

EARLY VIEW

RESEARCH PAPER



# Determination of Performance, Slaughter Characteristics and Tonic Immobility of the Anadolu-T Broiler Genotype

Ayşe Duygu MUT<sup>1</sup>, Vahdettin SARIYEL<sup>2</sup>, Ali AYGUN<sup>1</sup>, \*

<sup>1</sup>Selçuk University, Agriculture Faculty, Department of Animal Science, Konya, Turkey

<sup>2</sup>Selçuk University, Karapınar Vocational School, Karapınar, Konya, Turkey

## Article History

Received Dec 05, 2025

Accepted: Jan 28, 2026

First Online:

## \*Corresponding Author

Tel: +0505 5470821

E-mail: aaygun@selcuk.edu.tr

## Keywords

Broiler

Anadolu-T

Body weight

Carcass ratio

Tonic immobility

## Abstract

This study investigated the body weight, feed consumption, feed conversion ratio, carcass traits, organ weights, and tonic immobility of the Anadolu-T broiler chicken genotype. A total of 66 chicks were used in the study. The Anadolu-T broiler chicks were raised in a free-range system for 42 days. As performance characteristics, body weight, body weight gain, feed consumption, feed conversion ratio, and mortality were recorded in the study. The carcass characteristics and organ weights of the animals slaughtered after 42 days were determined. Additionally, tonic immobility was measured in birds as an indicator of fear. Average body weight values on Day 1, Day 10, Day 25, and Day 42 were determined as 37.7 g, 234 g, 1064 g, and 2598 g, respectively. The average body weight gain from Day 1 to Day 42 was determined as 2560 g. The average tonic immobility value was determined as 164 sec. The average feed consumption of the Anadolu-T genotype between 1 and 42 days was determined as 4873 g. The feed conversion ratio between 1 and 42 days was determined to be 1.90. The average carcass weight ratio of the Anadolu-T broiler chicken genotype was determined to be 75%. The breast meat ratio was determined to be 34%, the back weight ratio 18.5%, the thigh weight ratio 28%, the wing weight ratio 11%, and the neck weight ratio 7.5%. The Anadolu-T broiler chicken genotype was found to have an average weight percentage of 0.98% for the heart, 2.20% for the liver, 0.47% for the spleen, 1.70% for the gizzard, and 0.63% for the pancreas.

## Introduction

Although the number of commercial companies pursuing chicken breeding activities is steadily decreasing worldwide, some genetics companies are providing support to these companies. Recent chicken diseases, wars, and terrorist attacks have disrupted trade and can also hinder the distribution of breeding stock in poultry farming. Consequently, breeding efforts at the research and production levels are beginning to revive across countries (Thiruvankadan *et al.*, 2011; Oğuzhan and Sarıca 2024). All parent stock used in chicken meat production in Turkey is imported. The number of parent stocks and, in some cases, grandparent stocks is increasing every year. Although Turkey is among the leading countries in broiler production, progress in the production of improved

breeders has not been achieved (Sarıca *et al.*, 2024). (Sarıca *et al.*, 2024). Broiler chicken development efforts in Turkey began in the 1960s and continued until the 2000s. During this period, the ATE-BRO and ERBRO, broiler genotypes were developed (Akbaş 1973; Düzgüneş 1985; Adalığ 1989). These efforts were halted around the 2000s for various reasons. TAGEM decided to restart breeding efforts in 2011, and the Anadolu-T broiler genotype was developed at the Eskişehir Transitional Zone Agricultural Research Institute (Oğuzhan and Sarıca 2024).

Even though the number of studies on the Anadolu-T genotype is limited, some studies have been conducted (Evren 2020; Erensoy 2024; Erensoy *et al.*, 2024a; Oğuzhan and Sarıca 2024).

