CURRENT VETERINARY SCIENCE

Curr Vet Sci, 2(1): 19-21, 2025

Current Veterinary Science

Review Article

Common Errors in Breeding Management and Incubation Practices of Geese Raised by Local Geese Farmers

Selda Karadağ[1]

[1] Veterinary Medicine, Independent Researcher, Kars, Türkiye

ABSTRACT

This review was written to identify common errors encountered in breeder selection and incubation management in geese raised under local farming conditions. Goose farming is a low-cost and high-return form of animal production, particularly prevalent in rural areas. In these regions, goose farming is mostly based on traditional methods. This reliance on traditional practices and a lack of knowledge often leads to poor incubation outcomes and negatively affects overall productivity. Notable issues include the insufficient consideration of genetic structure, age, body condition, and sex ratio during breeder selection. During the incubation period, mistakes are frequently observed in the collection, storage, and turning of eggs, as well as in maintaining appropriate temperature and humidity levels. This review is based on direct field observations. In light of these observations, it is recommended that training activities aimed at raising awareness among farmers be increased to reduce the problems local goose farmers face. Furthermore, farmers should be encouraged to adopt incubator use instead of traditional practices and natural incubation methods, and necessary equipment support should be provided.

Keywords: Breeder selection, Goose farming, Incubation errors, Traditional practices

INTRODUCTION

When examining the goose population in Türkiye, the Eastern Anatolia Region ranks first at the regional level. Within this region, the provinces of Kars, Ardahan, and Muş account for approximately 55% of the country's total goose population (1). The geographical structure, climate, and cultural characteristics of Eastern Anatolia strongly support goose farming. In addition to the vast pasture and meadow areas, the presence of water resources such as streams and the region's cold climate make goose farming particularly advantageous in this area (2, 3). In the regional ranking, the Central Anatolia Region comes second due to the goose population in provinces such as Yozgat, Konya, Ankara, and Çankırı. The Southeastern Anatolia Region ranks third, followed by the Black Sea Region in fourth place (1).

In some countries today, goose farming is carried out at a highly significant economic scale, whereas in Türkiye, commercial-level goose production has not yet been established. The main reason for this is a narrowly regional culture of goose meat consumption that has persisted in Türkiye until recent years. Historically, goose farming in Türkiye has been practiced at a regional level and within small family farms, primarily using local goose genotypes. The characteristics of these indigenous geese raised in Türkiye have not yet been fully identified or documented (4, 5).

The aim of this review is to examine the common husbandry errors encountered in breeder management and incubation practices in goose flocks raised by local farmers, based on existing literature, and to reveal the impacts of these errors on production performance. This study serves as a guide to help local producers identify and avoid frequent mistakes while offering practical solutions to address these issues. Additionally, it aims to highlight the lack of education and technical support, to contribute to the sustainability of goose farming.

ERRORS IN BREEDER MANAGEMENT

In recent years, the increasing introduction of foreign goose genotypes in Türkiye and their uncontrolled crossbreeding with local breeds have led to significant problems in goose farming. This situation has particularly resulted in the disruption of genetic homogeneity, inconsistencies in performance traits, and difficulties in flock management. Some farms raise multiple foreign-origin goose genotypes within a single mixed flock to obtain higher egg and gosling yields from breeders, which leads to unplanned crossbreeding. However, production with a single genotype is much more appropriate in maintaining reliable performance monitoring and ensuring more accurate intra-flock control and comparisons. One of the most fundamental mistakes made by farmers across the country is the random crossbreeding of foreign genotypes with

***Corresponding Author:** selda.krdg36@gmail.com

Submitted: 23.05.2025, **Accepted:** 19.06.2025, **Published online:** 30.06.2025

How to cite this article: Karadağ S: Common Errors in Breeding Management and Incubation Practices of Geese Raised by Local Geese Farmers. Curr Vet Sci, 2(1):19–21, 2025.

each other or local geese. Therefore, guiding producers toward using a single genotype is crucial for preserving genetic integrity and enhancing production efficiency (6, 7).

Breeder management is one of the most critical factors affecting productivity and flock quality in poultry farming. In goose production, factors such as breeder selection, age, nutrition, housing, and maintaining an appropriate sex ratio play a decisive role in egg production and incubation characteristics (6, 8). However, field observations and producer experiences indicate that various errors in breeder management are quite common.

