Scientific Papers. Series D. Animal Science. Vol. LXVIII, No. 2, 2025
ISSN 2285-5750; ISSN CD-ROM 2285-5769; ISSN Online 2393-2260; ISSN-L 2285-5750

PARTIAL RESULTS REGARDING THE MORPHO-PRODUCTIVE EVALUATION OF THE ROMANIAN TROTTER - THE ENERGETIC CAPACITY

Mihai PRUNĂ[1], Marius MAFTEI[1], Ana Maria PRUNĂ[1], Livia VIDU[1], Dorel DRONCA[2], Marius DOLIȘ[3], Alexandru Vladimir VÎRGOLICI[4], Gheorghe Emil MĂRGINEAN[1]

[1]University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Mărăşti Blvd, District 1, Bucharest, Romania
[2]University of Life Sciences "King Mihai I" of Timișoara, 119 Calea Aradului, Timișoara, Timiș County, Romania
[3]"Ion Ionescu de la Brad" Iași University of Life Sciences, 3 Mihail Sadoveanu Alley, Iași County, Romania
[4]Equilife Vet, 132 Chemin du Haut Sauret, 61110 Cour-Maugis sur Huisne, France

Corresponding author email: mariusmaftei@gmail.com

Abstract

This study represents another stage of a large-scale research regarding improving the racing performances of the Romanian Trotter. Regarding the productive potential (speed) of the Romanian Trotter, the specialty literature presents some results that highlight the inferior level of this breed compared to its competitors. In order to carry out the analysis of the productive potential of the individuals that make up the reproductive nucleus of the Romanian Trotter, only the productive performances of the native individuals were taken into account. It was analyzed career records (the best performance achieved in the career, expressed in minutes, seconds and hundredths/kilometer) of the entire reproductive nucleus of Romanian Trotter (60 individuals). The results obtained in assessing energetic capacity were then analyzed in accordance with the national standards for appreciation and ranking of Romanian Trotter horse, and in comparison with the results of other authors recorded some time ago (in order to demonstrate progress). The average value of the productive performance, in the reproductive nucleus, was 1'25"77/km. This value does not differ much from that calculated by Velea et al., of 1'25"95.

Key words*: hippodrome, horse, racing, Romanian Trotter.*

INTRODUCTION

This study represents another stage of a large-scale research regarding improving the racing performances of the Romanian Trotter. Only when we know very well where we are and the causes that contribute to it can we begin developing breeding programs (Popa 2009; Maftei et al., 2022a).

Some research has highlighted the lower productive potential of the Romanian Trotter compared to other trotter breeds (Marginean et al., 2012, 2005). But no one has taken into account the performances achieved by Romanian Trotter individuals on racetracks in Hungary, Germany, Russia, etc.. All Romanian Trotters who participated in trotting races outside Romania have understantially improved their career records. We recall here the stallions Orologiu (1'19"8 in Romania - 1'16 in Germany), Ordonat (1'26"3 in Romania - 1'17"6 in Hungary), Valter (1'21"4 in Romania - 1.15"3 in Germany), Rarău (1.17"5 at Moscow), Laureat (1.18"4 in Romania - 1.16"5 in Hungary), Kamaris (1.32"8 vs 1.21"7 at 2 years in Hungary), the mares Olandeza, Tincuta (broodmares in Germany, imported at the age of 3 years), etc. Moreover, individuals from the Romanian trotter herd were imported to countries such as Germany, Austria, Hungary, or Czechoslovakia being used as sire stallions or broodmares, being sold or rented (only stallions was rented).

The influence of environmental factors in this case is obvious, and we are referring here especially to race track conditions, but no one took this fact into account. It is obvious that a study on phenotypic, genotypic and environmental correlations, for Romanian Trotter, is required as has been done in other

horse breeds in Romania (Maftei et al., 2022b, 2018).

