

UDC 636.32/38.082/.083(931)

**ANALYSIS OF INBREEDING IN ŻELAŻNIEŃSKA SHEEP FLOCK KEPT AT
RZD SGGW IN ŻELAZNA**

**A. Haska, Dr Sc
*Warsaw University of Life Sciences, Poland***

In recent years, the study of inbreeding in livestock populations has garnered increased attention, particularly in the context of genetic diversity and health outcomes. The Żelaźnieńska sheep flock, a Polish native breed, serves as a pertinent example that underscores the significant challenges associated with inbreeding. The analysis of the inbreeding level was carried out in a herd of Żelaznie sheep kept at the Agricultural Experimental Station of the Warsaw University of Life Sciences in Żelazna, based on breeding documentation covering the years from 2002 to 2021. The database created for the purposes of this study included 2559 individuals. In the studied population, the average value of the inbreeding coefficient has systematically increased over the years. The average value of the inbreeding coefficient for lambs born in 2021 was 5.69%. The results also showed a significant effect of inbreeding and year of birth on the birth weight of lambs. Furthermore, there is a notable correlation between rising inbreeding coefficients and declining lamb birth weights, which raises concerns about fertility issues that could impede reproductive success and potentially disrupt flock demographics. The study indicates that for each 1% increase in inbreeding, a resultant decrease of 0.034 kg in birth weight occurs, prompting an examination of how these changes likely affect lamb survival rates and overall population sustainability. This evidence underscores the urgency of managing genetic diversity within the Żelaźnieńska flock, as it is not merely a matter of animal

health and fertility; it is also crucial for ensuring overall flock productivity and the long-term viability of this valuable breed, particularly in adapting to local condition. The rising inbreeding coefficient raises concerns regarding potential inbreeding depression, which can negatively impact traits such as fertility and weight gain. The research highlights that elevated inbreeding levels correlate with decreased birth weight, indicating that genetic diversity is essential for the flocks overall health and productivity. Additionally, maintaining genetic diversity is crucial for livestock adaptability and resilience against environmental changes [1, 2]. Consequently, deliberate breeding practices are necessary to mitigate inbreeding risks and preserve the genetic diversity of the Żelaznieńska sheep population. The implications of increasing level of inbreeding are broad, manifesting in various forms, including diminished reproductive performance and increased susceptibility to diseases, which ultimately threaten the future of this breed. As emphasized in the conservation programs, understanding these dynamics is not merely academic; it is vital for the preservation of genetic diversity, especially for small populations at risk, as failure to address these issues can precipitate significant long-term adverse effects on both individual animals and the flock as a whole [3, 4, 5]. Therefore, continued monitoring of genetic diversity and proactive conservation efforts are not merely beneficial but essential for preserving the Żelaznieńska sheep breed. The findings on inbreeding in Żelaznieńska sheep present significant implications for the future of breeding practices within this native Polish breed.

References

1. Barczak E., Wolc A., Wójtowski J., Ślósarz P., Szwaczkowski T., 2009: Inbreeding and inbreeding depression on body weight in sheep. *Journal of Animal and Feed Sciences*, 18(1), 42–50.
 2. Doekes H. P., Bijma P., Windig J. J., 2021: How Depressing Is Inbreeding? A Meta-Analysis of 30 Years of Research on the Effects of Inbreeding in Livestock. *Genes*, 12(6), 926.
 3. Drobik W., Martyniuk E., 2009: Analysis of inbreeding in highly prolific Olkuska sheep flock. *Annals of Warsaw University of Life Sciences – SGGW Animal Science* No 46, 2009: 153–160.
 4. Drobik W., Martyniuk E., 2014: Practical aspects of genetic management of small populations – The Olkuska sheep example, *Acta Agriculturae Scandinavica, Section A — Animal Science*, 64:1, 36-48.
 5. Drobik W., Martyniuk E., 2016: Inbreeding and its impact on the prolific Polish Olkuska sheep population. *Small Ruminant Research*, 137, 28–33.
-



**МІНІСТЕРСТВО ОСВІТИ І НАУКИ
УКРАЇНИ**

**НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ
БІОРЕСУРСІВ**

І ПРИРОДОКОРИСТУВАННЯ УКРАЇНИ

**ФАКУЛЬТЕТ ТВАРИННИЦТВА ТА
ВОДНИХ БІОРЕСУРСІВ**

**КАФЕДРА ТЕХНОЛОГІЙ ВИРОБНИЦТВА
МОЛОКА ТА М'ЯСА**



НАУКОВІ І ТЕХНОЛОГІЧНІ ВИКЛИКИ ТВАРИННИЦТВА У ХХІ СТОЛІТТІ



**Матеріали Міжнародної науково-практичної конференції
присвяченої 95-річчю від дня народження доктора
сільськогосподарських наук,
професора, академіка УАН
Григорія Олександровича Богданова
6-7 березня 2025 р.**

Київ - 2025

УДК 636:001.8«XXV»(092)

М 33

Матеріали Міжнародної науково-практичної конференції *«Наукові і технологічні виклики тваринництва у XXI столітті»*, присвяченої 95-річчю від дня народження доктора сільськогосподарських наук, професора, академіка УААН Г. О. Богданова, м. Київ, НУБіП України, 6-7 березня 2025 року. 192 с.

Матеріали конференції подано у авторській редакції.