The body condition of breeder individuals is of great importance in production performance. Selecting individuals who are either excessively thin or overweight can negatively affect reproductive performance and lead to reduced fertility rates (8). In goose farming, determining an appropriate sex ratio is crucial for effective flock management. In particular, an incorrect ratio between male and female breeders can directly impact fertility rates. The generally recommended male-to-female ratio is 1:3–4 or 1:5–6 (8). However, in field practices, failure to adhere to this ratio or the absence of a sufficient number of healthy males in the flock often increases the number of unfertilized eggs, thus causing production losses. Additionally, an excessive number of female individuals and the use of inexperienced male geese can also lead to a decline in productivity (6).

Breeder age in poultry is an essential factor affecting egg production and fertility. Using very young or old individuals negatively impacts fertility rates and egg yield. Selecting healthy and reproductively active individuals within the optimal production age is crucial for sustainable production success (9). Nutrition of breeding geese directly influences reproductive performance and health, with deficiencies in energy, protein, calcium, and vitamins adversely affecting egg production and fertility. A balanced feeding program appropriate to age, physiological condition, and season is essential for sustainable and efficient farming (10, 11).

ERRORS MADE BEFORE INCUBATION PROCEDURES

One of the most critical factors affecting incubation performance is the accuracy of the procedures carried out before the incubation process begins. Mistakes at this stage can negatively impact embryonic development, reducing fertility rates and lowering hatchability. In particular, failure to collect fertile eggs under appropriate conditions and neglecting temperature, humidity, and hygiene requirements during transportation and storage increase embryo losses. Therefore, thoroughly implementing hygienic and technical measures to preserve egg quality before starting incubation procedures is a fundamental requirement for a successful incubation process (6, 8, 10).

Timely collection and proper storage of hatching eggs are critical for embryonic development and incubation success. Delayed collection increases the risk of contamination and microbial infection (12, 13, 14), while high temperatures and prolonged storage negatively affect embryo viability. Therefore, it is recommended that eggs be stored at 15–18°C with 55–65% relative humidity. The storage period should not exceed 7–10 days (6, 8).

Washing hatching eggs damages the protective cuticle layer on the eggshell surface, increasing the risk of microbial contamination and adversely affecting embryo health. Using chemical cleaning agents or hot water can increase shell permeability, creating an unsuitable gas exchange environment for the embryo (12, 15). Therefore, dirty eggs should be gently wiped or lightly cleaned with a dry cloth or soft brush. Eggs from breeder flocks should be collected several times a day. Infrequent egg collection can accelerate broodiness in females, reducing egg production and increasing the number of dirty and cracked eggs in the flock (13).

ERRORS MADE DURING INCUBATION PROCEDURES

Accurate adjustment of environmental parameters during the artificial incubation process is crucial for healthy embryo development and high hatchability rates. One of the most common errors encountered in this process is improperly regulating temperature and humidity levels. The optimal incubation temperature for goose eggs during development is 37.8°C, at which the best embryonic growth is achieved (16). The humidity inside the incubator is reported to need to be between 65-75% (8, 17, 18, 19) and increased to 80% during the hatching period. An 80% humidity level during hatching helps the eggshell to crack. Relative humidity inside the machine, either too low or too high, negatively affects incubation outcomes. Environmental conditions outside these ranges can slow embryo development, cause deformities, and lead to embryonic mortality (20, 21, 22).

Failure to turn the eggs at regular intervals or insufficient turning frequency can cause the embryo to adhere to the membranes and eggshell surface, leading to circulatory disorders and hatching difficulties (8, 23). On the other hand, inadequate ventilation results in carbon dioxide accumulation and oxygen deficiency in the incubation environment, negatively affecting embryo development. Considering all these factors, careful control of fundamental environmental parameters such as temperature, humidity, turning, and ventilation in artificial incubation systems is essential to achieve a successful hatching (24).

Unlike many commonly raised poultry species, goose eggs undergo cooling and spraying treatments during certain periods of the incubation process. The cooling and spraying procedures begin on the 5th day of incubation. Initially, the cooling is applied for about 5 minutes daily, but this duration gradually increases, and from the 15th day onward, it is applied for 30 to 35 minutes. If the cooling process is not performed adequately, hatchability rates can decrease by up to 20% (8).