MATERIALS AND METHODS

The biological material is represented by the entire reproductive nucleus of Romanian Trotter from National Stud Dor Marunt (60 individuals, of which 6 sire stallions and 54 broodmares). We would like to point out that in the reproductive nucleus of the Romanian Trotter from the Dor Marunt National Stud, there are two more imported stallions that were not included in this study (it is obvious why).
In order to rank individuals based on speed, several criteria are used worldwide. For the Romanian Trotter is taken into account the RECORD, meaning the best performance achieved, expressed as time/1000 meters.
All analyzed times were recorded in public races on racetracks in Romania. It was analyzed individual performances, performances separated by sexes and also performances at the level of reproductive nucleus. Statistical analyses correlated with national horse grading and classification standards were used (www.anarz.eu).

RESULTS AND DISCUSSIONS

In Table 1 is presented performance of sire stallions, and in Figure 1 is represented graphic the distribution of values.

Table 1. Performances of sire stallions

No	INDIVID	SEX	Year of birth	RECORD	Seconds/ km
1	BIZAR	M	2004	1'20,9	80.9
2	VARTEJ	M	2009	1'21,6	81.6
3	NELUTU	M	2010	1'21,7	81.7
4	VIS	M	2002	1'22,1	82.1
5	NUROFEN	M	2002	1'22,5	82.5
6	OLIMP	M	2009	1'23,2	83.2
X				1'22'	82.00
STDEV					0.795
Sx					0.3555
CV %					0.9695

It is obvious that the stallion Bizar holds the supremacy in terms of the achieved performance, 1'20.9/km, at the opposite pole being the stallion Olimp who achieved a time of 1'23.2/km. However, we would like to point out that the record recorded by the stallion Olimp was achieved over a distance of 2800 meters. It is very likely, as happens in the case of handicap races, that the stallion's productive potential is superior to the achieved record, or as they say on the racetrack 'to have seconds left in his belly'. The other four sire stallions recorded intermediate values.

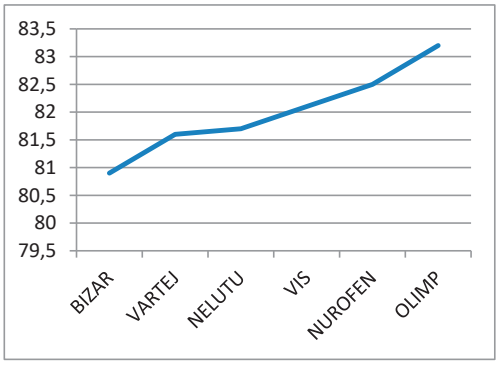


Figure 1. Distribution of values in sire stallions

In terms of the criteria for grading and ranking breeding horses, in relation to this character, all sire stallions fall into the RECORD class, obtaining a score of 10 (Tables 2 and 3).

Table 2. Energy capacity assessment grid at Romanian Trotter

Score	Age (years)			
	2	3	4	Over 4
10	Under 1'26"	Under 1'24"5	Under 1'24"	Under 1'23"5
9	Under 1'28"	Under 1'26"5	Under 1'25"	Under 1'24"
8	Under 1'31"	Under 1'27"5	Under 1'26"	Under 1'24"5
7	Under 1'33"	Under 1'28"5	Under 1'27"	Under 1'25"
6	Under 1'35"	Under 1'31"	Under 1'27"5	Under 1'25"5

Table 3. Breeding horse classification scales for energy capacity (minimum) (according to the bonitation criteria for the assessment of breeding horses)

Specification	RECORD		ELITE		CLASS I	
	Stallions	Mares	Stallions	Mares	Stallions	Mares
Energetic capacity	9	8	8	7	7	6

The performances of the broodmares from the reproductive nucleus of Romanian Trotter are shown in Table 4, and their graphic representation can be seen in Figure 2. It is easy to see that the average performance of the mares is inferior to that of the stallions, due to the introduction of mares to reproduction at the age of 3.5-4 years (interruption of sporting activity).

