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GROWTH PERFORMANCE AND MORTALITY IN HYBRID CONVERTER TURKEYS REARED AT HIGH ALTITUDE REGION

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Abstract

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This study was to evaluate growth performance and mortality in Hybrid Converter turkeys reared under intensive conditions at high altitude region. The present study was carried out at an altitude about 1725 metres above sea level. 5040 (mixed gender) for determination of survival rate and 340 (170 per gender) Hybrid Converter poults for growth performance were utilized in the study. The experiment was terminated at 105 day of age in female and 120 day of age in male poults. Hybrid Converter poults exhibit fast-growing traits, as was observed with the body weights of 9.644 and 12.7 kg at 105 d of age for female and male birds, respectively. Body weight of male poults was 16.094 kg at 120 d of age. The weights of the female and male turkeys did differ significantly ($P<0.001$). The highest coefficients of variation (CV) for body weight in female poults (9.50% at 75 d of age) and male poults (10.96 % at 15 d of age) were observed. In general, CV of body weights at growth period ranged from 8.12 to 16.69 %. The average mortality for Hybrid Converter poults was 4.25% at 120 d of age. The highest mortality (2.46%) was observed at 10-13 wk of age, while the lowest mortality (0.51%) was observed at 0-4 wk of age. The results of the experiment that growth performance of Hybrid Converter poults reared under intensive conditions at high altitude were within commercial standards. The highest mortality was observed at 10-13 wk of age, in which growth rate was also the highest, while the lowest mortality was observed at 0-4 wk of age, in which growth rate was the lowest.

Key words: hybrid turkey, high altitude, growth performance, mortality

Introductıon

The twentieth century, especially the second half, has brought an enormous increse in turkey production. The increase in production was made possible by the gradual development of sophisticated production systems, in which the increasing knowledge of housing, nutrition and disease management could be put to use. The dramatic increase of production volume and production efficiency per bird is, however, largeley attributable to ongoing genetic development of turkey stocks (Buddiger and Albers, 2009).

There are three dominant turkey genetic com-

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panies in the world that provide elite genetic stock (British United Turkeys, Hybrid Turkeys and Nicholas Turkey Breeding Farms) and each merchandises one or more strains that have differing performance attributes and market targets. Choice of strain by production companies is based upon marketing goals and the ability of the genetic properties of the birds to match feding, health and husbandry practices (Roberson et al., 2004). Independent research on growth performance and carcass component yields of tom turkeys has been reported sparsely over the past 20 yr and strains are often compared within different feeding systems or regimens (Moran et al., 1984; Warnick, 1988; Brake et al., 1995; Waldroup et al., 1997). High altitud regions are high above mean sea level. The pressure and temperature of the atmosphere at high altitude is substantially different than at sea level. At high altitude, atmospheric pressure is lower than that at sea level. The lower atmospheric pressure affects animals (including humans), due to the decrease in the partial pressure of oxygen (Peacock, 1998). The environment is very important for animal breeding. Ascites in broiler detected several decades ago at high altitudes, where broilers are hypoxic during of rapid growth (Peacock et al., 1988). Effects of high altitude on growth performance and mortality of Hybrid Turkeys have not been investigated. Objective of this study was to evaluate growth performance and mortality in Hybrid Converter turkeys reared under intensive conditions at high altitude region.

Materials and Methods

Present study was conducted in Van Province. Van is a city in Eastern Anatolia Region of Turkey. Van is located between 42^0 40´~44^0 30´ east longitudes and 37^0 43´~39^0 26´ north latitudes. City of Van at an altitude about 1725 metres above sea level. Van Province's climate is continental with severe noterworth. Winter in region is particularly long and snowy. However, summer is too short. The study was carried out in Vanet Industry and Trade Company in Van. 5040 (mixed gender) for determination of survival rate and 340 (170 per gender) Hybrid Converter poults for growth performance were utilized in the study. The birds were reared under the same husbandry conditions. Experiment was conducted in environmentally controlled barn with light, temperature, and humidity controls. Poults were maintained at 31°C at the beginning of the trial and the temperature was decreased by 2.5°C/wk. The temperature was gradually reduced to 19-20°C and relative humidity 55 % were maintained.

The lighting program consisted of 24 h of light until 3 d of age. Day length was decreased by 1 h every day and the daily dark period was increased 8 h and remained at this period of time until the

Table 1

Turkey diet formulations and feeding program

Item	Hybrid Converter		
Diet	Starter	Grower	Finisher
Weeks of age fed	0 to 4 wk	5 to 13 wk	14 to market
Calculated analysis			
Dry matter, %	89.04	88.17	87.84
Crude protein, %	26.7	22.23	16.53
Crude fibre, %	7.45	7.55	8.05
Fat, %	3.71	3.89	4.17
Crude ash,%	9.44	8.97	7.86
ME, kcal/kg	2782	3100	3200

Table 2

Means (kg), standard errors (SE) and coefficients of variation (CV %) for body weights (kg) of Hybrid Converter turkeys at different growth stages