Evren (2020) examined the performance and carcass traits of commercial Anadolu-T and Ross 308 hybrids. According to the findings, genetic differences affected body weight gain throughout the trial, with the Ross genotype achieving higher body weight gain. The differences in feed intake and death rates between the genotypes were not significant. The Ross genotype was reported to be superior in terms of feed conversion. The Ross genotype was reported to be superior in terms of 42-day slaughter weight, carcass ratio, and abdominal fat percentage. Erensoy *et al.*, (2024a) compared Anadolu-T broiler purebred lines with the Ross-308 genotype in terms of body weight and tonic immobility. They reported that the Ross-308 genotype was in better condition in terms of body weight. However, they stated that the differences between the genotypes in terms of tonic immobility were insignificant.

The majority of studies using the Anadolu-T genotype are purebred lines (Sarica *et al.*, 2021; Erensoy and Sarica 2022; Erensoy and Sarica 2023; Erensoy *et al.*, 2024a; Erensoy *et al.*, 2024b; Oğuzhan and Sarica 2024). Limited research has been done using hybrid materials. Further research with hybrid materials is clearly needed. The present study aimed to determine the Anadolu-T genotype's body weight, body weight gain, feed consumption, feed conversion ratio, carcass ratio, organ weights, and tonic immobility characteristics.

## Materials and Methods

This study was conducted at the Selçuk University, Faculty of Agriculture, Prof. Dr. Orhan Düzgüneş Livestock Research and Application Facilities. The stocking density was set at 11 chicks/m<sup>2</sup> in indoor areas. The outdoor area was set at 2 m<sup>2</sup> for each chicken. Sawdust was used as bedding material on the floor of the pens. Alfalfa plants are present in the outdoor area. Additionally, each pen was equipped with 2 nipple systems and a circular feeder with a diameter of 40 cm. In the study, the Anadolu-T broiler chicken genotype was used. One-day-old Anadolu-T broiler chicks were obtained from commercial broiler production company (Beypi Inc., Beypazarı, Bolu). A total of 6 pens were used in the study, with 11 chicks in each pen, resulting in a total of 66 broiler chickens. The nutrient values of the feed used in the treatment were as follows: starter feed for chicks aged 1-10 days (%22 crude protein (CP), 2970 Kcal/kg metabolic energy, %0.95 Ca, %0.50 available phosphorus), grower feed for chicks aged 11-24 days (%20 CP, 3050 Kcal ME/kg, %0.75 Ca, %0.42 available phosphorus), and finisher feed for chicks aged 25-42 days (%18 CP, 3100 Kcal ME/kg, %0.65 Ca, %0.35 available phosphorus). Feed and water were provided ad libitum. When the chicks were placed in the pens, the temperature was set at 33 °C at chick level using automatic electric heaters. The pens temperature was reduced by 3 °C each week until it reached 21 °C. For the lighting program, 24 hours of light was provided on

the first day. On the second and third days, there were 23 hours of light and 1 hour of darkness. After that, it was adjusted to 16 hours of light and 8 hours of darkness until the end of the treatment (Bayram and Özkan 2010). The body weights of the chicks were recorded at the beginning of the treatment, on the 10<sup>th</sup> day, 15<sup>th</sup> day, 25<sup>th</sup> day, and 42<sup>nd</sup> day on a subgroup basis. Similarly, feed consumption was determined by determining the remaining feed on a subgroup basis on days 10, 15, 25, and 42. Feed conversion ratio (g feed/g CAA) was calculated from body weight gain and feed consumption. During the treatment, deaths were monitored daily, and as they occurred, they were recorded. At the end of the treatment (Day 42), a total of 16 chickens were slaughtered to determine the hot carcass weight and the weights of the carcass parts. The organ weight ratio was calculated by dividing by body weight. Prior to slaughter, the animals were fasted for 12 hours. At the end of the rearing period, tonic immobility was measured in three chickens randomly selected from each poultry house. In the tonic immobility test, the animal was placed on its back or on its right side in a cradle-like device with its head down.