Table 4. Performances of broodmares

No.	INDIVID	YEAR of BIRTH	RECORD	Sec./km
1	NEVADA	2003	1'18,4	78.4
2	SIMETRIA	2000	1'22,0	82
3	RASFATATA	2014	1'22,5	82.5
4	KITTY	2010	1'22,8	82.8
5	VRAJA ZORILOR	1998	1'23,0	83
6	SIAMEZA	1999	1'23,2	83.2
7	PAMELA	2007	1'23,3	83.3
8	KINTA	1998	1'23,8	83.8
9	PATIMA	2014	1'23,9	83.9
10	SERENA	2011	1'24,4	84.4
11	NEDORA	2007	1'24,5	84.5
12	KISS ME	2011	1'24,6	84.6
13	VOIAJORA	2007	1'24,6	84.6
14	VRAJA LIREI	2005	1'24,8	84.8
15	BRENDA	1999	1'24,8	84.8
16	RELAXA	2008	1'24,9	84.9
17	SORANA	2011	1'25,0	85
18	IRENA	2011	1'25,1	85.1
19	ONDA	2007	1'25,2	85.2
20	AMICA III	2007	1'25,2	85.2
21	VENERA	2014	1'25,3	85.3
22	DIACONITA	2005	1'25,4	85.4
23	STEMATA	1998	1'25,5	85.5
24	KIRRA	2016	1'25,6	85.6
25	SULTANA	2009	1'25,7	85.7
26	VRAJA SOU	2003	1'25,8	85.8
27	PAMFILA	2005	1'25,9	85.9
28	REGINA ANA	2003	1'26,0	86
29	ROMANITA	2004	1'26,2	86.2
30	SOLEDAD	2017	1'26,5	86.5
31	SENIORITA	2013	1'26,6	86.6
32	VRAJA STANCA	2012	1'26,6	86.6
33	SARA	2007	1'26,6	86.6
34	OSANDA	2005	1'26,6	86.6
35	OPS	2015	1'26,7	86.7
36	KATRINA	2000	1'26,7	86.7
37	IALTA NU	2001	1'27,0	87
38	KATIUSA	2004	1'27,4	87.4
39	SOGUNA	2000	1'27,4	87.4
40	ASTARTE	2015	1'27,5	87.5
41	CAMILA	1998	1'27,5	87.5
42	VRAJA ZAPEZII	2016	1'28,0	88
43	RAZA DE LUNA	2000	1'28,0	88
44	RAMYA	2017	1'28,2	88.2
45	PANDORA	2015	1'28,2	88.2
46	KINA	2017	1'28,4	88.4
47	REGINA ANTOANETA	2009	1'28,6	88.6
48	SOLOMIA	2001	1'28,7	88.7
49	RECEPTIA	1998	1'28",8	88.8
50	VICTORIA	2009	1'29,8	89.8
51	VIDIA-ROSIE	2016	1'29,9	89.9
52	NEMARA	2017	1'30,7	90.7
53	SOPHIA	2017	1'33,0	93
54	FINUTA	2012	1'33,1	93.1
X			1'26,18	86.18
STDEV				2.58
Sx				0.35
cv %				3.00

By far, the most valuable mare is Nevada, with a record of 1'18"4/km, a value significantly better than that of the stallion Bizar (1'20"9). At the opposite end of the broodmares are the mares Finuța (1'33"1) and Sophia (1'33"), both of which were introduced in the reproductive nucleus of Romanian Trotter due to the low number of broodmares. The performances of the two fillies were recorded at the age of 2 years, and they were classified in class I. In accordance with the standards for the grading and classification of horses, specimens (females only) classified in class I can be included in reproductive nucleus of the breed.

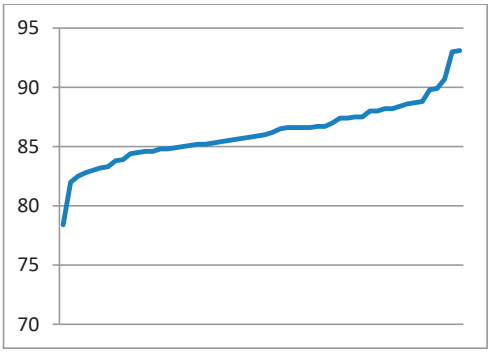


Figure 2. Distribution of values in sire stallions

The average performance of the broodmares was 1'26"18, a performance achieved, in most cases, until the age of 4 years. This average performance places the broodmares of Romanian Trotter in the RECORD class, obtaining a score of 9.

