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PRIZE-WINNING PRODUCTIVITY, EXTERIOR, AND REPRODUCTIVE QUALITIES OF MARES OF THE UKRAINIAN TROTTING BREED

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This study examined the current population of the Ukrainian Trotting Horse breed, specifically analyzing the performance indicators (speed over set distances) and reproductive qualities of mares in the breeding nucleus. A high level of mare performance at racetracks (93.6%) was demonstrated, which supports the breed's selection trend; meanwhile, the average speed of mares over the standard distance of 1,600 m is quite high – 2.13,3 min. Of all the mares in the studied sample, 13.9 % fall into the 2.05-minute speed class and faster, and more than half – 57.2%, fall into the 2.10-minute speed class and faster. In recent years, the breed has produced its first two mares that have demonstrated a speed of 2.00 min over the standard distance of 1,600 m. An evaluation of the conformation of the studied sample of mares has established that they meet the target performance parameters for the breed. In particular, the mares in the mare massive of the Dibrivskiy Stud outperform mares from other enterprises in terms of speed, typicity, and body measurements; therefore, it can be concluded that this farm's breeding strategy is moving in the right direction by combining high competition performance with conformation traits. An analysis of the reproductive activity of the studied sample of mares has established that the current mare massive of the Ukrainian Trotting breed demonstrates high ecological adaptability and stable biological indicators of fertility.

Clearly, the prize-winning performance and reproductive function of mares of the Ukrainian Trotting breed serve as a reliable biological foundation for the further development of this breed. Thanks to long-term selection for performance and adaptability, these heifers demonstrate high fertility and excellent maternal qualities. However, the full realization of their genetic potential directly depends on the current level of veterinary care, a balanced diet, and the implementation of advanced reproductive techniques (including artificial insemination with semen from high-quality sires).

Keywords: horses, mares, Ukrainian Trotting breed, speed, exterior, reproductive function

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ПРИЗОВА ПРОДУКТИВНІСТЬ, ЕКСТЕР'ЄР І РЕПРОДУКТИВНІ ЯКОСТІ КОБИЛ УКРАЇНСЬКОЇ РИСИСТОЇ ПОРОДИ

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Досліджено сучасну популяцію української рисистої породи коней, зокрема – проаналізовано показники призової продуктивності (жвавості на встановлені дистанції) та репродуктивні якості кобил селекційного ядра. Доведено високий рівень випробування кобил на іподромах (93,6 %), що сприяє селекційному тренду породи, при цьому середня жвавість кобил на стандартну дистанцію 1600 м є досить високою – 2,13,3 хв. З усіх кобил дослідженої вибірки 13,9 % входять до класу жвавості 2.05 хв. і жвавіше і понад половину – 57,2 % – до класу 2.10 хв. і жвавіше. Останніми роками отримані в породі перші дві кобили, що проявили жвавість за 2.00 хв. на стандартній дистанції 1600 м. Оцінюванням екстер'єру дослідженої вибірки кобил встановлено, що вони відповідають цільовим параметрам роботи з породою. Зокрема, кобили маточного складу Дібрівського кінного заводу переважають кобил інших підприємств за жвавістю, типовістю та лінійними промірами тулуба, отже можна констатувати, що селекційна стратегія цього господарства спрямована у правильному русі поєднання високої призової продуктивності із екстер'єрними показниками. Аналізом репродуктивної активності дослідженої вибірки кобил встановлено, що сучасне маточне поголів'я української рисистої породи демонструє високий еколого-адаптаційний потенціал та стабільні біологічні показники фертильності.

Вочевидь, призова продуктивність і репродуктивна функція кобил української рисистої породи є надійним біологічним фундаментом для подальшого розвитку цієї нової вітчизняної породи. Завдяки тривалому відбору за робочими та адаптивними якостями, матки демонструють високу фертильність та відмінні материнські якості. Проте максимальна реалізація їхнього генетичного потенціалу безпосередньо залежить від сучасного рівня ветеринарного контролю, збалансованої годівлі та впровадження передових методів репродукції (включаючи штучне осіменіння спермою цінних плідників).