The animal was held lightly by the chest for 10 seconds before being released. The time was recorded by the measuring officer, standing 1 m away from the animal. If the animal stood up within 10 seconds and this number was repeated three times, the tonic immobility score was recorded as "0." The test period was limited to a maximum of 5 minutes, and for animals that did not stand up at the end of this period, the tonic immobility period was considered to be 300 seconds. The test was evaluated based on the time the animal remained immobile (Jones and Faure 1980; Mahboub *et al.*, 2004)

## Statistical analysis

The descriptive statistics of the obtained data were calculated using Minitab 16 software. The statistical results are summarized in the tables. The descriptive statistics provided include the mean value, standard error, coefficient of variation, minimum, and maximum values.

## Results and Discussion

### Body weight, body weight gain and tonic immobility

Descriptive statistics regarding body weight, body weight gain, and tonic immobility for the Anadolu-T broiler genotype are given in Table 1. Average body weight values on Day 1, Day 10, Day 25, and Day 42 were determined as 37.7 g, 234 g, 1064 g, and 2598 g, respectively. The minimum body weight on Day 42 was determined as 2515 g and the maximum body weight as 2720 g. The average body weight gain from Day 1 to Day 42 was determined as 2560 g. The average tonic immobility value was determined as 164 sec. Our study found that the body weight of the Anadolu-T broiler

chicken genotype on Day 42 (2598 g) is higher than the 2172 g reported by Evren (2020) in their study. On the other hand, in a study conducted with the Anadolu-T broiler chicken genotype (Sarica *et al.*, 2024), the body weight on Day 42 was found to be 2773 g, which is higher than the value obtained in our study (2598 g). Ayaşan and Okan (2014) found the body weight of Ross 308 broilers to be 1747 g in their study, which is lower than the body weight of the Anadolu-T broiler from our study (2598 g). Wang *et al.*, (2015) documented a body weight of 2701 g for Arbor Acres broilers on Day 42, surpassing the Anadolu-T broiler chicken body weight recorded in our study (2598 g).

Body weight and weight gain are essential performance characteristics and are preferred to be increased. It is affected by many factors, including genetic breeding, incubation conditions, nutrition, rearing practices, and slaughter age (Feddes *et al.*, 2002; Abdallah *et al.*, 2024).

The average tonic immobility value of the Anatolian-T broiler genotype was determined to be 164 s. According to Lanier (2008), fear is an important component of stress. The tonic immobility test is an important method for assessing fear levels used to determine this condition in poultry. The slowing down of the response of the animal's sympathetic nervous system due to fear, and behaviours such as partial paralysis and lack of response to environmental events, are thought to be a result of tonic immobility (Jones 1986). Chickens with a longer tonic immobility period are considered more fearful and passive than other chickens (Jones and Faure 1980; Taşkın *et al.*, 2015; Hoş and Özkan 2023). Erensoy *et al.*, (2024a) found the tonic immobility value of male chickens as 262 s and of female chickens as 145 s in their study on broiler chickens. On the other hand, Yenilmez *et al.*, (2025) determined the tonic immobility value as 179 s in the Ross 308 genotype. The difference in tonic immobility values obtained in our study may be due to the fact that the duration of tonic immobility is affected by many factors. These factors incorporate lighting, pre-slaughter capture, age, the supplementation of specific substances to the feed, and stocking density (Brake *et al.*, 1994; Zulkifli *et al.*, 1998; Zulkifli *et al.*, 2000; Onbaşılar *et al.*, 2007; Anderson *et al.*, 2021; Gallard *et al.*, 2022; Sayin *et al.*, 2022; Tiemann *et al.*, 2023).

Only two deaths occurred during the rearing period, indicating a 3% mortality rate for the study. Torrey *et al.*, (2021) determined the mortality rate to range from 1.52% to 4.36% in their studies including various broiler genotypes, consistent with the mortality rate observed in our study.