By concatenating the data presented previously, we have made a ranking of the individuals that make up the reproductive nucleus of the breed. Of course, the mare Nevada remained at the top of the ranking, followed by a group of 3 sire stallions (Bizar, Vârtej, Neluțu). The mare

Simetria ranked 5th, followed by 2 other sire stallions (Vis and Nurofen), and the mare Răsfățata. We mention that these three mares mentioned above recorded the performances presented at the age of 4, representing the Dor Marunt National Stud in the Romanian Trotting Derby.



Figure 3. Testing Romanian Trotter at Ploiesti racetrack (original)

The average value of the productive performance, in the reproductive nucleus of Romanian Trotter, was 1'25"77. This value does not differ much from that calculated by Velea et al. (cited by Mărginean et al., 2017), of 1'25"95, presented in Table 5. However, if we take into account that the value of 1'25"95 was calculated for individuals who had reached the age of 4, we should compare the average value of the mares from reproductive nucleus with that calculated by the same author for 3-year-old mares. In this case, we are talking about an evolution of the population through the prism of productive performances.

Table 5. Calculated average performances

Age	Average performance of reproductive nucleus	Sire stallions average performance	Broodmares average performance	Average performances of Romanian Trotter (Velea et al)
	Seconds/km			
3	85.77	82	86.18	89.06
4	85.77	82	86.18	85.95

In the Figures 4 and 5 it is graphically represented the differences between the average performances calculated in this study and those presented by Velea et al., cited by Mărginean et al. in 2017.

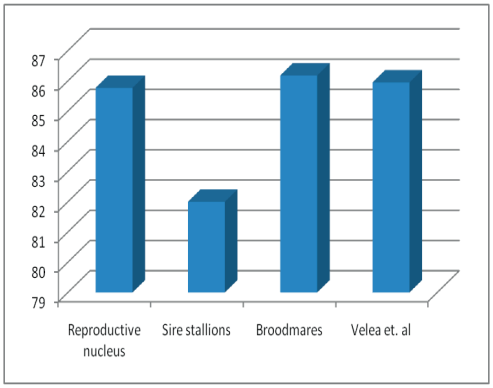


Figure 4. Graphic representation of average performances at 4 years

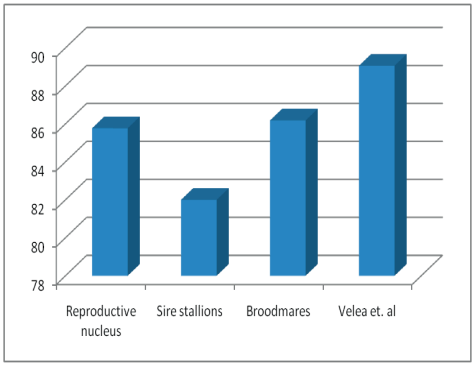


Figure 5. Graphic representation of average performances at 3 years

It is easy to observe the major differences that appear at the age of 3 years.

We must specify that the work of grading and classifying of the Romanian Trotter breed, and not only, takes place at the age of 3 years. In the case of mares, in particular, they are withdrawn from the racetrack when they are promoted to the reproductive nucleus. The idea is to obtain the first products from them as quickly as possible. Practically at the age of 4 years, they are mounted, and at 5 years, they give birth to the first product. It is also a measure to reduce the generation interval and also to improve the age structure (Pruna et al., 2022). Only mares that have recorded outstanding performances, who were generation leaders, are kept on the racetrack until the age of 4 years to participate in the Romanian Trotting Dery. The same thing does not happen with stallions, however, as they can be kept on the racetrack for a longer period of

time. This is the reason why we referred to the research carried out by Velea et al., emphasizing the differences that appear at the age of 3 years.

We must also add that the Romanian Trotter horse was, and is still considered to be, a late trotter, in the sense that it manifests its maximum energetic capacity at an advanced age. The proof is the clearly superior results obtained by individuals belonging to this breed, after the age of 5-6 years. This characteristic probably appeared as a result of the fact that during the communist period it was desired that the specimens withdrawn from the racetrack to be used in agriculture, resorting, at a certain point, to the use of Furioso North - Star and Nonius specimens to increase the size and traction capacity. Fortunately, the situation lasted a very short period of time.

