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GROWTH TRAITS OF GUINEA FOWL IN DIFFERENT PRODUCTION SYSTEMS

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Abstract

Two hundred day old guinea fowl keets were reared in free-range intensive system to determine the effect of production system on growth traits. All birds kept indoor until 7 weeks, and half of them had access to outdoor until 18 weeks of age. All birds were individually weighed with two weeks intervals. Feed consumption was determined and feed conversion ratio was calculated. Production system had a significant effect on live weight until 14 weeks of age (P<0.05) and intensively reared birds had higher live weights. The difference between the weights of free-range and intensive system was not significant between the ages of 14-18 weeks. Mean body weight of guinea fowls in free-range system was 1196.61 g, whereas 1203.8 g in intensive system. Male guinea fowls had significantly higher weights than females at all ages in both production systems (P<0.05). Male guinea fowls reached 1241.67 g at 18 weeks and females had a mean body weight of 1158.74 g at the same period. Birds reared in free-range system had significantly higher feed consumption at all ages. Production system had significant effect on feed conversion ratio (FCR), and intensively reared guinea fowls had better FCR.FCR of free-range guinea fowls was found as 6.43 and 5.80 in intensive system.

Key words: *guinea fowl, production system, free-range, live weight, feed conversion ratio.*

INTRODUCTION

Guinea Fowl are raised mainly for meat and egg production and hobby purposes (Joubert, 1980). In Africa, guinea fowl production has cultural significance as a traditional activity (Konlan et al., 2011), and guinea fowl meat and eggs are second to chicken eggs and meat in terms of poultry product consumption (Bernacki et al., 2013). The relatively high resistance of guinea fowl to poultry diseases has made them attractive to farmers in some parts of the world (Joubert, 1980), and the higher protein (23% vs 21%) and lower fat content (4% vs 7%) of guinea fowl meat in comparison to chicken (Nsoso et al., 2003) has spurred the production of guinea fowl as an alternative poultry enterprise, not only in developing countries (Nahashon et al., 2006), but in a number of European countries as well, particularly in France, Belgium and Scandinavia (Baeza et al., 2001).

In commercial production, guinea fowl are raised in confinement with management practices similar to those of chickens. But, they are mainly reared under extensive or semi-intensive systems (Karacay and Sarica, 2004), which, when compared to intensive systems, offer a number of advantages to producers, especially in developing countries. Their adaptability to different environmental conditions makes them attractive to farmers looking to raise small flocks in their yards under free-range production systems characterized by very low inputs, albeit low productivity as well.

The majority of studies related to guinea fowl focus on growth performance, meat quality and egg production, with only limited research investigating effects of different production systems on growth parameters. Therefore, this study assessed live weight, feed consumption and feed conversion ratios for guinea fowls

reared indoor and free-range systems until 18 weeks of age.

MATERIALS AND METHODS

This trial was conducted at the Ondokuz Mayis University Agricultural Faculty's Research Farm from May to August 2015. 200 day-old keets were randomly selected for use in the experiment.

Keets were randomly allocated to pens belonging to either an indoor or outdoor-access ('free range') production system that were interspersed within windowed houses, with 4 pens per system and 25 keets per pen. Pens (3.5 x 3.5 m) were separated and covered by 0.5x0.5 cm wire mesh to prevent birds from flying between pens. Each pen contained 1 round feeder and 1 round drinker. The indoor pen also contained an 8-cm layer of wood shavings used as litter, and no fresh litter was added during the production period. Heating was provided by infra-red heaters, and economic white bulbs were used for lighting. A 24-h light regime was applied during the first 3 days. Light was incrementally decreased over days 3-14 to 20 hours and then remained constant until 6 weeks, after which natural lighting (app.14 h/day) was applied until slaughter. After 6 weeks of age, birds in the outdoor 'free-range' system were given 24-hour access to outdoor pens measuring 14x3.5 m through a single doorway measuring 50x90 cm.

All birds were fed *ad libidum* with the same commercial broiler starter diet based on corn and soybean meal (230 g CP and 12.8 MJ ME, 13.5 g lysine, 4.50 g methionine, 10.0 g Ca, 5.00 g P, 120 mg Mn, 15 mg Cu, 100 mg Zn, 12000 IU Vit. A, 4200 IU Vit. D per kg). Water was also provided *ad libidum*. All birds were individually weighed from hatch to 18 weeks of age with two weeks intervals. Feed consumption, feed conversion ratios and mortality and was evaluated by replication and given as mean value per guinea fowl.