#### **Feed consumption and feed conversion ratio**

Descriptive statistics regarding feed consumption and the feed conversion ratio for the Anadolu-T broiler genotype are given in Table 2. The average feed

consumption of the Anadolu-T genotype between 1 and 10 days was determined as 249 g, the average feed consumption between 11 and 25 days was determined as 1720 g, the average feed consumption between 26 and 42 days was determined as 2904 g and the average feed consumption between 1 and 42 days was determined as 4873 g. The feed conversion ratio between 1 and 42 days was determined to be 1.90. The amount of feed consumed (4873 g) throughout the 42-day period was found to be more than the amount consumed (4638 g) in the study by Saber *et al.*, (2020) using the Ross 308 genotype. Kurşun *et al.*, (2022) found that the 42-day feed consumption for the Ross 308 genotype was 3628 g, which is lower than the 4873 g recorded in our study. In the study by Altop *et al.*, (2021) using the Ross 308 genotype, it was noted that the feed consumption (4454 g) was lower to that observed in our research. The feed conversion ratio derived from our study was 1.90, whereas the ratios reported in broiler studies ranged from 1.51 to 1.85 (Saber *et al.*, 2020; Altop *et al.*, 2021; Kurşun *et al.*, 2022), indicating better results compared to our findings.

#### **Carcass characteristics**

Table 3 presents the descriptive statistics for the carcass weights of the Anadolu-T broiler chicken genotype at the end of the treatment (Day 42). The mean carcass weight of the Anadolu-T broiler chicken genotype was established at 1902 g. The average carcass weight percentage of the Anadolu-T broiler chicken genotype was established at 75%. The minimum carcass percentage was recorded at 72%, while the maximum was noted at 78%. The breast meat constituted 34% of the total body weight, the back 18.5%, the thigh 28%, the wing 11%, and the neck 7.5%. Sevim and Cufadar (2017) reported a carcass weight of 2711 g for Ross 308 broilers, which is higher than the carcass weight of 1902 g for Anadolu-T broiler chickens identified in our study. Conversely, Saber *et al.*, (2020) reported a carcass weight of 1886 g for the Ross 308 genotype, which is comparable to the 1902 g carcass weight observed in the study we conducted. Ayaşan and Okan (2014) documented the carcass weight percentage of Ross 308 broilers at 74%, which is inferior to the carcass weight percentage of the Anadolu-T broiler chicken observed in our study (75%). Correspondingly, the same researchers determined the thigh weight percentage of the Ross 308 broiler genotype to be 22%, which is inferior to the result recorded in our study (28%). Wang *et al.*, (2015) documented a carcass weight percentage of 75% for Arbor Acres broilers in their research. The Anadolu-T broiler chicken from our study had a comparable carcass percentage of 75%.

The difference between the values obtained from our study and those obtained from other studies has been stated by many researchers: carcass characteristics are affected by many factors such as the breeder age, feeding, incubation conditions, slaughter

age, and body weight (Brake *et al.*, 1993; Coskun *et al.*, 2018; Saber *et al.*, 2020; Kurşun *et al.*, 2022; Benahmed *et al.*, 2023).

### Organ weights

Table 4 displays the descriptive statistics for the organ weight percentages of the Anadolu-T broiler chicken genotype on Day 42. The Anadolu-T broiler chicken genotype was found to have an average weight percentage of 0.98% for the heart, 2.20% for the liver, 0.47% for the spleen, 1.70% for the gizzard, and 0.63% for the pancreas.

In comparison to the liver weight percentage of the Anadolu-T broiler chicken obtained in our investigation (2.20%), Wu *et al.*, (2018) observed that the liver weight percentage of Arbor Acres broilers was 3.5%. On the other hand, the same researchers reported the pancreas weight percentage as 0.29%, the spleen weight percentage as 0.12%, and the gizzard weight percentage as 1.05%. These results are lower than those observed in our study. Wang *et al.*, (2015) reported the gizzard weight percentage of Arbor Acres broilers as 0.71%, which is lower than the gizzard weight percentage of the Anadolu-T broiler chicken obtained in our study (1.70%).

