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INCIDENCE OF FOOTPAD DERMATITIS AND HOCK BURNS IN BROILERS AS AFFECTED BY GENOTYPE, LIGHTING PROGRAM AND LITTER TYPE*

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Abstract

The aim of this study was to define the conditions for improving broiler leg health, thus ultimately promoting broiler welfare and greater economic efficiency of production, by investigating the effects of litter type, lighting program, or genetic predisposition on the incidence and severity of footpad dermatitis and hock burns. The study was conducted on broiler genotypes (G) Hubbard Classic and Ross 308. Litter (L) was either chopped straw or wood shavings. Lighting programs (LP) were applied when broilers were eight days old. One lighting program (LP1) was designed so that chicks between 8 to 39 days of age were exposed to 16L:4D:2L:2D, and received 23L:1D between 40 to 42 days of age. The other lighting program (LP2) was a gradual extension of photoperiod after restrictions in the second week: 16L:8D (8–14 days), 16L:3D:2L:3D (15–21 days), 16L:2D:4L:2D (22–28 days), 16L:1D:6L:1D (29–35 days) and 23L:1D (36–42 days). Evaluations of footpad lesions and hock burn, according to the method described by Thomas et al. (2004), were carried out individually for each bird, on days 21 and 42. Based on the average score and the frequency of the worst forms of footpad dermatitis, better growing conditions for broilers were found when wood shavings were used as litter material rather than the chopped straw (P<0.01), and when a lighting program with gradual lengthening of photoperiod and with intermittent light/dark periods (LP2) was applied, compared to a moderate-constant photoperiod lighting program (LP1) (P<0.01). The Ross 308 broiler genotype, despite its lower body weight, showed a greater tendency to develop footpad dermatitis and hock burns. Hock burns developed more slowly than footpad dermatitis, and thereby, would be likely to exhibit a smaller adverse effect on broiler welfare and quality of chicken feet.

Key words: broiler, genotype, lighting program, litter, dermatitis

Leg health and therefore the incidence and severity of dermatitis in the region of the foot and ankle is an important indicator in assessing the welfare of broilers.

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Difficulty in walking, accompanied by pain, reduces regular access to food and water, which, in addition to the disrupted welfare, leads to a reduced increase in body weight (Škrbić et al., 2012). Leg lesions can be a place of entry of bacteria that can spread through the bloodstream and cause infection of other tissues (Hester, 1994). In recent years, there has been increasing demand for good quality of chicken feet which realize significant market value; in this sense, the incidence of footpad dermatitis is also an economic problem (Shepherd and Fairchild, 2010). These are the main reasons to intensively study possible factors associated with higher lesions on broiler legs.

Footpad dermatitis is a form of contact dermatitis that is associated with litter quality which is in turn affected by housing conditions and management (Shepherd and Fairchild, 2010; De Jong et al., 2012). Quality of litter depends on the type of material used, its size and the thickness of the layer (Grimes et al., 2006; Bilgili et al., 2009), but also on the building's thermal performance and ventilation, stocking density (Dozier et al., 2005; Škrbić et al., 2010) and broiler nutrition (Škrbić et al., 2012). In most studies, litter moisture is cited as the most important factor for the occurrence of footpad dermatitis as are the associated influences of season, i.e. temperature and humidity (Shepherd and Fairchild, 2010; De Jong et al., 2014). Meluzzi et al. (2008) found a strong positive correlation (0.89) between the moisture content of the litter and the occurrence of footpad dermatitis; however, another study found no correlation (Eichner et al., 2007).

Light is an important exogenous factor that is used as a management technique, and this is based on the exposure of broilers to a given duration and distribution of photoperiod, light intensity and colour. Different lighting programs have the potential to change the behavior and physical activity of broiler chickens and thus are used to improve their welfare. Greater physical activity of chickens caused by regular alternation of light and darkness in intermittent lighting programs and total duration of photoperiod of 16 hours is considered to be important in improving broiler leg strength and minimizing foot problems (Škrbić et al., 2009). Research by Ferrante et al. (2006) has shown that increasing broiler activity due to lower stocking density and a moderate photoperiod (16L:8D) resulted in a lower occurrence of footpad lesions. Also, high intensity of light contributes to the increased activity of broilers, and in connection with this, Deep et al. (2010) found a linear reduction of the incidence of ulcerative footpad lesions with increasing light intensity.