Age, days	Female Mean±SE	Male Mean±SE	P value	CV (Female)	CV (Male)	General Mean±SE	CV (General)
7	0.148±0.001	0.158±0.001	***	8.80	8.25	0.153 ±0.001	12.05
15	0.432±0.001	0.476±0.004	***	3.02	10.96	0.454 ± 0.002	8.12
30	1.956±0.009	2.251±0.018	***	5.99	10.42	2.104 ±0.013	11.39
45	2.934±0.003	3.510±0.017	***	1.33	6.31	3.222±0.018	10.30
60	3.962±0.005	4.775±0.019	***	1.65	5.19	4.367±0.024	10.13
75	5.487±0.040	6.500±0.039	***	9.50	7.82	5.994±0.039	11.99
90	7.214±0.046	9.800±0.046	***	8.31	6.12	8.507±0.077	16.69
105	9.644±0.053	12.700±0.059	***	7.16	6.06	11.172±0.092	15.18
120	-	16.094±0.070			5.67		

*** P<0.001

end of the trial. Birds were provided free access to feed and water throughout the trial. All birds were fed the same feed. The turkeys were fed during the growth period with 3 feed variants, depending on the age of the birds. Crumbles were fed for the first phase (0 to 4 wk) and pellets were fed for the remainder of the trial. The birds were weighed individually at 15 days intervals. Mortality was recorded in birds over the whole period of trial. The experiment was terminated at 105 day of age in female and 120 day of age in male poults. Turkey diet formulations and feeding program are given in Table 1. The Independent Sample t-test was used in the determination of the differences between body weights and average daily gains for male and female poults at different growth stages. Chi-Square tes was used in the determination of the diffences between the mortalities at the different growth stages. The calculations were made using the SAS programme package (SAS, 1985).

Results and Discussion

Body weights (kg) observed during the experiment in male and female birds are presented in Table 2. The commercial line Hybrid Converter poults exhibit fast-growing traits, as was observed with the body weights of 9.644 and 12.7 kg at 105 d of age for female and male birds, respectively. Body weight of male poults was 16.094 kg at 120 d of age. The male birds were significantly heavier than the birds of the female group (P<0.001). The lowest coefficient of variation (CV) for body weight in female poults (1.33 % at 45 d of age) and male poults (5.19 % at 60 d of age) were observed. The highest CV for body weight in female poults (9.50 % at 75 d of age) and male poults (10.92 % at 15 d of age) were observed. Coefficients of variation (CV) of body weights at growth period ranged from 8.12 to 16.69 %. Live weight gains (g/day) observed during the experiment in male and female birds are set out in Table 3. The highest live weight gains were observed between 75-90 days of the experiment in male poults (220.03 g) and between 90-105 days of the experiment in female birds (162.03 g). Average daily gains of male birds during the experiment were significantly (P<0.001) heavier than the birds of the female group.

Roberson et al. (2004) reported that Hybrid Converter poults were similar to Nicholas poults and heavier than BUTA poults at 2 wk of age. The BUTA poults were lighter than Hybrid Converter

Table 3

Means (g), standard errors (SE) and coefficients of variation (CV %) for average daily gains (g/day) of Hybrid Converter turkeys

Days	Female Mean±SE	Male Mean±SE	P value	CV (Female)	CV (Male)	General Mean±SE	CV
15-30	101.62±0.662	118.33±1.001	***	8.49	11.03	109.98±0.821	13.76
30-45	65.19±0.646	83.98±0.789	***	12.92	12.25	74.59±0.664	16.41
45-60	68.55±0.479	84.32±0.776	***	9.11	11.99	76.43±0.682	16.45
60-75	101.64±0.974	114.98±1.122	***	12.49	12.72	108.31±1.170	19.91
75-90	115.11±1.102	220.03±2.241	***	12.48	13.32	167.57±2.029	22.33
90-105	162.03±1.526	193.30±1.767	***	12.27	11.91	177.67±2.264	23.49
7-105	96.89±0.542	127.97±0.599	***	7.29	6.10	112.43±1.035	16.97
7- 120	-	141.02±0.567	-	-	5.25	-	-

*** P<0.001

Table 4

Mortality in hybrid converter poults

Week	%
0-4	0.51c
5-9	0.60b
10-13	2.46a
14-17	0.68b
General	4.25

*** P<0.001

On the column: different letters are statistically significant.