Ключові слова: коні, кобили, Українська рисиста порода, жвавість, екстер'єр, репродуктивна функція

Introduction. The Ukrainian trotting breed, which was officially recognized in October 2024 as an independent domestic breeding achievement, is the result of more than 30 years of painstaking work by Ukraine's leading scientists and horse breeders. The new breed was developed based on the local gene pool of trotters, incorporating the world's finest gene pools—the American Standardbred and French Trotting breeds. The history of the breed's development and the genetic foundations for creating the new breeding population are detailed in the works of scientists at Livestock Farming Institute

of the National Academy of Agrarian Sciences of Ukraine (Tkachenko & Tkachova, 2020; Tkachova et al., 2017, 2020, 2023–2026). The researchers emphasize that the breed was developed through the targeted selection of a base population of domestically bred trotters, utilizing corrective crossbreeding with American Standardbred and French trotter breeds. The new breed differs from other trotting breeds in its set of traits and exhibits variations based on geographic origin, breeding methods, and genetic markers (Tkachova, 2024).

In the course of breeding work to improve prize trotters, crossing with stallions-breeders of the American Standard Breed was introduced. In Ukraine, crossing has not acquired such a wide and, in fact, absorbing character. With the beginning of re-crossing in 1960 and up to the present time, i.e. for almost 50 years, about 23 brooders of the American Standard Breed were used in Ukrainian farms, while only 11 of them were used naturally, and the rest were used as sperm production in small quantities. And, in fact, the population of horses of the Russian trotting breed of Ukraine was bred "in itself", and the crossing did not exceed 10-15% (Tkacheva et al., 2025).

Purposeful work on the breeding of the Ukrainian trotting breed was carried out in 2000 under the methodological guidance of the Institute of Animal Husbandry of the National Academy of Sciences of Ukraine in the state stud farms of Ukraine – modern branches of the state enterprise "Horse Breeding of Ukraine": "Dibrivskiy Stud No. 62", "Zaporizkiy Stud No. 86" et all breeding reproducers: Myrohoshchanskiy Agrarian College, LLC "Trading House "Roda", PSP "Komyshanske" (Tkachova, 2024).

Since 2002, crosses at the level of blood fusion with the French trotter breed have been introduced to improve exterior and distance characteristics (Tkachova, 2023).

In 2015, the first Breeding Program for horses of the Ukrainian Trotting breed group was approved (Tkachenko et al., 2015). In 2016, the first stage of field testing was conducted at horse breeding farms – branches of the state enterprise “Horse Breeding of Ukraine” – and at leading breeding stock facilities (Tkachova et al., 2017). In 2024, in connection with the updating of records and the improvement of breeding characteristics, the materials from the testing of the new trotting breed were updated, and a commission evaluation and approval of the new breeding achievement were conducted (Tkachova, 2024). The effectiveness of simple and complex inbreeding at moderate and distant levels using world-class sires (Stars Pride, Worthy Boy, Low Hanover, Reprise Hoot Moon, Speedster, and others) has been demonstrated. To enrich the gene pool and improve key breeding traits, limited crossbreeding was conducted with the best representatives of the American Standardbred and French Trotting breeds (Tkachova & Lyutikh, 2026).

An analysis of the genealogical structure of the breeding stock, conducted by researchers, indicates a high degree of differentiation within the broodmare herd. In particular, the mares were found to be descended from nine main genealogical lines, among which the Spidi Crown line is the most numerous and commercially significant (34.3% of the broodmare herd). It has been confirmed that the use of such crossbreeding has allowed for the consolidation of the breed in terms of conformation and show performance without causing a decline in reproductive capacity (Tkachenko & Tkachova, 2015, 2017, 2020).

In trotting horse breeding, it is traditional to test prospective broodmares for liveliness. Studies of the reproductive core of Ukrainian trotting mares (I. V. Tkachova et al., 2025) demonstrate a strong selection trend: 91.6% of mares in the breeding stock completed a full cycle of racetrack trials (at 2–3 years of age), and particularly spirited mares were tested even at an older age.

This breed is characterized by early maturity. For example, mares from the Zaporizkiy Stud demonstrate high reproductive and working maturity as early as 2 years

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of age, with an average speed score of 2.249 minutes. Approximately 12% of the evaluated mares in the breeding stock are classified as elite in terms of liveliness (Tkachova, 2023).

Scientific publications by domestic researchers (Tkachova et al., 2025) devote significant attention to the working qualities of mares by bloodline. It has been scientifically established that the earliest-maturing and most agile two-year-old mares belong to the Low Hanover and Worthy Boy bloodlines. A number of authors note that intensive training serves as a kind of physiological test: mares that withstand prolonged exertion on the racetrack without musculoskeletal disorders subsequently demonstrate greater reproductive longevity under breeding conditions (Kurhaluk et al., 2025).