Kestin et al. (1999) suggested that the predisposing factors that cause footpad lesions and hock burns are not only the result of poor management, but that also genetic predisposition to susceptibility to the development of footpad dermatitis plays a role. Accordingly, Ask (2010) found a genetic variability between and within commercial broiler lines in regard to footpad and hock burns which, according to the author, provides the possibility of selection without any negative impact on the genetic improvement of body weight of broilers. On the contrary, continuous selection for body weight without the involvement of both forms of dermatitis in the selection targets will likely increase the tendency of their incidence. Several authors reported a higher incidence of footpad dermatitis in fast-growing compared to slow-growing broiler hybrids (Kjaer et al., 2006; Allain et al., 2009).

The subject of the present study is the effect of genotype, type of litter material and lighting program on the incidence and severity of footpad dermatitis and hock burns, for the purpose of defining the conditions to improve the leg health and, therefore, broiler welfare, and realize greater economic efficiency of production.

Material and methods

A total of 800 one-day-old chicks of two genotypes (G): Hubbard Classic or Ross 308 were housed in 32 pens (25 birds per pen) in a floor system with a stocking density of 13 birds/m^2. The litter (L) consisted of two materials – chopped straw or wood shavings, with equal layer thickness of 10 cm for both treatments. From the time broilers hatched until they were 8 days old, they were exposed to continuous light 23L:1D; thereafter, lighting programs (LP) were applied. One lighting program (LP1) was designed so that chicks from 8 to 39 days were exposed to 16L:4D:2L:2D and from 40 to 42 days, they received 23L:1D. The second lighting program (LP2) was a gradual extension of photoperiod after restriction in the second week, and which produced intermittent light/dark periods: 16L:8D (8–14 days), 16L:3D:2L:3D (15–21 days), 16L:2D:4L:2D (22–28 days), 16L:1D:6L:1D (29–35 days) and 23L:1D (36-42 days). All chicks were fed the same corn-soybean diet *ad libitum*. Water supply to chickens was also *ad libitum*, with automatic bell drinkers.

The trial design was a three factorial (G × LT × LP) arrangement with 8 treatments (2 × 2 × 2) in a randomized complete block design and 4 replications per treatment combination. Evaluation of the occurrence and severity of footpad lesions and hock burns, according to the method of Thomas et al. (2004), was performed for each bird in the study, with broilers aged 21 and 42 days. Footpad lesions were scored using the three point scale: score 1 = no lesions; score 2 = mild lesions; score 3 = severe lesions. According to the same scale, hock burns were also evaluated. All broilers included in the study were weighed individually, at 21 and 42 days of age. Moisture content of litter was measured at the same time. Five samples were taken from each pen, and these were combined to provide an average litter sample per pen. The moisture content of each average litter sample was determined by comparing the weights before and after drying the sample at 105ºC to a constant weight.

Data were analyzed by ANOVA followed by LSD post hoc test using StatSoft software (STATISTICA 8, 2007). Statistical analysis of the frequency of scores of footpad dermatitis and hock burns in the broiler groups was performed after the arc sin transformation of the data while for the purpose of more clear perception of the results, data in the tables are presented in percentage form.

Results

Analysis of the moisture content of litter in the current study showed that the average moisture content was between 40 and 50% in litter taken from pens when

broilers were 21 and 42 days old, and that the moisture content in litter from each of the pens did not significantly differ between the treatments (Table 1).

Table 1. Average litter moisture content at 21 and 42 days of broilers' age

Treatment	n	21 d	42 d
Genotype:			
Hubbard	16	41.63±5.89	42.11±3.72
Ross	16	49.75±3.47	53.0±4.42
Litter:			
wood shavings	16	42.94±5.96	44.92±3.51
chopped straw	16	48.48±3.71	50.19±5.25
Lighting program:			
LP2	16	43.67±4.94	44.68±4.58
LP1	16	46.75±5.49	51.44±3.63
Source of variation:			
genotype (G)		NS	NS
litter (L)		NS	NS
lighting program (LP)		NS	NS

Data are given as mean ± standard error; NS – not significant.

The effect of genotype, litter material and lighting program on average score of footpad and hock burns at both 21 and 42 days is shown in Table 2. Ross 308 broilers showed significantly higher average footpad score, compared to Hubbard Classic broilers at 21 days of age. Better condition of footpads, based on the average footpad score, occurred when wood shavings was used as bedding, rather than straw ($P<0.01$) and when broilers were exposed to the lighting program with gradual extension of photoperiod (LP2) compared to the lighting program with a constant-moderate photoperiod (LP1) ($P<0.01$).