Statistical analysis

Statistical analysis was performed using the software SPSS Version 16. Analysis of variance with a factorial arrangement (production system, age and sex) was used to test the effects of production system, age, and the interactions between production system, age and gender. A level of $P<0.05$ was considered statistically significant.

RESULTS AND DISCUSSIONS

All birds were kept indoors until 7 weeks. Live weight, feed consumption, feed conversion ratio and mortality at first 6 weeks were given in Table 1. Feed conversion ratio was increased with age and this was an excepted result. Total mortality was found as 2% at first 6 weeks.

Live weights of guinea fowls at different ages, after birds had access outdoor were given in Table 2. Production system had a significant effect on live weight until 14 weeks of age ($P<0.05$) and intensively reared birds had higher live weights.

Table 1. Live weight, feed conversion ratio (FCR) and mortality of guinea fowl in first 6 weeks

Age (weeks)	N	Live weight (g)	Feed consumption (g)	FCR	mortality
Hatch	200	26.73	-	-	-
2	197	74.57	124.53	1.65	1.5
4	197	161.97	289.53	1.79	1.5
6	196	382.37	711.35	1.86	2.0

But, after this age, the difference between the weights of free-range and intensive system was not significant. Mean body weight of guinea fowls in free-range system was 1196, 61 g, whereas 1203, 8 g in intensive system. These weights were lower than the findings of Tjetjoo et al., (2013) and Nahashon et al., (2006) who found the mean body weight around 1400 g at 9 weeks of age. Genotype is an important factor on body weight gain. The parent stock of the animal material of current study was not selected for meat production. This could be the reason of lower weights occurred in this experiment.

Production system x gender interaction was not found significant. Male guinea fowls had significantly higher weights than females at all ages in both production systems ($P<0.05$). Male guinea fowls reached 1241.67 g at 18 weeks and females had a mean body weight of 1158.74 g at the same period. This was also an expected result and similar to other poultry species.

Table 2. Effect of production system on live weight changes of guinea fowl

Production system	Gender	Live weight (g/weeks)					
		8	10	12	14	16	18
Free-range	Male	548.64	750.08	953.59	1077.15	1194.55	1236.62
	Female	453.44	641.58	849.59	990.79	1105.75	1156.60
Intensive	Male	575.61	780.48	979.23	1102.32	1197.40	1246.72
	Female	500.67	687.65	898.37	1009.17	1108.58	1160.88
SEM		5.42	6.31	5.31	4.66	5.47	5.63
Effects							
Production system		**	**	**	*	NS	NS
Gender		**	**	**	**	**	**
P.System x gender		NS	NS	NS	NS	NS	NS
Production system	FR	501.04	695.83	901.6	1033.97	1150.15	1196.61
	INT	538.14	734.07	938.8	1055.75	1152.98	1203.8
Gender	M	562.13	765.28	966.41	1089.73	1195.97	1241.67
	F	477.06	664.62	873.98	999.98	1107.16	1158.74

Cumulative feed consumption and feed conversion ratios of guinea fowls at different ages in two production systems were given in Table 3. Birds reared in free-range system had significantly higher feed consumption at all ages. Total feed consumptions in free-range and intensive system were found as 7693.g and 6983.5 g, respectively. More physical activity in outdoor could be resulted as higher feed consumption. Production system had significant effect on feed conversion ratio, and intensively reared guinea fowls had better FCR. Nahashon et al. (2009) found the FCR of guinea fowl broilers to be around 2.5 at 8 weeks. This result is in parallel with the findings of our study.

Table 3. Feed consumption and feed conversion ratio (FCR) of guinea fowl at different ages

Production system	Age (weeks)	Feed consumption (g)	FCR
Free-range	8	1280.9	2.56
	10	2231.6	3.21
	12	3496.1	3.88
	14	4702.7	4.54
	16	6655.1	5.79
	18	7693.6	6.43
Intensive	8	1274.2	2.37
	10	2179.3	2.97
	12	3293.9	3.51
	14	4430.4	4.19
	16	6043.0	5.24
	18	6983.5	5.80
		Effects	
	8	**	**
	10	**	**
	12	**	**
	14	**	**
	16	**	**
	18	**	**

CONCLUSIONS

The result of this study showed that, there was not significant difference between live weight of guinea fowls reared in free-range and intensive systems. This finding is also notable, given the importance that animal welfare has gained among consumers in recent years and the fact that back-yard production is the most common form of guinea fowl production in many countries and represents a significant economic activity in rural areas. Selection of guinea fowl in live weight and feed consumption will benefit to increase profit and decrease fattening period.

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NUTRITION