In recent studies (Tkachova et al., 2025, 2026), particular emphasis has been placed on preserving genetic diversity and digitizing breeding records (the State Stud Books) as the sole tool for controlling inbreeding depression and optimizing the breeding process within the breed.

Since the key objective of breeding was to create a prize-winning horse that is highly productive in terms of vitality and, at the same time, adapted to local conditions, the reproductive function of mares of the Ukrainian Trotting breed became one of the most important criteria for the stability and viability of the new breeding population, which became the focus of our research.

Materials and methods. The research was based on a database compiled from breeding records of trotting breeds at the Horse Breeding Selection Center of the Institute of Animal Husbandry of the National Academy of Agrarian Sciences of Ukraine and the State Enterprise "Agency for Animal Identification and Registration," as well as data from field surveys of horse breeding farms and breeding stock in Ukraine. Indicators of racing performance (speed over a 1,600-meter distance) were analyzed based on data from annual reports of racetrack trials of domestically bred trotting horses. The horses were grouped by gender and age (2, 3, 4 years, and older). An analysis was conducted of the breeding effectiveness of mares from the breeding nucleus based on the following indicators: the number of mares mated, those that were withdrawn before results were determined, those that were not inseminated, those that became pregnant, those that aborted, and those that gave birth to foals. The percentage of mares that became pregnant, the percentage of successful foaling's, and the foal yield were determined using a calculation method. Statistical calculations were performed in Microsoft Excel.

Research results. As of January 1, 2026, the total number of horses of the Ukrainian trotting breed numbered 350 heads, including 108 mares of the desired type. We have studied the breeding core of the breed, concentrated in breeding subjects (Table 1).

Table 1

Number of breeding horses studied

Stud	Total	Sires	Mares	Replacement young mares
Dibrivskiy Stud	35	4	25	6
Zaporizkiy Stud (evacuated)	49	5	31	13
Other reproductions	26	-	10	16
Total:	**110**	**9**	**66**	**35**

Of all the mares in the breeding stock of the Ukrainian Trotting breed, 93.6% were tested on racetracks, with an average speed of 2.133 min. (Table 2) The mares' speed results were compared over the classic 1,600-meter distance; this distance was chosen

because significantly fewer horses—and even fewer mares – are tested over longer distances (2,400 m, 3,200 m, 4,800 m). At Zaporizkiy Stud No. 86, all mares except one (98.0%) were tested. The most agile mares were selected for the breeding stock of Dibrivskiy Stud No. 62 (average agility of 2.081 min).

Mares of other trotting breeds and crossbreeds, which are permitted for breeding with the Ukrainian Trotting breed, must meet higher requirements across a range of traits, since the goal of using them is to improve the newly established Ukrainian Trotting breed while simultaneously enriching the gene pool. Therefore, for further improvement of the breed, only tested mares with high agility scores and early maturity are selected, as they are capable of improving the breeding traits of their offspring. The average speed of mares approved for breeding is 3.1 seconds faster, at 2.10.2 minutes. The average speed of all broodmares is 2.12.3 minutes per 1,600 meters.

Table 2

The number of tested mares and indicators of their agility at a distance of 1600 m

Studs	Tested mares		Average speed, min
	total	%	
Ukrainian Trotting breed			
Dibrivskiy Stud	35	*94,6*	2.08,1±0,73
Zaporizkiy Stud	48	*98,0*	2.13,4±1,45
LLC "Trading House "Roda"»	5	*100,0*	2.08,7±1,75
Other reproductions	37	*86,0*	2.18,5±2,08
Individuals	6	*100,0*	2.14,5±4,46
On average:	**131**	***93,6***	**2.13,3±0,90**
Mares of other breeds and crossbred allowed for reproduction			
LLC "Trading House "Roda"»	37	*100,0*	2.09,4±1,25
Other reproductions	23	*100,0*	2.09,4±1,25
Individuals	7	*100,0*	2.07,4±1,30
On average:	**67**	***100,0***	**2.10,2±0,99**
Total:	**198**	***95,7***	**2.12,3±0,70**

In terms of prize-winning speed (Table 3), mares from the Zaporizkiy Horse Breeding Farm No. 86 outperform mares from other horse breeding farms with a high degree of statistical significance ($p < 0.01$) (average speed at 2 years of age: 2.249 ± 1.47 min), however, they are outperformed by the mares of “Roda” Trading House LLC.