Goose breeding in Türkiye has not yet reached the desired levels compared to leading countries worldwide. Although goose breeding is carried out in almost every province, its development has some obstacles. One of the most critical problems is that the goose meat market is limited only to the regions where production occurs and is not sufficiently promoted. Another issue is that goose breeding is mainly conducted in small, low-capacity family farms, and commercial enterprises are lacking. To establish commercial enterprises, there is a need for farms engaged in breeding stock production and incubation facilities that can increase the number of animals. The slaughtering conditions in small farms are inadequate. The slaughterhouse problem for small enterprises must be resolved. Additionally, large enterprises need support to establish incubation facilities, slaughterhouses, and cold storage warehouses (25).

CONCLUSION

Although Türkiye is among the countries with high potential for goose breeding, modern and commercial breeding has not yet been carried out. The production, primarily carried out in rural areas by local farmers using traditional methods, limits productivity and hinders sectoral development. Effective training programs for producers and increased government support are of great importance for the improvement and economic efficiency of goose breeding. Resolving the problems faced by breeders is necessary for the sustainability of the sector. Additionally, comprehensive and widespread training programs are essential to minimize errors during the breeding process.

DECLARATIONS

Availability of Data and Materials: The data that support the findings of this study are available on request from the corresponding author.

Funding Support: There is no any funding support.

Competing Interests: The authors declare that there is no competing of interest regarding the publication of this article.

Declaration of Generative Artificial Intelligence: The authors of the current study declare that the article and/or tables and figures were not written/created by AI and AI-assisted technologies.

Authors' Contributions: SK contributed to this present work: SK designed, drafted, read and approved the final manuscript.

