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NOTA BREVE

THE INFLUENCE OF SOME FACTORS ON CARCASS DEFECTS DURING FATTENING PERIOD IN BROILERS

INCIDENCIA DE ALGUNOS FACTORES SOBRE DEFECTOS DE LA CANAL DE POLLOS DURANTE EL ENGORDE

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ADDITIONAL KEYWORDS

Husbandry. Animal welfare.

PALABRAS CLAVE ADICIONALES

Manejo. Bienestar animal.

SUMMARY

The aim of present study was to determine the effect of slaughtering age, stocking density, gender, litter type, feeder type and poultry house type on the possible carcass defects such as broken bones, joint defects, breast blister, blood and bruise on breast, thigh and wing, breast bruise. The incidence of these carcass defects decreased with increasing age of broiler. The incidence of broken bones, joint defects and breast bruise increased with increasing stocking density. The incidence of joint defects and blood and bruise on thigh for female were significantly higher than those for male broiler. There are no significant differences among litter type in terms of the carcass defects of broilers. There are no significant differences among type of feeder and of house in terms of incidence of carcass defects measured in this experiment. Broken bones, bruising and other defects with carcass indicate adverse animal welfare and loss in product yield. This experiment determined the nature and incidence of defects contributing to the total.

RESUMEN

El propósito de este trabajo fue determinar el efecto de la edad de sacrificio, densidad de población, sexo, tipo de yacija, tipo de alimentador y tipo de gallinero sobre posibles defectos de la canal tales como huesos rotos, defectos articulares, erosiones en la pechuga, sangre y hematomas de la pechuga, muslo o alas, hematomas de la pechuga. La incidencia de estos problemas decreció al aumentar la edad del ave. La incidencia de huesos rotos, defectos articulares y hematomas en la pechuga aumentó con la densidad de población. Los defectos articulares y sangre o hematomas del muslo en las hembras fueron más frecuentes que en los machos. No se encontraron diferencias entre tipos de yacija, tipos de alimentador o tipo de gallinero. Huesos rotos, hematomas u otros defectos indican ausencia de bienestar y pérdidas económicas. Se determinó la contribución al total de la naturaleza e incidencia de defectos.

INTRODUCTION

The factors affecting the broiler meat quality can be examined in the three periods, fattening, slaughtering, processing periods (Gurer *et al.*, 1991; Yalcın and Kocak, 1992). Color of poultry meat is very important because consumers associate it with the product's freshness and they decide whether or not to buy the product based on their opinion of its attractiveness. Poultry meat colour is affected by several factors such as bird age, sex, pre-slaughter conditions and processing variables. Color of meat is related to the amount of presence of muscle pigments myoglobin and hemoglobin. Another major cause of poultry meat

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discoloration is bruising (Northcutt, 1997).

The determination of the factors affecting the poultry meat quality is very important issue for the poultry industry to eliminate their possible negative effect on broiler meat quality. The poultry industry generally tries to identify where, how and when these factors affecting the poultry meat quality although this is very difficult task to determine.

The aim of present study was to determine the effect of slaughtering age, stocking density, sex, litter type, feeder type and poultry house type on the possible carcass defects in Turkey.

MATERIALS AND METHODS

Animal material was obtained from broiler producers which have contracts with KOYTUR Ltd. in Turkey, Tarsus in November 2002 and March 2003. The factors such as slaughtering age (36-40, 41-44 and 45-50 day) stocking density (11-13, 14-16 and 17-20 broiler/m^2), gender (male and female), litter type (wood shaving, wheat straw, and rice hull), feeder type (hanging feeder, spiral feeder and automatic chain feeder) poultry house type (open sided house and controlled-environment house) on the possible carcass defects such as broken bones, joint defects, breast blister, blood and bruise on breast; thigh and wing, breast bruise (Gezertekin and Yalcın, 1999) were examined in 49 poultry houses. 100, 200, 300 and 500 broiler carcass were taken from poultry houses where their capacity of 4000, 4000-8000, 8000-12 000 and 12 000-16 000 respectively. Total 8500 carcasses were evaluated for the incidence of a common array of defects at predetermined locations. Mean statistical differences were considered significant at $p<0.05$.

RESULTS AND DISCUSSION

The effect of slaughtering age, stocking density and gender on the carcass defects is given in **table I**. The incidence of broken bones ranged from 17.3 to 26.6%. The slaughtering age had a significant effect on the carcass defects. The slaughtering at 36-40 day age resulted in significantly higher incidence of broken bones than that obtained at 45-50 day age. In the current study the incidence of broken bones was early stage of growing was significantly higher than that obtained late growing stage. This result is not consistent with finding of Gezertekin and Yalcın (1999) and Nicol and Scott (1990) who found that increase of broken bone in young broilers closely related with heavy carcasses.

The incidence of joint defects at 41-44 day age was significantly higher than that obtained at 45-50 day age of broilers. There is no significant difference among the incidence of breast blister obtained three different ages. However it has been reported that formation of breast blister is related to carcass weight of broilers (Mayes, 1980).

The incidences of blood and bruise on thigh, wing and breast were significantly decreased with increasing age. The incidence of blood and bruise on breast at 41-44 day age was significantly lower than that obtained at 45-50 day age. The incidences of blood and bruise on thigh and wing at 45-50 day age were significantly lower than those obtained at early growing stages. This result is in agreement with findings of Bilgili (1990) and Gezertekin and Yalcın (1999). Although the incidence of breast bruise was also decreased with increasing age the incidence of breast bruise at 41-44 day age was significantly lower that that obtained at 36-40 day age. It was reported that high incidence of bruise and blood in wings was related to electric shock during slaughtering (Summers, 2004).