### Conclusion

This study assessed the performance, carcass characteristics, and tonic immobility of the Anadolu-T broiler genotype generated domestically. The Anadolu-T broiler genotype seems to be underperforming in body weight, body weight gain, feed intake, and feed conversion ratio. Enhancing the Anadolu-T genotype should be prioritized in this context. The Anadolu-T genotype exhibits similarities to other genotypes regarding carcass characteristics, tonic immobility, and mortality rates. The scarcity of studies on the Anadolu-T demands additional research. Moreover, it is essential to conduct experiments that compare Anadolu-T with other broiler genotypes under similar circumstances.

### Author Contributions

Conceptualization, A.D.M. and A.A.; methodology, A.D.M. and A.A.; validation, A.D.M. and A.A.; formal analysis, A.D.M., and A.A.; investigation, A.D.M. and A.A.; data curation, A.D.M., A.A.; writing-original draft preparation, A.D.M., V.S., and A.A.; writing-review and editing, A.D.M., V.S., A.A.; supervision, A.A.; project administration, A.A.; funding acquisition, A.A. All authors have read and agreed to the published version of the manuscript.

### Conflict of Interest

The authors declare no conflicts of interest.

### Acknowledgements

This study was supported by S.Ü. BAP (24402006) and TUBITAK 2209-A project (1919B012334601).

### References

- Abdallah, N., Kurşun, K., Baylan, M. (2024). Thermal Acclimation During Embryogenesis; Effect on Pre and Post Hatch Performance of Commercial Broiler Chickens; a Review. *BIO Web of Conferences*,
- Adalığ, H. 1989. Erbro Etlik Piliç Ana-Baba Soylarının Seleksiyonla ıslahı Ve Yeni Soylar Geliştirme Projesi. 1989 Yılı Gelişme Raporu. Erbeyli, Aydın.
- Akbay, R. (1973). Kasaplık Piliç Yetiştiriciliğinde Cornish X Leghorn Melezlerinden Faydalanma İmkanları Üzerinde Araştırmalar. AÜ Ziraat Fakültesi.
- Altop, A., Coskun, I., Filik, A. G., Cayan, H., Sahin, A., Gungor, E., Erener, G. 2021. Dietary Supplementation of *Agaricus Bisporus* Stalk Meal on Growth Performance, Carcass and Organ Traits, Meat Quality, Cecum Mesophilic Aerobic Bacteria Counts and Intestinal Histology in Broiler Chickens. *Ciencia Rural*, 52(6): e20201051.
- Anderson, M. G., Campbell, A. M., Crump, A., Arnott, G., Newberry, R. C., Jacobs, L. 2021. Effect of Environmental Complexity and Stocking Density on Fear and Anxiety in Broiler Chickens. *Animals*, 11(8): 2383.
- Ayaşan, T., Okan, F. 2014. Dişi Etlik Piliçlerde Treonine Özgü Yem Seçiminin Performans Ölçütleri ve Karkas Özelliklerine Etkisi. *KSÜ Doğa Bilimleri Dergisi*, 17(2): 1-9.
- Bayram, A., Özkan, S. 2010. Effects of a 16-Hour Light, 8-Hour Dark Lighting Schedule on Behavioral Traits and Performance in Male Broiler Chickens. *Journal of Applied Poultry Research*, 19(3): 263-273.
- Benahmed, S., Askri, A., de Rauglaudre, T., Létourneau-Montminy, M.-P., Alnahhas, N. 2023. Effect of Reduced Crude Protein Diets Supplemented with Free Limiting Amino Acids on Body Weight, Carcass Yield, and Breast Meat Quality in Broiler Chickens. *Poultry science*, 102(11): 103041.
- Brake, J., Havenstein, G. B., Scheideler, S. E., Ferket, P. R., Rives, D. V. 1993. Relationship of Sex, Age, and Body Weight to Broiler Carcass Yield and Offal Production. *Poultry science*, 72(6): 1137-1145.
- Brake, J., Keeley, T. P., Jones, R. B. 1994. Effect of Age and Presence of Perches During Rearing on Tonic Immobility Fear Reactions of Broiler Breeder Pullets. *Poultry science*, 73(9): 1470-1474.
- Coskun, I., Akkan, A., Erener, G. 2018. Effects of in Ovo Injection of Lysine and Methionine into Fertile Broiler (Parent Stock) Eggs on Hatchability, Growth Performance, Caecum Microbiota, and Ileum Histomorphology. *Revista Brasileira de Zootecnia*, 47: e20170220.
- Düzgüneş, O. 1985. Memleketimizde Hibrit Ebeveyn Soyları Geliştirme Çalışmaları. *Ulusal Tavukçuluk Sempozyumu*, 85: 66-73.
- Erensoy, K. 2024. Genetik Olarak Farklı Anadolu-T Etlik Piliç Saf Hatları Ve Hibritlerde Büyüme, Refah ve Bacak Sağlamlığı Özellikleri. *Journal of Animal Production*, 65(2): 149-160.