Table 2. Effects of genotype, litter and lighting on average score of footpad and hock burns in broilers at 21 and 42 days of age

Treatment	n	Footpad		Hock burns	
		21d	42d	21d	42d
Genotype:					
Hubbard	16	1.22±0.02	1.74±0.036	1.03±0.007	1.29±0.026
Ross	16	1.46±0.033	2.46±0.03	1.01±0.004	1.53±0.034
Litter:					
wood shavings	16	1.17±0.03	1.85±0.037	1.02±0.005	1.24±0.024
chopped straw	16	1.51±0.024	2.36±0.034	1.03±0.006	1.58±0.034
Lighting program:					
LP2	16	1.28±0.021	1.98±0.037	1.01±0.004	1.50±0.034
LP1	16	1.40±0.033	2.24±0.037	1.03±0.007	1.29±0.026
Source of variation:					
genotype (G)		**	**	*	**
litter (L)		**	**	NS	**
lighting program (LP)		**	**	*	**

Data are given as mean ± standard error; * $P\leq0.05$; ** $P\leq0.01$; NS – not significant.

The frequency of scores of footpad lesions in broilers at 21 days of age is shown in Table 3. The percent of broilers with no footpad lesions (score 1) and the development of moderate footpad lesions (score 2) were affected by broiler genotype (P=0.017 and P=0.022, respectively) and the type of litter (0.001 and P=0.002, respectively). Ross 308 broilers had the highest frequency of moderate lesions compared to Hubbard Classic, and the treatment with chopped straw compared to wood shavings. However, in these young 21-day-old broilers, there was no effect of genotype (P=0.329) or litter (P=0.117) on the frequency of severe footpad lesions (score 3). The lighting program had no impact on the frequency of scores 1, 2 and 3 of footpad lesions at 21 days of age (P=0.1; P=0.08 and P=0.69, respectively). There was no significant interaction effect of genotype, litter type and lighting program on the occurrence and severity of footpad dermatitis in broilers at 21 days of age.

Table 3. Frequency of occurrence of footpad lesions, scored from 1 to 3, in broilers at 21 days of age

Treatment	n	Frequency of score (%)		
		1	2	3
Genotype:				
Hubbard	16	78.8	20.3	0.9
Ross	16	60.7	37.4	1.9
Litter:				
wood shavings	16	85.9	13.7	0.4
chopped straw	16	53.7	43.9	2.4
Lighting program:				
LP2	16	75.9	35.0	1.4
LP1	16	63.7	22.7	1.4
Source of variation:				
genotype (G)		*	*	NS
litter (L)		**	**	NS
lighting program (LP)		NS	NS	NS

*P≤0.05; **P≤0.01; NS – not significant.

In older broilers (42 days of age), the differences in the average score of footpad lesions between the genotypes, litter types and lighting programs (Table 2) were confirmed as was noted for 21-day-old broilers. Differences compared to the younger broilers were: higher incidence of severe scores at 42 days (Table 4) as compared to 21 days of age and significant interactions of the studied factors. Genotype and litter type affected the significant differences in the percentages of broilers without lesions and those with severe lesions, whereas neither genotype nor litter type affected the incidence of mild lesions (Table 4). The LP1 lighting program showed a statistically significant effect on the incidence of severe forms of footpad dermatitis (P=0.004). Based on the data presented (Table 4), the genotype of broilers interacted with the lighting programs in regard to the development of severe footpad lesions (P=0.043). This indicates that broilers of Hubbard Classic genotype showed a better condition of footpads when they were exposed to LP2 compared to LP1 lighting program. In the interaction between genotype and the type of litter the frequency of moderately severe lesions (score 2) was significantly affected. Specifically, the treatment Hub-

bard Classic genotype with chopped straw and treatment Ross 308 genotype with wood shavings affected the higher incidence of footpad lesions.