The stocking density had a significant ($p<0.05$) effect on some of carcass defects. The incidences of broken bones and joint defects increased with increasing stocking density whereas the incidence of breast bruise decreased with increasing stocking

Table I. *The effect of slaughtering age, stocking density and gender on the carcass characteristics.* (Efecto de la edad de sacrificio, densidad de poblacióny sexo sobre las características de la canal).

Carcass defects	Slaughtering age (day)			Stocking density (broiler/m^2)			Gender	
	36-40	41-44	45-50	11-13	14-16	17-20	Male	Female
Broken bones	26.6 ± 2.27^{b}	23.7 ± 5.45^{ab}	17.3 ± 2.82^{a}	13.1 ± 1.60a	23.6±2.18^{ab}	25.4±2.10^{b}	21.2 ± 2.79	25.2±1.67
Join defects	16.9 ± 1.79^{ab}	19.9 ± 3.23^{b}	9.0 ± 2.75^{a}	8.2 ± 4.71a	17.2±2.67^{b}	17.0±2.02^{ab}	11.9 ± 2.41^{a}	19.1±2.02^{b}
Breast blister	2.0 ± 0.64	2.0 ± 0.54	2.4 ± 1.02	3.5 ± 2.40	2.3±0.58	1.6±0.49	2.5 ± 0.69	1.8±0.46
Blood and bruise on breast	2.4 ± 0.37^{ab}	1.2 ± 0.30^{a}	5.9 ± 0.90^{b}	1.3 ± 0.81	2.7±0.51	2.7±0.53	3.3 ± 0.66	2.2±0.39
Blood and bruise on thigh	52.0 ± 2.24^{c}	33.4 ± 3.47^{b}	18.4 ± 4.66^{a}	29.8 ± 18.44	36.1±3.96	42.6±3.05	30.0 ± 4.59^{a}	43.2±2.85
Blood and bruise on wing	88.8 ± 1.09^{c}	78.5 ± 2.30^{b}	64.0 ± 6.62^{a}	76.2 ± 8.96	77.0±2.10	83.8±3.70	79.0 ± 2.92	80.9±2.67
Breast bruise	29.5 ± 3.14^{b}	19.1 ± 2.34^{a}	20.9 ± 3.07^{ab}	34.3 ±12.51b	23.0±2.66^{a}	24.1±2.54^{ab}	25.4 ± 2.79	23.1±2.39

^{a,b,c}Row means with common superscript do not differ (p>0.05).

Table II. *The effect of type of litter, feeder and house on the carcass characteristics.* (Efecto del tipo de yacija, alimentador y gallinero sobre las caracteristicas de la canal).

Carcass defects	Type of litter			Type of feeder			Type of house	
	Wood shaving	Wheat straw	Rice hull	Hanging	spiral	Automatic chain	Open sided	Controlled environment
Broken bones	24.4±2.01	22.8±2.61	23.5±4.29	24.0±1.87	24.5±3.43	20.9±2.97	24.0±1.71	23.0±2.93
Join defects	15.7±1.84	16.9±2.96	20.5±8.47	17.7±2.17	15.0±2.99	13.7±3.71	16.5±1.83	16.9±3.65
Breast blister	2.4±0.52	2.0±0.70	0.2±0.24	2.4±0.51	1.3±0.51	1.4±1.24	2.1±0.44	1.7±0.83
Blood and bruise on breast	2.9±0.44	2.2±0.51	2.3±1.91	2.3±0.34	2.8±0.95	3.5±1.47	2.4±0.35	3.4±0.99
Blood and bruise on thigh	39.5±3.13	36. ±5.34	40.7±8.22	40.6±3.46	32.2±3.79	39.8±7.46	39.8±2.96	34.5±5.39
Blood and bruise on wing	83.1±1.95	76.0±4.88	77.7±3.86	82.3±1.87	77.6±6.94	74.0±2.83	81.0±1.78	76.4±6.87
Breast bruise	26.2±2.48	21.0±3.17	19.7±4.63	24.9±2.40	18.8±3.17	27.5±4.5	24.1±2.22	23.2±2.91

^{a,b,c}Row means with common superscript do not differ (p>0.05).

density. This result is in agreement with findings of Bilgili (1990) and Saylam and Dogan (1995). The gender had no effects on the carcass defects except for join defects and blood and bruise on thigh. The incidence of joint defects and blood and bruise on thigh for female was significantly higher than that for male. This result is in agreement with findings of Bilgili (1990) who reported those females are more sensitive than male broilers.

The effect of litter, feeder house types on the carcass defects is given in **table II**. Litter, feeder and house types had no significant ($p>0.05$) effect on carcass defects measured in this experiment. This result is not in agreement with findings of Kundakci and Cetin (1995) and Yalcın *et al.* (1995) who found that type of litter had significant effect on the breast defects. This result is not in agreement with finding of Yalcın and Kocak (1992).

CONCLUSION

The incidence of broken bones, joint defects, blood and bruise on thing and wing, and breast bruising decreased with increasing age of broiler. The incidence of broken bones, joint defects and breast bruise increased with increasing stocking density. The incidence of joint defects and blood and bruise on thigh for female were significantly higher than those for male broiler. Broken bones, bruising and other defects with carcass indicate adverse animal welfare and loss in product yield. This experiment determined the nature and incidence of defects contributing to the total.

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