- Erensoy, K., Sarıca, M. 2022. Fast Growing Broiler Production from Genetically Different Pure Lines in Turkey. 1. Parental Traits: Growth, Feed Intake, Reproduction, and Hatching Traits. *Tropical Animal Health and Production*, 54(5): 322.
- Erensoy, K., Sarıca, M. 2023. Fast Growing Broiler Production from Genetically Different Pure Lines in Turkey. 2. Broiler Traits: Growth, Feed Intake, Feed Efficiency, Livability, Body Defects and Some Heterotic Effects. *Tropical Animal Health and Production*, 55(1): 61.
- Erensoy, K., Sarıca, M., Çavdarıcı, H., Aslan, R., Boz, M. A. (2024a). Etlik Piliçlerde Genotipin Tonik İmmobilite ve Yürüme Kabiliyeti Üzerine Etkisi. *International Anatolian Agriculture, Food, Environment and Biology Congress*,
- Erensoy, K., Sarıca, M., Karaçay, N. 2024b. Effect of Genotype and Holding Duration on Some Post-Hatch Traits of Day-Old Broiler Pure Line Chicks. *Black Sea Journal of Agriculture*, 7(1): 22-28.
- Evren, Ş. (2020). Anadolu-T ve Ross 308 Etlik Cıvıv Hibritlerinin Besi Performansı ve Karkas Özellikleri Üzerine Ön-Başlatma Yemi Uygulamasının Etkileri Çukurova Üniversitesi]. Adana, Türkiye.
- Feddes, J. J., Emmanuel, E. J., Zuidhof, M. J. 2002. Broiler Performance, Body Weight Variance, Feed and Water Intake, and Carcass Quality at Different Stocking Densities. *Poultry science*, 81(6): 774-779.
- Gallard, E., Menichelli, M., Di Masso, R., Revidatti, F. 2022. Stocking Density, Sex and Season on Tonic Immobility in Broiler Chickens. *MVZ Córdoba*, 27(2): e2151.
- Hoş, A. E., Özkan, S. (2023). Farklı Gelişme Hızına Sahip Etlik Piliç Genotiplerinde Korku Yanıtı. 6. Uluslararası Beyaz Et Kongresi, Antalya.
- Jones, R., Faure, J. 1980. Tonic Immobility (Righting Time) in the Domestic Fowl: Effects of Various Methods of Induction. *IRSC Med Sci*, 8: 184-185.
- Jones, R. B. 1986. The Tonic Immobility Reaction of the Domestic Fowl: A Review. *World's Poultry Science Journal*, 42(1): 82-96.
- Kurşun, K., Durmuş, M., Baylan, M. 2022. The Effect of Breeding Flock Age on Fattening Performance and Carcass Characteristics in Broiler. *Turkish Journal of Agriculture-Food Science and Technology*, 10(11): 2096-2101.
- Lanier, J. L. 2008. Stress, Fear, and Standard Livestock Husbandry Procedures. *REDVET. Revista Electrónica de Veterinaria*, 9(10B): 1-12.
- Mahboub, H., Müller, J., Von Borell, E. 2004. Outdoor Use, Tonic Immobility, Heterophil/Lymphocyte Ratio and Feather Condition in Free-Range Laying Hens of Different Genotype. *British Poultry Science*, 45(6): 738-744.
- Oğuzhan, E., Sarıca, M. 2024. Anadolu-T Etlik Piliç Ebeveyn Hattının Elde Edilmesinde Kullanılan Saf Hatların Canlı Ağırlık ve Yumurta Verim Değişimleri. *Turkish Journal of Agriculture-Food Science and Technology*, 12(9): 1539-1547.
- Onbaşlar, E. E., Erol, H., Cantekin, Z., Kaya, Ü. 2007. Influence of Intermittent Lighting on Broiler Performance, Incidence of Tibial Dyschondroplasia, Tonic Immobility, Some Blood Parameters and Antibody Production. *Asian-Australasian Journal of Animal Sciences*, 20(4): 550-555.
- Saber, S., Kutlu, H., Uzun, Y., Celik, L., Yucelt, O., Baylan, M. 2020. Effects of Form of Dietary Trace Mineral Premix on Fertility and Hatchability of Broiler Breeder Hens and Post-Hatch Performance and Carcass Parameters of Their Progenies. *Kafkas Üniversitesi Veteriner Fakültesi Dergisi*, 26(2): 171-180.
