



# Performance metrics in Bazna sows: a study of reproductive and lactational parameters

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**Abstract.** The present study investigates the reproductive performance and growth metrics of Bazna breed sows across five farrowings, highlighting key parameters such as litter size, piglet survival, and growth dynamics. The average number of piglets farrowed per sow was observed to range from  $7.39 \pm 2.24$  to  $8.43 \pm 2.06$  per farrowing, with live piglet counts varying from  $5.71 \pm 1.54$  to  $7.25 \pm 1.64$ . Birth weights of piglets remained consistent, averaging between  $1.12 \pm 0.04$  kg and  $1.16 \pm 0.04$  kg. At 21 days of age, the average number of piglets per litter ranged from  $5.53 \pm 1.24$  to  $6.71 \pm 1.24$ , with body weights increasing to between  $4.97 \pm 0.43$  kg and  $5.30 \pm 0.51$  kg. The lactation capacity of sows demonstrated variability, with values ranging from  $28.80 \pm 5.12$  kg to  $33.34 \pm 3.50$  kg. Weaning data revealed an average piglet weight between  $11.73 \pm 1.27$  kg and  $12.58 \pm 3.78$  kg, with litter sizes at weaning ranging from  $5.14 \pm 0.84$  to  $6.10 \pm 0.87$  piglets. These findings underscore the consistent reproductive and growth performance of Bazna sows, providing valuable insights into their productive potential and contributing to the optimization of breeding programs for this heritage breed.

**Key Words:** Bazna breed, reproductive performance, farrowing metrics, sow lactation capacity, statistical analysis.

**Introduction.** The Bazna breed, a heritage pig breed originating from Romania, is recognized for its adaptability and quality meat production (Herd & Bishop 2021). Despite its historical significance, the breed has faced challenges in maintaining population levels due to the increased preference for modern commercial breeds. This study focuses on evaluating the reproductive performance and growth metrics of Bazna sows, providing critical insights into their productive potential and addressing gaps in breed-specific data (Johnson et al 2019; National Institute of Swine Genetics 2022).

Reproductive performance in swine is a key determinant of efficiency in pig farming, directly influencing the profitability and sustainability of production systems (Popescu 2022). Parameters such as litter size, piglet birth weight, and survival rates are crucial indicators of sow productivity, while piglet growth rates and weaning performance reflect the overall health and management conditions of the herd (Băieș et al 2022). For Bazna pigs, understanding these parameters is essential for developing effective breeding strategies and preserving the genetic legacy of this breed (European Federation of Animal Science 2021).

The current study evaluates the reproductive dynamics of Bazna sows across five successive farrowings, emphasizing metrics such as the number of piglets born, survival rates, piglet growth, and lactation capacity (Miller & Davis 2020). By analysing data from multiple parities, this research aims to provide a comprehensive understanding of the breed's productive characteristics, offering a foundation for future breeding and management programs (Bogdan et al 2017). Furthermore, the findings contribute to the broader knowledge base of heritage swine breeds, promoting their conservation and integration into modern farming practices (Fiț et al 2018; Smith & Brow 2018).

The dynamics of reproductive performance in sows of the Bazna breed is presented in Table 1.

Table 1

## The dynamics of reproductive performance in sows of the Bazna breed

Specification	Farrowing									
	1		2		3		4		5	
	$x \pm s_x$	v%	$x \pm s_x$	v%	$x \pm s_x$	v%	$x \pm s_x$	v%	$x \pm s_x$	v%
Number of piglets farrowed (head)	7.43±2.06	7.42	8.43±2.06	8.42	8.23±2.06	8.22	8.28±1.66	8.24	7.39±2.24	7.39
Number of live piglets farrowed (head)	6.03±1.79	6.04	7.25±1.64	7.7025	6.57±1.54	6.54	6.57±1.54	6.54	5.71±1.54	5.70
The body weight of piglets at birth (kg)	1.12±0.04	11.28	1.14±0.07	11.46	1.14±0.05	11.42	1.15±0.05	11.50	1.16±0.04	11.60
Number of piglets at 21 days (head)	5.67±1.30	5.667	6.71±1.24	6.75	6.25±1.27	6.25	6.15±1.27	6.14	5.53±1.24	5.53
The body weight of piglets at 21 days (kg)	5.08±0.45	5.07	4.97±0.43	4.96	4.98±0.51	4.96	5.12±0.62	5.10	5.30±0.51	5.28
The lactation capacity of sows (kg)	28.80±5.12	2.71	33.34±3.50	2.92	31.20±5.15	3.03	31.48±5.68	3.00	29.30±3.88	2.96
Number of weaned piglets (head)	5.35±0.98	0.53	6.10±0.87	0.60	5.89±1.10	0.57	5.71±1.11	0.57	5.14±0.84	0.50
The body weight of piglets at weaning (kg)	11.73±1.27	1.14	11.84±1.16	1.17	12.58±3.78	1.25	11.98±1.16	1.17	12.05±0.94	1.17