and Nicholas poults at 5 wk, but were intermediate at 11 wk (lighter than Nicholas and heavier than Hybrid Converter) and were heavier than other strains at 17 and 19 wk. Nicholas birds were heavier than Hybrid turkeys at 11, 17 and 19 wk of age. Roberson et al. (2004) found that body weights for Hybrid Converter, Nicholas and BUTA male poults at 17 wk of age were 16.35, 17.46 and 18.11 kg, respectively. Body weigt reported for Hybrid Converter male poults at 17 wk of age by Roberson et al. (2004) were similar to the result of this study, however Nicholas and BUTA poults at 17 wk of age were higher the result of this study. Converter Hybrid male poults grew the fastest between 75-90 days of the trial. Converter Hybrid female poults grew the fastest between 90-105 days of the trial. Body weight (9.64 kg) obtained for Hybrid Converter female poults at 15 wk of age in this study was somewhat higher than body weigts reported for Hybrid Converter (9.44 kg), Grade Maker (8.58 kg), Hybrid EURO FP (9.14 kg) and Nicholas (8.26 kg) female poults at 15 wk of age by Turkoglu et al. (2005). Body weight (16.09 kg) obtained for Hybrid Converter male poults at 120 day of age (about 17 wk) in this study was higher than body weigts reported for Hybrid Converter (15.30 kg), Grade Maker (12.10 kg), Hybrid EURO FP (15.18 kg) and Nicholas (13.78 kg) male poults at 17 wk of age by Turkoglu et al. (2005).

Survival rate is a major factor affecting productivity of turkey. A total of 214 poults were died throughout the trial. Mortality observed for Hybrid Converter Turkeys is presented in Table 4. There were significant differences between mortalities at different growth periods (P<0.001). The average mortality for Hybrid Converter poults was 4.25 %. The highest mortality (2.46%) was observed at 10-13 wk of age, in which growth rate was also the highest, while the lowest mortality (0.51%) was observed at 0-4 wk of age, in which growth rate

was the lowest. Mortality increased with increase in growth rate. Levenick and Leighton (1989) reported that survival rates for Large White (88%) and Medium White (94%) poults at 20 wk of age. The increased growth rates can lead to mortality. Roberson et al. (2003) reported that survival rates for Hybrid Converter (81.9%), BUT (87.2%) and Nicholas (82%) poults at 16 wk of age. Roberson et al. (2004) reported that survival rates for Hybrid Converter, Nicholas and BUTA poults at 19 wk of age were 95.9, 85.5 and 89.6 %, respectively. Survival rates reported by Roberson et al. (2003), Levenick and Leighton (1989) are lower from the result (95.75%) of this study. Survival rate reported by Roberson et al. (2004) for Hibrid Converter poults was similar to the result of this study.

Conclusion

The results of the experiment that growth performance of Hybrid Converter poults reared under intensive conditions at high altitude were within commercial standards. The highest mortality was observed at 10-13 wk of age, in which growth rate was also the highest, while the lowest mortality was observed at 0-4 wk of age, in which growth rate was the lowest

References

Brake, J., G. B. Havenstein, P. R. Ferket, D. V. Rives and F. G. Giesbrecht, 1995. Relationship of sex, strain, and body weights to carcass yield and offal production in turkeys. *Poultry Science,* **74:** 161-168.

Buddiger, N. and G. Albers, 2009. Future trends in turkey breeding. Hybrid. http://www.hybridturkeys.com/Media/PDF_files/Management/Mng_future_trds_lbs.pdf.

Levenick, C. K. and A. T. Leighton, 1989. Effect of Photoperiod and filtered light on growth, reproduction and mating behavior of turkey. 1. Growth performance of two lines of males and females. *Poultry Science*, **67:** 1505-1513.

Moran, E. T., L. M. Jr Poste, P. R. Ferket and V. Agar, 1984. Response of large tom turkeys differing in growth characteristics to divergent feeding systems: Performance, carcass quality, and sensory evaluation. *Poultry Science,* **63:** 1778-1792.

Peacock, A. J., 1998. Oxygen at high altitude. *British Medical Journal,* **317:** 1063–1066.

Peacock, A. J., C. K. Pickett, K. M. Morris and J. T. Reeves, 1988. Spontaneous pulmonary hypertension in rapidly growing broiler chickens reared at sea level. *Am. Rev. Resp. Dis*, **137:** 106.

Roberson, K. D., J. L. Kalbfleisch and D. Dransfield, 2004. Comparison of growth performance and carcass component yield of a new strain of tom turkeys to other commercial strains. *International Journal of Poultry Science*, **3:** 791-795.

Roberson, K. D., A. P. Rahn, R. J. Balander, M. W. Orth, D. M. Smith, B. L. Booren, A. M. Booren, **W. N. Osburn and R. M. Fulton,** 2003. Evaluation of the growth potential, carcass componenets and meat quality characteristics of three commercial strains of Tom turkeys. *J. Appl. Poult. Re.s,* **12:** 229-236.

SAS:1985. User's guide statistics, version 5 edn., SAS Inst., Inc., Cary, NC.

Turkoglu, M., M. Sarica and H. Eleroglu, 2005. Hindi Yetistiriciligi.Form-Ofset, Samsun, Turkey.

Waldroup, P. W., J. A. England, A. L.Waldroup and N. B. Anthony, 1997. Response of two strains of Large White male turkeys to amino acid levels when diets are changed at three- or four-week intervals. *Poultry Science,* **76:** 1543-1555.

Warnick, R. E., 1988. Turkey Research Progress Report. Utah Agri. Exp. Sta. Snow Field Sta. *Res. Rep.,* 127 pp.

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