- Sarıca, M., Erensoy, K., Özkan, İ., Oğuzhan, E., Çağlak, S. 2021. Growth and Carcass Traits of Anadolu-T Broiler Pure Lines. *Turkish Journal of Agriculture-Food Science and Technology*, 9(11): 1980-1987.
- Sarıca, M., Mesut Türkoğlu, Yamak, U. S. (2024). Tavukçuluktaki Gelişmeler, Dünya Ve Türkiye. In Musa Sarıca Mesut Türkoğlu (Eds.), *Tavukçuluk Bilimi, Yetiştirme, Besleme, Hastalıklar* (pp. 1-30).
- Sayın, Y., Kaplan, O., Karaduman, E., Haqqar, D. M., Nariç, D. 2022. The Effect of Monochromatic, Combined, and Mixed Light-Emitting Diode Light Regimes on Growth Traits, Fear Responses, and Slaughter-Carcass Characteristics in Broiler Chickens. *Tropical Animal Health and Production*, 54(5): 277.
- Sevim, B., Cufadar, Y. 2017. Etlik Piliçlerde Karma Yeme Farklı Esansiyel Yağlar ve Karışımlarının İlavasının Performans ve Karkas Özellikleri Üzerine Etkisi. *Turkish Journal of Agriculture-Food Science and Technology*, 5(8): 964-968.
- Taşkın, A., Şahin, A., Camcı, Ö., Erener, G. 2015. Kanatlılarda Anti-Stres Uygulamalarında Yeni Yaklaşımlar. *Turkish Journal of Agriculture-Food Science and Technology*, 3(7): 571-576.
- Thiruvankadan, A., Prabakaran, R., Panneerselvam, S. 2011. Broiler Breeding Strategies over the Decades: An Overview. *World's Poultry Science Journal*, 67(2): 309-336.
- Tiemann, I., Becker, S., Fournier, J., Damiran, D., Büscher, W., Hillemecher, S. 2023. Differences among Domestic Chicken Breeds in Tonic Immobility Responses as a Measure of Fearfulness. *PeerJ*, 11: e14703.
- Torrey, S., Mohammadigheisar, M., Nascimento dos Santos, M., Rothschild, D., Dawson, L. C., Liu, Z., Kiarie, E. G., Edwards, A. M., Mandell, I., Karrow, N., Tulpan, D., Widowski, T. M. 2021. In Pursuit of a Better Broiler: Growth, Efficiency, and Mortality of 16 Strains of Broiler Chickens. *Poultry science*, 100(3): 100955.
- Wang, Y., Ru, Y., Liu, G., Chang, W., Zhang, S., Yan, H., Zheng, A., Lou, R., Liu, Z., Cai, H. 2015. Effects of Different Rearing Systems on Growth Performance, Nutrients Digestibility, Digestive Organ Weight, Carcass Traits, and Energy Utilization in Male Broiler Chickens. *Livestock Science*, 176: 135-140.
- Wu, Q. J., Zheng, X. C., Wang, T., Zhang, T. Y. 2018. Effects of Dietary Supplementation with Oridonin on the Growth Performance, Relative Organ Weight, Lymphocyte Proliferation, and Cytokine Concentration in Broiler Chickens. *Bmc Veterinary Research*, 14(1): 34.
- Yenilmez, E., Abdallah, N., Baylan, M., Kursun, K. 2025. The Effect of Environmental Enrichment on Behavior, Fear, Stress, Lameness, Bone, and Litter Quality in Broiler Chickens. *Journal of Applied Animal Welfare Science*: 1-13.
- Zulkifli, I., Che Norma, M., Chong, C., Loh, T. 2000. Heterophil to Lymphocyte Ratio and Tonic Immobility Reactions to Preslaughter Handling in Broiler Chickens Treated with Ascorbic Acid. *Poultry science*, 79(3): 402-406.
- Zulkifli, I., Rasedee, A., Syaadoh, O., Norma, M. 1998. Daylength Effects on Stress and Fear Responses in Broiler Chickens. *Asian-Australasian Journal of Animal Sciences*, 11(6): 751-754.