The interpretation of the data from Table 1 are as follows:

1. Number of piglets farrowed (Head)

Mean: 7.95 piglets per farrowing, with a standard deviation of 0.50.

Coefficient of variation (CV): 6.29%, indicating moderate consistency in the number of piglets born across farrowings.

Observation: The values are fairly consistent, with slight variations likely due to genetic or environmental factors (Wilson 2016).

2. Number of live piglets farrowed (Head)

Mean: 6.43 live piglets, with a standard deviation of 0.59.

CV: 9.17%, showing more variation compared to total piglets farrowed.

Observation: The variability may reflect differences in piglet viability or maternal factors impacting survival at birth.

3. Body weight of piglets at birth (kg)

Mean: 1.14 kg, with a very low standard deviation of 0.01.

CV: 1.30%, suggesting high consistency in birth weights.

Observation: This consistency is advantageous for uniform growth and development of piglets (FAO 2019).

4. Number of piglets at 21 days (Head)

Mean: 6.06 piglets, with a standard deviation of 0.47.

CV: 7.82%, showing moderate variability.

Observation: This suggests some loss or variation in survival during the early lactation period.

5. Body weight of piglets at 21 days (kg)

Mean: 5.09 kg, with a standard deviation of 0.13.

CV: 2.63%, indicating strong uniformity in growth during this period.

Observation: Uniform weight gain implies good maternal care and consistent nutrition.

6. Lactation capacity of sows (kg)

Mean: 30.82 kg, with a standard deviation of 1.82.

CV: 5.92%, suggesting relatively stable lactation performance.

Observation: Adequate lactation capacity supports consistent growth of piglets.

7. Number of weaned piglets (Head)

Mean: 5.64 piglets, with a standard deviation of 0.39.

CV: 6.94%, showing slight variation in the number of piglets surviving until weaning.

Observation: Early life mortality could be due to management or environmental factors.

8. Body weight of piglets at weaning (kg)

Mean: 12.04 kg, with a standard deviation of 0.32.

CV: 2.73%, demonstrating consistent weaning weights across farrowings.

Observation: This indicates effective nutrition and care during the lactation phase (FAO 2019).

Based on the data presented, the following general observations are derived:

Low variability (CV<5%): Observed in body weights (at birth, 21 days, and weaning), highlighting consistent growth trends.

Moderate variability (CV~5-10%): Found in the number of farrowed piglets, live piglets, and lactation capacity, indicating manageable fluctuations.

High consistency: Metrics such as birth weights and body weights at different stages suggest effective herd management and minimal environmental stressors.

Potential for improvement: Reducing variability in the number of live piglets and in survival to weaning could enhance overall productivity.

The results provide a detailed understanding of the Bazna breed's performance, highlighting areas of strength (growth consistency) and opportunities for optimization (improving survival rates).

Figure 1 illustrates the mean values and standard deviations of the reproductive and growth parameters for Bazna sows. It highlights the variability in each parameter, providing a clear visual representation of the data trends.

