPEARANCE OF LESIONS ON THE FOOT PADS

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Introduction

For determination the degree of animal welfare, among other parameters, estimation of condition and appearance of lesions on the plantar pads, ankles and chest were used. These three parameters are an indicator of housing conditions and general well-being of livestock production systems in Europe and the United States.

The incidence of damage foot pad is correlated with the quality of footcloth. Broilers standing on a wet footcloth has a much more frequent occurrence of damage foot pads. There is a large number of factors affecting the humidity of footcloth, some of them are population density and lighting program. These factors, alone or in combination influence the humidity footcloth, and thus the occurrence of damage foot pads. Various lighting programs have the potential to change broilers behavior and physical activity. Fattening chickens in lighting applications with reduced lengths periods of light and shorter periods of darkness, significantly increasing physical activity chickens during periods of light, dry footcloth gets better and significantly reduces the risk of dermatitis on the foot pads.

Results

Effects of lighting program and the population density 21 and 28 day of the occurrence of damage foot pads are shown in Table 1. The effect of light on the appearance of lesions 21 and 28 days has not been confirmed, as well as population density, day 21 ($P > 0.05$), while the difference between the higher and lower population density is statistically significant ($P < 0.05$) at chicken with grade 1 and 3. Overall damage foot pads is statistically higher ($P < 0.05$) in broiler chickens at higher population density compared to the lower population density.

Table 1: The average score and the incidence (%) lesions on the foot pads 21 and 28 days old chicks

Treatment	The level of factor	Frequency	21 day				28 day			
			GRADE 1	GRADE 2	GRADE 3	Average grade	GRADE 1	GRADE 2	GRADE 3	Average grade
Lighting program	CL	$\bar{X} \pm Sd$	82,05±8,81	16,86±7,49	1,09±2,01	1,20±0,43	75,03±9,80	20,92±7,90	4,05±5,00	1,31±0,55
	DGL	$\bar{X} \pm Sd$	84,25±4,81	15,20±4,84	0,55±1,54	1,15±0,36	74,73±9,56	21,29±6,10	3,98±4,27	1,32±0,56
Population density	HD	$\bar{X} \pm Sd$	81,01±7,75	17,36±6,64	1,63±2,25	1,20±0,43	69,91±9,49	23,72±6,76	6,37±4,59	1,37±0,60
	LD	$\bar{X} \pm Sd$	85,30±5,74	14,70±5,74	0,00±0,00	1,14±0,35	79,84±6,39	18,49±6,19	1,67±3,09	1,22±0,46
LP			ns	ns	ns	ns	ns	ns	ns	ns
PD			ns	ns	ns	ns	*	ns	*	*
Interakcion LP x PD			ns	ns	ns	ns	ns	ns	ns	ns

*Statistically significant difference ($P < 0,05$) : **Statistically significant difference ($P < 0,01$); ns-no significant difference ($P > 0,05$)

Table 2: The average score and the incidence (%) lesions on the foot pads 35 and 42 days old chicks

Treatment	The level of factor	Frequency	35 day				42 day			
			GRADE 1	GRADE 2	GRADE 3	Average grade	GRADE 1	GRADE 2	GRADE 3	Average grade
Lighting program	CL	$\bar{X} \pm Sd$	65,20±10,20	26,77±7,93	8,03±4,72	1,45±0,65	63,07±12,14	25,22±7,45	11,71±7,59	1,53±0,72
	DGL	$\bar{X} \pm Sd$	70,10±11,14	21,94±8,23	7,96±4,11	1,40±0,65	65,20±14,84	26,25±11,48	8,55±4,51	1,47±0,66
Population density	HD	$\bar{X} \pm Sd$	59,99±8,39	29,32±7,56	10,69±3,43	1,50±0,68	52,95±6,88	32,09±8,08	14,96±4,41	1,62±0,73
	LD	$\bar{X} \pm Sd$	75,31±6,12	19,38±5,52	5,31±3,29	1,30±0,57	75,31±6,12	19,38±5,52	5,31±3,29	1,30±0,57
LP			ns	ns	ns	ns	ns	ns	ns	ns
PD			**	*	*	**	**	**	**	**
Interakcion LP x PD			*	*	ns	*	**	*	**	**

*Statistically significant difference ($P < 0,05$) : **Statistically significant difference ($P < 0,01$); ns-no significant difference ($P > 0,05$)

Conclusion

On the appearance of lesions on the foot pads applied lighting programs had no effect in either study period. Population density did not affect on the appearance of lesions 21 days, or between 28 days to the end of the fattening period. Higher densities causes a higher percentage of serious lesions on the foot pads (grade 2 and 3).

Material and methods

The experiment involved 320 chickens line Cobb 500, mixed sex, a tour lasted 42 days. The floor area of the building was covered with sawdust thickness of 10 cm.

Factors in this experiment were: 1) lighting program (constant-CL, and declining - DL, and then growing light -GL and 2) density (lower density - LD and higher density - HD). The chickens were divided into four groups in the form of two-factorial trial randomized block design (2x2), with four replicates and 15 birds per repetition for LD and 25 birds per repetition of HD, namely: a) chickens raised in a constant light (CL) and a lower density (LD); b) chickens raised in a constant light (CL) and higher population density (HD); c) chickens raised in light of the declining-growing light (DGL) and a lower density (LD); d) chickens raised in light of the declining-growing light (DGL) and higher population density (HD).

Assessment of damage foot pads and the presence of lesions and score the soles of broiler chickens in all experiments was performed 21, 28, 35 and 42 days. In all experiments rated the state foot pads in all chickens at three-level method for evaluation of dermatitis (Tomas et al. 2004) and score 1; 2 and 3. In addition, the difference being stricter criteria for assessing the 1 that indicates the foot pads without lesions; Grade 2 is assigned to moderately severe lesions and the grade 3 for severe lesions .



Grade: 1



Grade: 2



Grade: 3

Effect of lighting program on the occurrence of damage foot pads not confirmed at 35 and 42 days (Table 2), but it is depend on the population density. In chickens fattened at higher densities day 35, a statistically significantly higher incidence of lesions with grade 2 and 3, while the percentage of chicks without lesions was statistically significantly higher ($P < 0.01$) in the group of chickens fattened at a lower density compared to one at a higher density. The effect of population density 42 day was statistically highly significant ($P < 0.01$) on the occurrence of damage foot pads.



Chickens line Cobb 500