Table 3

Indicators of speed of breeding mares of the Ukrainian Trotting breed for a distance of 1600 m at different ages

Stud	Speed of mares of reproductive composition (min.) at the age of:		
	2-year-old	3-year-old	4-year-old
Dibrivskiy Stud	2.26,5±1,75	2.11,3±0,73	2.05,4±0,64
Zaporizkiy Stud	2.24,9±1,47	2.11,7±0,77	2.10,0±0,74
LLC "Trading House "Roda""	2.15,1±0,99	2.07,8±1,19	2.02,8
Other reproductions	2.28,1±1,49	2.17,2±1,77	2.10,9±1,24
Individuals	2.26,2±4,57	2.10,6±2,54	2.06,6±3,10
Total:	**2.26,4±0,90**	**2.13,3±0,72**	**2.08,9±0,59**

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It is natural that mares exhibit their best (lifetime record) agility at an older age; the highest agility was observed in mares from the Dibrivskiy Stud No. 62 (2.05.4 ± 0.64 min). However, some mares exhibit record-breaking agility at age 3; sometimes, a high level of agility is observed as early as age 2, in which case the mare's testing is concluded so she can be returned to the stud farm sooner to produce agile offspring.

Of all the mares in the breeding nucleus of the newly established breed and those approved for breeding, 13.9% fall into the 2.05 min agility class or higher, and more than half – 57.2 % – fall into the 2.10 min agility class or higher. In recent years, the first two mares with a speed of over 2.00 min have been produced (Table 4). A very small number of mares remain untested or under-tested due to veterinary or economic reasons unrelated to their genetic potential, despite having been selected for the breeding nucleus based on pedigree and conformation.

Table 4

Distribution of mares of the breeding nucleus of the newly created trotting breed by speed classes

Speed on 1600 m	Ukrainian Trotting breed		Other accepted breeds and crossbreeds		Total	
	n	***%***	**n**	***%***	**n**	***%***
2.00 and faster	-	-	2	*2,9*	2	*1,0*
2.00,1– 2.02,0	1	*0,7*	2	*2,9*	3	*1,4*
2.02,1 – 2.05,0	15	*10,7*	9	*13,2*	24	*11,5*
2.05,1 – 2.08,0	33	*23,6*	21	*30,9*	54	*26,0*
2.08,1 – 2.10,0	25	17,9	11	*16,2*	36	*17,3*
2.10,1 – 2.15,0	23	16,4	10	*14,7*	33	*15,9*
2.15,1 – 2.20,0	14	10,0	4	*5,9*	18	*8,7*
2.20,1 – 2.25,0	6	4,3	3	*4,4*	9	*4,3*
2.25,1 – 2.30,0	2	1,4	4	*5,9*	6	*2,9*
2.30,1 – 2.35,0	8	5,7	1	*1,5*	9	*4,3*
2.35,1 – 2.40,0	2	1,4	1	*1,5*	3	*1,4*
2.40,1 – 2.45,0	1	0,7	-	-	1	*0,5*
2.45,1 – 2.50,0	1	0,7	-	-	1	*0,5*
2.50,1 and more slowly	1	0,7	-	-	1	*0,5*
Not tested	8	*5,7*	-	-	8	*3,8*
Total:	**140**		**68**		***208***	
Average, min	***2.13,3±0,90***		***2.10,2±0,99***		**2.12,3±0,70**	

The speed mares in the modern reproductive composition of the Dibrivskiy Stud: Gymnasia 2.00.9, 2017 (Montpellier – Gringa), Vologda 2.02.3, 2008 (Graph – Villa), Cohort 2.02.8, 2018 (Graph – Kolomna), Miss Mona 2.02.9, 2011 (Montpellier – Moscva). In the reproductive composition of the Dibrivskiy stud farm, 11 mares (29.7%) are included in the liveliness class of 2.05 min. and livelier, 15 mares (40.5%) are included in the liveliness class of 2.10 min. and livelier. At the same time, there are few mares of lower classes of liveliness (2.30.1 minutes quieter) - 8.5%. In Zaporizkiy Stud, 27 mares showed agility for 2.10 minutes. (55.1%).