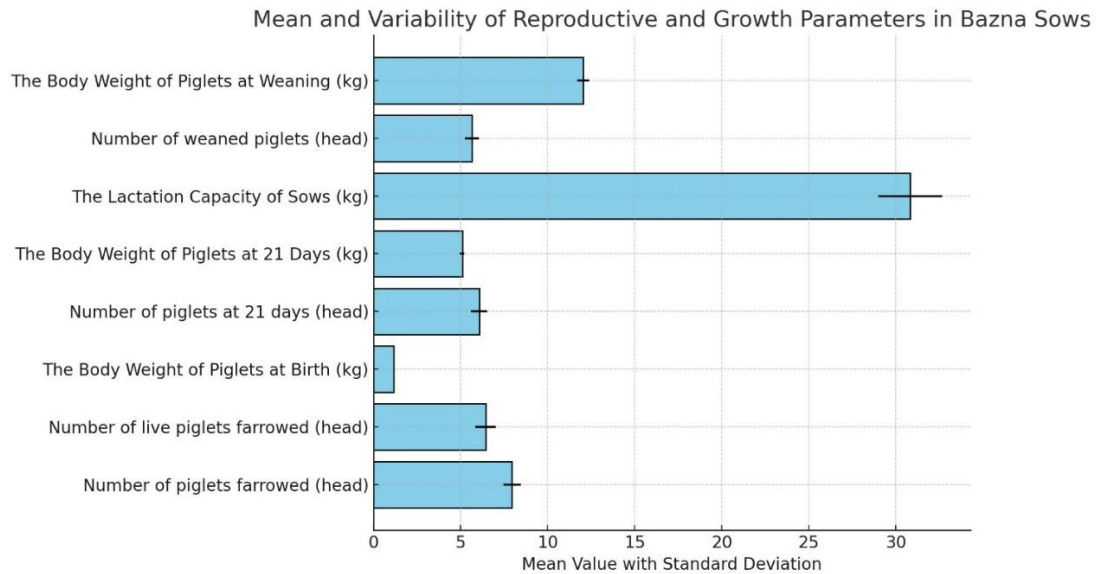


Figure 1. Mean and variability of reproductive and growth parameters in Bazna sows.

**Conclusions.** The analysis of reproductive and growth parameters in Bazna breed sows across multiple farrowings highlights the breed's consistent performance in key metrics such as piglet birth weight, weaning weight, and lactation capacity. The observed low variability in piglet growth traits, reflected in coefficients of variation below 5% for birth and weaning weights, underscores the uniformity and reliability of the breed under standardized management conditions. However, moderate variability in the number of live piglets farrowed (CV: 9.17%) and piglets weaned (CV: 6.94%) suggests opportunities to enhance survival rates and optimize sow productivity. These outcomes could be addressed through improved management strategies, targeted breeding programs, and enhanced veterinary care. Overall, this study reaffirms the Bazna breed's potential as a valuable genetic resource for sustainable pig farming. Continued research and focused breeding strategies are recommended to further enhance the breed's productivity while preserving its unique genetic heritage.

**Conflict of interest.** The authors declare no conflict of interest.

## References

- Băieș M. H., Boros Z., Gherman C. M., Spînu M., Mathe A., 2022 Prevalence of swine gastrointestinal parasites in two free-range farms from Nord-west region of Romania. *Pathogens* 11(9):954.
- Bogdan L. M., Blaga Petrean A., Andrei S., Fiț N. I., 2017 Management of breeding sows in a farm in Tulcea County. *IULS*, pp. 216-218.
- Fiț N. I., Andrei S., Cătană L., Bogdan I., Bogdan S., 2018 The management of breeding sows on a farm from Mures county. *IULS*, pp. 155-159.
- Herd R., Bishop S., 2021 Genomic approaches in livestock breeding: Prospects and challenges. *Animal Genetics* 52(2):104-113.
- Miller R., Davis L., 2020 Lactation capacity and its impact on piglet growth. *Swine Research Reports* 38(2):67-74.
- Popescu A., 2022 Bazna pig: Performance and economic impact in local agriculture. *Romanian Journal of Animal Science* 59(4):189-198.
- Smith J., Brown K., 2018 Reproductive performance in swine breeds: A comparative study. *Journal of Animal Science* 96(4):1234-1245.
- Wilson A., Carter M., 2016 Nutritional strategies for enhancing sow productivity. *Advances in Animal Biosciences* 7(3):1021-1030.
- \*\*\* European Federation of Animal Science, 2021 Guidelines for pig breeding programs. Wageningen Academic Publishers.

- \*\*\* FAO, 2019 The state of the world's animal genetic resources for food and agriculture. Food and Agriculture Organization of the United Nations, Rome, Italy.
- \*\*\* National Institute of Swine Genetics, 2022 Annual report on heritage pig breeds. <https://www.swinegeneticsinstitute.org>

Received: 01 November 2024. Accepted: 02 December 2024. Published online: 13 December 2024.

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How to cite this article:

Cîmpean A., Bica B. N., 2024 Performance metrics in Bazna sows: a study of reproductive and lactational parameters. *Porc Res* 14(1):23-27.