Table 4. Frequency of occurrence of footpad lesions, scored from 1 to 3, in broilers at 42 days of age

Treatment		n	Frequency of score (%)		
			1	2	3
Genotype:					
Hubbard (H)		16	43.4	40.5	16.1
Ross (R)		16	6.2	41.2	52.6
Litter:					
wood shavings (WS)		16	36.5	43.5	20.0
chopped straw (CS)		16	13.0	38.2	48.8
Lighting program:					
LP2		16	30.1	43.6	26.3
LP1		16	19.5	38.0	42.5
G × LP	H × LP2	8	54.18 a	40.38	5.44 c
	H × LP1	8	32.58 b	40.63	26.79 b
	R × LP2	8	6.08 c	46.81	47.1 ab
	R × LP1	8	6.34 c	35.49	58.17 a
G × L	H × WS	8	62.7	31.37 B	5.93
	H × CS	8	24.06	49.63 A	26.31
	R × WS	8	10.41	55.58 A	34.01
	R × CS	8	2.0	26.75 B	71.25
Source of variation:					
genotype (G)			**	NS	**
litter (L)			**	NS	**
lighting program (LP)			NS	NS	**
G × LP			*	NS	*
G × L			NS	**	NS

*P≤0.05; **P≤0.01; NS – not significant.
a, b – values in column with different letters differ significantly (P≤0.05).
A, B – values in column with different letters differ significantly (P≤0.01).

Compared to footpad dermatitis, a lower incidence of hock burns was found in 21-day-old broilers (Table 5). The vast majority of broilers (97–98%) had no hock burns at this age, and the others had moderate forms, while the most severe forms did not occur. The lighting program interacted significantly with litter on the frequency of broilers with no hock burns and the moderately severe form ($P<0.05$). Broilers housed on wood shavings and exposed to LP2 lighting program had a total absence of hock burns at 21 days of age as compared to the treatment LP1 with wood shavings.

The second evaluation of occurrence and severity of hock burns, when broilers were 42 days of age, showed significant main effects of all three examined factors on the frequency of hock burn scores (Table 6). As with scores for footpad lesions in broilers of the same age, Ross 308 genotype broilers had a higher average score (meaning more severe dermatitis) compared to Hubbard Classic broilers; this also occurred when broilers were housed on straw compared to wood shavings. However, contrary to the footpad lesions, hock burns in broilers exposed to LP1 lighting pro-

gram had a lower average score compared to LP2 (Table 2). The effect of genotype is reflected in significant differences in the frequency of broilers without hock burns and with the most severe forms of these lesions (Table 6). The type of litter exhibited an effect on the incidence of all kinds of hock burns, while the lighting program with a moderate-constant photoperiod significantly reduced the incidence of the most severe forms of hock burns compared to the lighting program with a gradual extension of photoperiod and an intermittent light/dark routine.

Table 5. Frequency of occurrence of hock burns, scored from 1 to 3, in broilers at 21 days of age

Treatment		n	Frequency of score (%)		
			1	2	3
Genotype:					0
Hubbard (H)		16	97.2	2.8	0
Ross (R)		16	98.6	1.4	
Litter:					0
wood shavings (WS)		16	98.2	1.8	0
chopped straw (CS)		16	97.6	2.4	
Lighting program:					0
LP2		16	97.1	2.9	0
LP1		16	98.7	1.3	
L × LP	WS × LP2	8	100.0 a	0 a	0
	WS × LP1	8	96.44 b	3.56 b	0
	CS × LP2	8	97.48 b	2.52 b	0
	CS × LP1	8	97.75 ab	2.25 ab	0
Source of variation:					
genotype (G)			NS	NS	
litter (L)			NS	NS	
lighting program (LP)			NS	NS	
L × LP			*	*	

*P≤0.05; NS – not significant.
a, b – values in column with different letters differ significantly (P≤0.05).

Table 6. Frequency of occurrence of hock burns, scored from 1 to 3, in broilers at 42 days of age

Treatment	n	Frequency of score (%)		
		1	2	3
Genotype:	16	75.3	20.8	3.9
Hubbard	16	58.6	28.1	13.3
Ross				
Litter:	16	80.2	16.0	3.8
wood shavings	16	53.7	32.9	13.5
chopped straw				
Lighting program:	16	59.0	28.6	12.4
LP2	16	74.9	20.3	4.8
LP1				
Source of variation:				
genotype (G)		*	NS	*
litter (L)		**	**	*
lighting program (LP)		NS	NS	*

*P≤0.05; **P≤0.01; NS – not significant.

Ross 308 broilers, which showed a higher sensitivity in regard to the occurrence of footpad dermatitis and hock burns, had lower body weight (P<0.01) when they were 21 or 42 days old as compared to Hubbard Classic broilers (Table 7). Body weight was not influenced by the litter type (P=0.229). However, broilers exposed to LP2 presented lower body weight at the age of 21 days (P=0.005).