Mares in the breeding stock of horse breeding farms were evaluated based on linear body measurements: height at the withers, oblique body length, chest

circumference, and pastern circumference (Table 5). Based on these linear measurements, the mares meet the target parameters for breeding within the breed. Mares from the Dibrivsky Horse Breeding Farm outperform mares from other farms in withers height, body length, and pastern circumference ($p < 0.05$); therefore, it can be concluded that this farm's breeding strategy is moving in the right direction by combining high competition performance with conformation traits. Mares from the Zaporizkiy Stud are distinguished by the largest chest circumference. Mares of the Ukrainian Trotting breed generally have greater height at the withers (by 3.4 cm), diagonal body length (by 1.1 cm), and pastern circumference (by 0.23 cm), whereas mares of other breeds and crossbreds approved for breeding have a larger chest circumference (by 1.7 cm), since the goal of using them is to improve precisely this trait.

Table 5

Indicators of body measurements of breeding mares

Stud	n	Linear measurements of the body, cm			
		Height at the withers	Oblique body length	Chest coverage	Fetlock coverage
Ukrainian Trotting breed					
Dibrivskiy Stud	37	162,2 ±0,58	163,7 ±0,71	181,5 ±0,74	20,0 ±0,11
Zaporizkiy Stud	49	159,9 ±0,46	163,0 ±0,51	183,1 ±0,71	19,92 ±0,09
Other reproductions	43	159,2 ±0,49	161,6 ±0,54	181,7 ±0,45	19,84 ±0,08
Mares of other breeds and crossbred allowed for reproduction	68	157,7 ±2,21	161,4 ±0,68	183,4 ±0,75	19,64 ±0,10
Всього:	**208**	**159,3 ±0,75**	**162,1 ±0,32**	**182,3 ±0,36**	**19,79 ±0,05**

By generalizing the results of appraisal of experimental mares, it was established (Table 6) that the mares of the Dibrivskiy stud farm received the highest score for origin, type, exterior and prize performance ($p<0.05$). For measurable indicators, the mares of the Lymariv stud farm received the highest rating. According to the main indicators of appraisal, mares of all stud farms correspond to the "elite" class.

Table 6

Indicators of expert assessment of breeding mares of the Ukrainian Trotting breed

Stud	Evaluation indicators, points				
	Pedigree	**Type**	**Exterior**	**Measurements**	**Performance**
Dibrivskiy Stud	9,10 ±0,10	8,55 ±0,09	8,65 ±0,11	8,23 ±0,08	8,03 ±0,25
Zaporizkiy Stud	9,39 ±0,08	8,14 ±0,10	7,84 ±0,08	7,91 ±0,23	7,37 ±0,21
Other reproductions	8,98 ±0,02	8,47 ±0,08	8,07 ±0,10	8,33 ±0,13	6,93 ±0,32
On average:	**9,15 ±0,05**	**8,37 ±0,06**	**8,14 ±0,06**	**8,15 ±0,10**	**7,37 ±0,16**

To determine the influence of the hippodrome on the indicators of speed of mares of the Ukrainian Trotting breed, the average indicators of liveliness at different Hippodromes of Ukraine were estimated (Table 7).

Table 7

Characteristics of mares of the Ukrainian Trotting breed in terms of agility at a distance of 1600 m, tested at various racetracks

Hippodrome	Speed, min		
	2-year-old horses	**3-year-old horses**	**4-year-old horses**
Kyiv Hippodrome	2.25,7±1,27	2.12,0±0,90	2.08,6±1,00
Odesa Hippodrome	2.27,1±1,27	2.14,2±1,01	2.09,1±0,87
On average:	**2.26,4±0,90**	**2.13,3±0,72**	**2.08,9±0,59**

The mares tested at the Kyiv Hippodrome significantly outperformed their peers tested at the Odesa Hippodrome in terms of both record-breaking speed and speed demonstrated across all age groups.

Overall, mares of the Ukrainian Trotting breed from the breeding stock of all breeding organizations are characterized by high prize-winning performance – more than half of them fall into class 2.10, and 57.2% are even more spirited. The most outstanding are: mares from the Dibrivskiy Stud – Kaluga 2.01.6 (record holder at the Kyiv Racetrack and in Ukraine for all distances), Bury 2.02.4 (CIS record holder for the 2,400 m distance), and Gimnaziya (the Ukrainian record holder for 2,400 m and 4,800 m); mares from the Zaporizkiy Stud – Omega 2.04.2, Palitra 2.02.9, Resnytsia 2.05.0, Khlopushka 2.03.0 (Ukrainian record holders), Opala 2.04.9; mares from the Other reproductions, winner of 17 traditional prizes: Figura 2:06.8 (record holder at the Odesa Hippodrome), Ossetia 2:09.5 (record holder at the Kyiv Hippodrome).