REFERENCES

1. TÜİK (2024): Türkiye İstatistik Kurumu http://www.tuik.gov.tr. Hayvansal Üretim İstatistikleri. Erişim Tarihi: 20.05.2025.
2. Kırmızıbayrak T, Önk K, Yazıcı K: Kars ilinde serbest çiftlik koşullarında yetiştirilmiş yerli ırk kazların kesim ve karkas özellikleri üzerine yaş ve cinsiyetin etkisi. Kafkas Univ Vet Fak Derg, 17(1): 41-45, 2011. DOI:10.9775/kvfd.2010.2375
3. Demir P, Kırmızıbayrak T, Yazıcı K: Socio-economic importance of goose breeding. Ankara Univ Vet Fak Derg, 60(2): 129-34, 2013. DOI: 10.1501/Vetfak_0000002566
4. Tilki M, Saatcı M: Dünyada ve Türkiye'de kaz yetiştiriciliği. Turk Klin J Reprod Artif Insemin-Spec Top, 2(1): 7-14, 2016.
5. Önk K, Kırmızıbayrak T: Kars ili yetiştirici koşullarındaki kazların (Anser anser) yumurta verimi, kuluçka, büyüme, kesim ve karkas özellikleri (I. yumurta verimi ve kuluçka özellikleri). Turk J Agric Food Sci Technol, 7(3): 543-549, 2019. DOI: 0000-0002-5618-2988
6. Karadağ S: Egg Production and Characteristics and Hatching Characteristics of Gray Hungarian Geese and Mast Geese Crossbreeds in a Family Farm in Kars Province, Kafkas University, Institute of Health Sciences, Department of Zootechnics, PhD Thesis, Kars, 2023.
7. Kırmızıbayrak T, Karadağ S, Kuru BB: Slaughter and carcass traits of Gray Hungarian and German Mast Geese. Van Vet J, 35(1): 64-69, 2024. DOI: 10.36483/vanvetj.1386149
8. Salamon A: Fertility and hatchability in goose eggs: a review. İnt J Poult Sci, 19(2): 51-65, 2020. DOI: 10.3923/ijps.2020.51.65
9. Drzazga BB, Banaszewska D, Charuta A, Koncerewicz A: Influence of age on egg characteristics and reproduction features of Coluda White Geese. Europ Poult Sci, 80(142), 2016. DOI:10.1399/eps.2016.142
10. Kingori A: Review of the factors that influence egg fertility and hatchability in poultry. Int J Poult Sci, 10(6): 483-492, 2011.
11. Ogbu O, Oguike M: Hatchability of fertilite egg in poultry industry. J Agric Sustain, 12(1): 107-123, 2018.
12. Eroglu M, Erisir Z, Simsek UG, Mutlu S I, Baykalir Y, Gungoren A, Adiyaman G: Effects of washing dirty eggs of geese with boric acid and vinegar on hatchability and microbial loads. J Anim Plant Sci, 35(2): 354-363, 2025. DOI:10.36899/JAPS.2025.2.0029
13. Wales A, Davies R: Review of hatchery transmission of bacteria with focus on Salmonella, chick pathogens and antimicrobial resistance. World's Poult Sci J, 76(3): 517-536, 2020. DOI: 10.1080/00439339.2020.1789533
14. Salamon A: The reproductive behaviour of geese and its implications on production and welfare. World Poult Sci J, 81(1): 103-116, 2025. DOI: 10.1080/00439339.2024.2437173
15. Coulibaly F, Onbaşılar EE, Bakır B, Sarıçam İnce S: The effects of using UV light instead of formaldehyde in disinfection of hatching eggs on shell microbial load, embryo development, hatchability, and chick characteristics. Int J Environ Health Res, 34(8): 2852-2862, 2024. DOI: 10.1080/09603123.2023.2276361
16. Lourens A, Vanden Brand H, Meijerhof R, Kemp B: Effect of eggshell temperature during incubation on embryo development, hatchability, and posthatch development. Poult Sci, 84(6): 914-920, 2005. DOI: 10.1093/ps/84.6.914
17. Biesiada B, Banaszewska D, Koncerewicz A, Jóźwik A, Horbańczuk J: Examination of changes in selected external and internal egg traits during the geese laying season and their effect on gosling hatching results. Europ Poult Sci, 79, 1-11, 2015. DOI: 10,1399/Eps. 77
18. Kucharska J, Adamski M, Kuzniacka J, Kowalska E: Influence of the weight of hatching eggs on the hatchability indices and on the body weight of geese in rearing and after fattening with oats. Acta Sci Pol Zootechnica, 15, 67-82, 2016. DOI:10.21005/asp.2016.15.3.06
19. Amantai S, Omarkhozha N, Kazhgaliev NJ, Saginbaeva MB, Arney D: Hatchability and hatchling sex ratio depending on holding period and physical parameters of hatching eggs. Eur Poult Sci, Vol. 82, 228, 2018. DOI: 10.1399/eps.2018.228
20. Nakage ES, Cardozo JP, Pereira GT, Boleli IC: Effect of temperature on incubation period, embryonic mortality, hatch rate, egg water loss and partridge chick weight (Rhynchotus rufescens). Braz J Poult Sci, 5, 131-135, 2003. DOI: 10.1590/S1516-635X2003000200007
21. Tainika B, Abdallah N, Damaziak , Waithaka Ng'ang'a, ., Shah T, Wójcik W: Egg storage conditions and manipulations during storage: effect on egg quality traits, embryonic development, hatchability and chick quality of broiler hatching eggs. World's Poult Sci J, 80(1): 75-107, 2024. DOI: 10.1080/00439339.2023.2252785
22. Fulla ST, Gebreslassie AH: Evaluation of Egg Production, Fertility, Hatchability, Embryonic Mortality and Chick Quality of Different Chickens. Int J Anim Sci Technol, 8(3): 55-65, 2024. DOI: 10.11648/j.ijast.20240803.14
23. Salamon A, Kent JP: Manual egg turning is necessary for optimal hatching in geese. Int J Poult Sci, 15(2): 57, 2016. DOI: 10.3923/ijps.2016.57.61
24. Çopur G: Damızlık yetiştiriciliğinde kuluçka aksaklıkları. Hayvansal Üretim, 45(1): 31-35, 2004.
25. Karadağ S, Kırmızıbayrak T: Goose as an Increasingly Popular Poultry in Türkiye. VII. International Halich Congress on Multidisciplinary Scientific Research, p. 1095-1101, 2024. ISBN: 978-625-367-639-1