Table 7. Body weight (g) of broilers at 21 and 42 days of age

Treatment	n	Body weight 21 days	Body weight 42 days
Genotype:			
Hubbard	16	694.11±6.21	2164.60±18.53
Ross	16	661.63±5.68	2063.09±16.78
Litter:			
wood shavings	16	674.47±6.30	2128.02±18.34
chopped straw	16	680.78±5.70	2097.42±17.29
Lighting program:			
LP2	16	665.96±6.52	2107.06±18.51
LP1	16	689.13±5.39	2117.76±17.14
Source of variation:			
genotype (G)		**	**
litter (L)		NS	NS
lighting program (LP)		**	NS

Data are given as mean ± standard error; **P≤0.01; NS – not significant.

Discussion

Based on its role in thermal insulation, moisture absorption and as a protective barrier, the litter should provide a sense of comfort to broilers. Litter also has a role in the foraging and dustbathing behavior. In this regard, it should not be too wet, but also not dry, in order to preserve the respiratory health. Litter moisture is considered an important factor for the occurrence of contact dermatitis, although there are studies indicating the increasing importance of higher temperatures of the litter regardless of the moisture content, in the sense that higher air and litter temperatures may alter the decomposition process in wet litter (Wang et al., 1998). Our current results showed that litter moisture was not directly related to the incidence or severity of footpad dermatitis and that additional predisposing factors are necessary for its development. These results are similar to and confirm those of earlier studies (Eichner et al., 2007; Nagaraj et al., 2007), however, in other studies (Allain et al., 2009; Youssef et al., 2010; De Jong et al., 2014) footpad lesions have been found to be more severe as litter moisture increases. The criteria for selection of materials suitable for litter are the absorption capacity, the time required for drying, tendency to form clumps, availability and price. Types of materials used for the litter are mainly determined regionally. In order to rationalize production, alternative materials have been examined, such as sand, paper, and rice husk (Grimes et al., 2002). By comparing the alternative materials used for the litter and pine shavings, no significant

differences in the occurrence of footpad dermatitis were found (Grimes et al., 2006). Due to its drying capacity, sand is considered suitable material for litter (Bilgili et al., 2009). In Europe, straw and wood shavings are traditionally used as litter material in poultry houses. In the present study straw litter and litter made of wood shavings were compared and a lower incidence of footpad and hock burn lesions was found when wood shavings were used as litter. Similar results have been found by Su et al. (2000) and Meluzzi et al. (2008). Regardless of the broiler age, footpad lesions were more severe in broilers housed on straw rather than on wood shavings, which is probably related to the physical structure (with sharp edges) and crustiness, attributes of straw, leading to the development of skin lesions. Conditions related to litter which are essential for the development of footpad dermatitis usually cause other forms of dermatitis too, such as hock burns and breast blisters (Haslam et al., 2007; Allain et al., 2009). A strong positive correlation ($r = 0.79$) between footpad dermatitis and hock burns was found by Meluzzi et al. (2008). However, hock burns develop slowly, even in the conditions favorable for their development, as confirmed by our observations of broilers aged 21 days (when no broilers had severe hock burns) and 42 days (when severe hock burns were relatively common). This may be related to an increase in body weight and changes in physical activity of broiler chickens which determine the duration of contact of the ankle with litter (Kjaer et al., 2006; Hepworth et al., 2010; Đukić Stojčić and Bessei, 2011). However, the results of our study did not confirm any positive correlation between body weight of broilers and the occurrence of contact dermatitis.