The herd replacement rate is an economically important metric that also serves as an indicator of successful breeding programs. In recent years, horse replacement rates – including those for the Ukrainian Trotting breed – have declined, due to economic crises and a limited market for non-breeding yearlings.

With a small number of broodmares, the workload on stallions – even with the use of artificial insemination – is low: on average, 4 to 7 mares per season (compared to the standard of 10-12), which hinders the breed's breeding progress and the assessment of the breeding value of mares and sires based on the quality of their offspring (Table 8).

Table 8

Indicators of reproduction of horses of the Ukrainian Trotting breed

Showcases	Years				
	2019	**2020**	**2021**	**2022**	**2023**
Mated mares with 1 stallion	5,0	7,0	4,0	5,0	5,0
Percentage of fertilization	74,2	70,7	60,2	63,2	73,5
Percentage of successful foals	61,3	67,5	51,4	50,1	65,8
Foal yield per 100 mares, %	59,0	63,0	59,8	48,6	47,8

The reproductive performance indicators for mares of the Ukrainian Trotting breed, broken down by breeding organizations, are presented in Table 9.

Table 9

Breeding statistics for mares by horse breeding farm

Stud	Number of mares covered by a 1 sire	Indicator, %			Successful foaling, %	Foal Birth Rate, %
		fertilization	no fertilization	abortions		
Dibrivskiy Stud	9	73,5	26,5	12,0	88,8	64,7
Zaporizkiy Stud	13	88,0	12,0	34,1	65,9	58,0
Other reproductions	10	89,6	10,4	4,7	95,3	85,1
On average:	***10***	***84,8***	***15,1***	***17,9***	***82,1***	***69,7***

It is evident that the current mare massive of the Ukrainian Trotter breed demonstrates high ecological adaptability and stable biological fertility indicators. Under appropriate husbandry conditions and a balanced diet, the reproductive performance of mares is as follows:

• The conception rate remains consistently within 85 %. The combination of genotypes from domestic mares with high-performance foreign bloodlines has made it possible to maintain robust health and a strong physiological response to mating;

• The rate of successful foaling is 82 % of the number of successfully inseminated mares, indicating a low rate of embryonic mortality in the late stages of gestation;

• The net yield of foals per 100 mares by weaning is 70%, which fully meets the farms' needs for self-renewal (replenishment of the mare massive) and provides breeding stock for sale.

A distinctive feature of Ukrainian Trotter breed is the inseparable link between mares' competitive performance (agility) and their subsequent use in reproduction. Strict selection ensures that only physiologically robust animals are placed in the breeding herd:

• More than 93% of mares in the breeding stock undergo testing at racetracks. This allows for an assessment of the cardiovascular, respiratory, and musculoskeletal systems under stress. Mares that successfully complete the training have better muscle tone, which has a positive effect on pregnancy and foaling.

• Quality of the mare massive: the average pace of mares in the breeding herd is approximately 2.1–3 min over a distance of 1,600 m. At leading breeding farms (branches

of the State Enterprise "Horse Breeding of Ukraine," particularly the Dibrivskiy Stud), elite broodmare lines have been established with an average speed of 2.081 minutes.

• Conformation: Priority in breeding is given to mares with a sturdy and lean build, a harmonious body structure, and a deep chest, which physiologically facilitates gestation. Despite the genetic resilience and adaptability of the Ukrainian Trotting breed to Ukraine's climatic conditions, reproductive efficiency may be limited by a number of factors (Brinsko et al., 2010). Modern veterinary and zootechnical management focus on the factors that limit mare reproduction under current conditions. The main detrimental factors are considered to be:

• Infectious and non-infectious pathologies: as evidenced by an analysis of veterinary records from horse breeding enterprises, latent forms of infections (e.g., equine herpesvirus—rhinopneumonitis, or leptospirosis) pose the greatest threat to stable reproduction. These can cause abortions, the birth of non-viable foals, or frequent "over-estrus" (repeated estrus cycles due to infertility).

Nutritional factors: Although mares of Ukrainian breeding are resistant to seasonal weight fluctuations (the winter-summer weight difference is insignificant), the balance of trace elements and vitamins in the diet remains critical during preparation for the breeding season and in the first months of lactation.