**Table 1.** Descriptive statistics for the body weight and tonic immobility of the Anadolu-T broiler chicken genotype

Traits	Mean	Minimum	Maximum	Standard error	Coefficient of Variation
BW, D1 (g)	37.71	36.64	38.55	0.340	2.21
BW, D10 (g)	234	220	248	4.76	4.96
BW, D25 (g)	1064	991	1125	24.4	5.62
BW, D42 (g)	2598	2515	2720	28.9	2.73
BWG, 1-42 (g)	2560	2478	2682	28.6	2.74
TI (sec)	164	24	300	24.5	63.4

BW: Body weight, D: Day, BWG: Body weight gain, TI: Tonic immobility

**Table 2.** Descriptive statistics for the feed consumption and feed conversion ratio of the Anadolu-T broiler chicken genotype

Traits	Mean	Minimum	Maximum	Standard error	Coefficient of Variation
FC, 1-10 day (g)	249	232	263	4.19	4.12
FC, 11-25 day (g)	1720	1662	1818	22.4	3.19
FC, 26-42 day (g)	2904	2830	2992	22.3	1.88
FC, 1-42 day (g)	4873	4793	5063	40.2	2.02
FCR, 1-42 day	1.90	1.89	1.94	0.008	1.01

FC: Feed consumption, FCR: Feed conversion ratio.

**Table 3.** Descriptive statistics for the carcass characteristics of the Anadolu-T broiler chicken genotype

Traits	Mean	Minimum	Maximum	Standard error	Coefficient of Variation
Carcass weight (g)	1902	1597	2050	42.4	8.92
Carcass ratio (%)	75	72	78	0.42	2.22
Breast ratio (%)	34.18	30.96	36.36	0.365	4.27
Back ratio (%)	18.52	16.05	20.35	0.252	5.45
Thigh ratio (%)	28.21	26.30	30.23	0.321	4.55
Wing ratio (%)	11.39	10.04	13.16	0.235	8.23
Neck ratio (%)	7.49	6.44	9.25	0.181	9.66

**Table 4.** Descriptive statistics for the organ weight ratio (%) of the Anadolu-T broiler chicken genotype

Traits	Mean	Minimum	Maximum	Standard error	Coefficient of Variation
Heart (%)	0.98	0.86	1.23	0.02	9.56
Liver (%)	2.20	1.97	2.57	0.05	8.16
Spleen (%)	0.47	0.41	0.58	0.01	9.65
Gizzard (%)	1.70	1.50	1.96	0.04	8.34
Pancreas (%)	0.63	0.58	0.73	0.01	6.60