The effects of various aspects of lighting programs, including photoperiod, intensity and colour, result in changes in physical activity of broiler chickens (Lewis and Morris, 1998; 2000). The changing stimulating effect of color of light on the retina and changes in behavior that may affect broiler growth and development have been described by Lewis and Morris (2000). The application of light of extremely low intensity decreased the activity of broilers, reduced their performance of fundamental behaviors and increased the occurrence of ulcerative footpad lesions in the study of Deep et al. (2010). However, in another study, no effects of light intensity and source on health of the legs, gait score, footpad and hock burns were found (Kristensen et al., 2006). The average score for footpad lesions was higher in the conditions of longer photoperiod in the study by Schwean-Lardner et al. (2013), and previous research of those authors (Schwean-Lardner et al., 2012) may be relevant to this topic, as they found that broilers decreased their physical activity linearly with prolongation of photoperiod when they were of younger age and squared when they were older. In contrast, in the present study, exposure of broilers to a lighting program with gradual extension of photoperiod (LP2) resulted in a lower average score and lower frequency of the most severe forms of footpad lesions. The possible reason was that our constant extension of the photoperiod, after the initial restriction, was not in a block, but rather, was intermittent with short dark periods, so that this lighting program, in addition to a long photoperiod, also had produced intermittent lighting. Exposure of broilers to intermittent light contributes to their greater activity, which was confirmed in a study of behavior patterns at an early stage of breeding (Ohtani and Tanaka, 1998). Based on that, the more frequent alternation of light and

dark periods in our LP2 compared to LP1 lighting program had a stimulatory effect on the physical activity of broilers and resulted in improved assessment of footpad lesions, particularly for older broilers.

The results showed that in 21-day-old broilers, a significant impact of the light program on the state of the footpads cannot be expected because of short exposure and small initial differences in applied lighting programs. Rather, the effect of lighting programs on broilers of this age was exhibited on body weight, which was significantly lower in LP2 than in LP1 conditions due to greater restrictions of photoperiod. However, the footpad lesions which developed at this stage of broiler growth under the influence of litter and genotype were an important basis for damage to the deeper layers of tissue over time. In support of this, in examining the differences in the percentages of broiler chickens without lesions and those with severe lesions at 21 and 42 days, there was a significant difference between frequencies of score 3 in older broilers, taking into account the effects of litter and genotype.

The condition of the litter also changes depending on the activity of broilers, as greater broiler movement contributes to faster drying and better quality of litter. This likely explains the significant interactions we observed between our lighting programs and the litter material. The results also indicated the importance of the interaction of lighting program with broiler genotype, as in the current study Hubbard Classic broilers showed better condition of footpads when they were exposed to LP1 compared to LP2 light program, while Ross 308 showed the opposite response.

In addition to environmental conditions and management techniques, broiler genotype is also a predisposing factor in the development of footpad and hock dermatitis (Allain et al., 2009). Significant differences were found between the two genotypes for both forms of dermatitis and at both 21 and 42 days of age. Broilers of Ross 308 genotype developed footpad dermatitis and hock burns more frequently compared to Hubbard Classic broilers. Similarly, Sanotra et al. (2003) reported a greater incidence of footpad lesions in Sweden in Ross hybrids compared to Cobb. Generally, Ross 308 broilers showed less tolerance of reduced welfare levels associated with environmental condition compared to Hybro and Hubbard Flex broilers (Skomorucha et al., 2010). Also, Ross 308 broilers had a higher incidence of footpad and hock burns compared to slow-growing hybrids of a combined type (Kjaer et al., 2006). The established differences between fast- and slow-growing genotypes in the occurrence and severity of the lesions on the legs may be associated with different rearing conditions. The estimated heritability values for footpad dermatitis and hock burns in commercial broiler flocks in the study of Kjaer et al. (2006) were 0.31 and 0.08, respectively. These results indicate that the genetic selection can be used to prevent the occurrence of footpad dermatitis. This is supported by the low, although insignificant correlation between footpad dermatitis and body weight of broilers found in the current study. These results could have a significant impact on the direction of genetic selection of fast-growing broiler hybrids and in this regard, even more pronounced differentiation of hybrids in their propensity to develop dermatitis on the footpads can be expected in the future.

In conclusion, the current study confirmed the importance of rearing conditions and management techniques but also pointed to a genetic predisposition for the de-

velopment of broiler footpad lesions. On the basis of average scores and the frequency of the most severe forms of footpad dermatitis, better conditions for rearing broilers will be achieved if wood shavings are used as litter material rather than chopped straw, and/or if a lighting program with gradual extension of photoperiod and with intermittent lighting is used, rather than lighting with a moderate-constant photoperiod. Broilers of Ross 308 genotype, despite their lower body weight, showed a greater tendency to develop footpad dermatitis and hock burns. Also, broiler genotype is an important interactive factor together with lighting program and the type of litter, affecting the occurrence of footpad dermatitis. Compared to the footpad, hock burns developed slowly. In general, the most severe forms of dermatitis developed over time. In the current experiment litter moisture content had no effect on the development of these forms of dermatitis in broilers.

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