Consequently, an analysis of performance, conformation, and reproductive management in a test sample of mares has demonstrated a consistent increase in vitality, preservation of the original type and conformation, and high conception and successful foaling rates for locally bred mares under current economic conditions in Ukraine. These parameters are consistent with historical biological norms for trotting breeds but exhibit greater plasticity.

Discussion. Many researchers have demonstrated that the breeding traits of horses in the performance category depend significantly on the genotypic component (Thiruvenkadan et al., 2009; Jansson et al., 2022), as well as technological and environmental factors (Crevier-Denoix, 2017; Sole, 2020; Kallerud, 2020; Verdegaal et al., 2021; Egenvall et al., 2022; Kurhaluk et al., 2025).

Improving reproductive efficiency directly benefits the competitive horse industry and the rural areas where horse-breeding enterprises operate, ensuring a stable supply of horses, which helps sustain their livelihoods (Wadham et al., 2023). Another aspect of the importance of horses is their popularity as pets, for racing, and for commercial purposes. Desirable offspring and bloodlines are selected for breeding to produce high-quality offspring that can be sold at a substantial profit. Selective horse breeding is becoming increasingly popular in several countries as a profitable means of selling offspring (McGivney et al., 2020).

Following the classic "best of the best" breeding approach, breeders select mares with the best overall conformation for their mare massive and pair them with the best, most prepotent stallions to produce foals with improved abilities. The selection of a broodmare is determined by pedigree, performance records, conformation, and, sometimes, temperament (Sharman et al., 2022). Many owners of sport and prize-winning horses prefer their mares to foal early in the year, but this can be challenging due to the short breeding season and varying gestation periods (Gee et al., 2017). Breeders use various methods to ensure foals are born earlier, ideally in early January in the Northern Hemisphere and in August in the Southern Hemisphere. Mares raised in different hemispheres exhibit different reproductive behaviors. Consequently, mares raised in the Northern Hemisphere have a reproductive season consisting of anestrus in winter, a spring transition (approximately mid-February to mid-March), an ovulation season (April–September), and a fall transition back to anestrus (Cuervo-Arango & Clark, 2010).

Young horses are typically classified by age when they are put up for sale: foals (newborns), yearlings, and two-year-olds. Foals born early in the year are kept separate from the others, which gives them a feeding advantage and reduces the risk of bone fractures. In addition, their increased interaction with people has a positive effect on their behavior (Gramm & Marksteiner, 2010). According to breeders, foals born earlier are more likely to fetch a higher price at auction, as they are also expected to perform better than foals born later (Arango-Sabogal et al., 2022).

To improve the reproductive performance of mares, it is important to consider various environmental factors, such as age, season, and nutrition, as well as pathological factors, such as reproductive diseases and parasitic infestations. These considerations are necessary to prevent economic losses caused by the high costs associated with maintaining broodmares throughout the year when fertility and conception rates are low (Katila et al., 2010).

Mares typically ovulate 24–48 hours before the end of estrus, but the timing of their ovulation is less predictable than in other animals (cattle, sheep, pigs). Accurately determining a mare's reproductive status is a challenging task, which often leads to missed breeding opportunities and lower pregnancy rates during the breeding season.

To increase mare fertility and conception rates during the breeding season or to produce foals earlier in the year, the estrus cycle is selectively manipulated using exogenous hormones (El-Mokadem, 2017), artificial light therapy (Lutzer et al., 2022), and the selection of an appropriate breeding period (Fanelli et al., 2022). Other key aspects to consider for a successful horse breeding program include stallion welfare, environmental stress, and dietary supplements.

An analysis of global research findings suggests that improving the reproductive performance of mares (under stable economic conditions) involves optimizing feeding, managing the breeding season using artificial lighting, employing veterinary reproductive technologies, and ensuring good health. Key strategies include feeding to achieve optimal body condition, the use of artificial lighting in winter (16 hours of light per day), and the use of hormone therapy to induce ovulation or synchronize estrus.

Conclusion. The performance and reproductive capacity of mares of the Ukrainian Trotting breed provide a solid biological foundation for the further development of this new domestic breed. Thanks to long-term selection for working and adaptive qualities, the mares demonstrate high fertility and excellent maternal qualities. However, the full realization of their genetic potential directly depends on the current level of veterinary care, a balanced diet, and the implementation of advanced reproductive techniques (including artificial insemination with semen from high-quality sires).

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