Combining the above, the progress made following the selection work becomes even more important because all this situation does certify the continuous improvement of the productive performance of the Romanian Trotter in the last 3 decades and also the interest shown in increasing the precocity of the breed.

CONCLUSIONS

The situation is quite complex, a complexity given by the action of several factors on our goal, namely to improve the productive performance of the Romanian Trotter horse on the racetrack. And unfortunately, we cannot limit ourselves to technological factors only.

In light of the results obtained, we allow ourselves to formulate the following conclusions and recommendations.

Conclusions

- Due to efficient selection, the productive performances of the Romanian Trotter have been improved in the last 3 decades;
- The performances recorded by the Romanian Trotter, on the racetracks in Romania, are inferior to the other performances recorded by other trotters;
- In the races held by the Romanian Trotter on the racetracks outside Romania, the performances obtained were clearly superior to those recorded in the country;
- Taking into account the fact that the specimens that participated in international races benefited from the same training and the same feeding as in the country, it is clear that the main problem is the racetrack track as well as the way the races are organized and conducted in Romania (the races organized in the country are mostly handicap races);

Recommendations

- Continuing the selection work towards improving productive performance;
- Improving running conditions, and we refer here to the Ploiesti and Mangalia racetracks;
- Decreasing the number of handicap races concomitantly with increasing the number of autostart and group races;
- Introducing handicaps for imported trotters and establishing, for them, scales similar to those in the countries of origin
- Participating as frequently as possible in international races

We would like to point out that, in order to participate in international races, organized in Europe but not only, Romania must become a member of the UET (Union Europeenne du Trot). In this sense, the stud-book authority must develop a breeding programme for Romanian Trotter and a racing regulation that complies with the UET requirements. Unfortunately, neither the former stud-book managers (ACT - Trotting Horse Association) nor the current ones (ANZ - National Agency for Animal Husbandry) nor the main Romanian Trotter breeder (ROMSILVA) have managed to take Romania to the UET. Leaving aside what was, we believe that at this moment ANZ (National Agency for Animal Husbandry), as the keeper of the breed's stud-book, has both the quality and the capacity to take the necessary steps for Romania's integration into the UET. Unfortunately, the situation is stagnant, which can also be interpreted as a lack of interest or lack of professionalism.

ACKNOWLEDGEMENTS

This research work was carried out with the support of National Forest Administration - ROMSILVA R.A. - Horse Breeding and Exploitation Department

REFERENCES

Maftei, M., Ianitchi, D., Pruna, M., & Dronca, D. (2022a). Partial results regarding the genetic determinism of growth process in a native horse breed using wither's height. *Indian Journal of Animal research,* 1 - 3, *DOI: 10.18805/ IJAR.BF-1435*

Maftei, M., Vlad, I., Mărginean, G., & Dronca, D. (2022b). Study on Phenotypic, Genotypic and Environmental Correlations Between the Main Body Dimensions Used in the Selection Process in Horses - *Indian Journal of Animal Research,* 1192-1195, *WOS:000886725000002*

Maftei, M., Marginean, G., Vlad, I., Popa, R., Popa, D., Pogurschi, E., Nistor, L., Ianitchi, D., Suler, A., & Posan, P. (2018). A part of genetic History in horses: important ancestors of Gidran horse from Tulucesti studfarm. *Scientific Papers. Series D. Animal Science, 61*(2), 25-29, WOS:000454345800004.

Marginean, G., Grosu, H., Șonea, A., Popescu – Vifor, S., & Drăgotoiu, D. (2012). *Hippology Treatise.* Bucharest, RO: Academy Romanian Publishing House.

Marginean, G., Georgescu, G., & Maftei, M. (2005). *Practical workbook for horse exploitation.* Bucharest, RO: AgroTehnica Publishing House.

Pruna, M., Maftei, M., Vidu, L., Vlad, I., & Marginean, G. (2022). Partial results of genetic analysis in Romanian Trotter horse from Dor Marunt studfarm - reproductive isolation and age structure. *Scientific Papers. Series D. Animal Science*, *LXV*(1), 94-99. WOS:000834534200012.

Popa, R. (2009). *Breeding programs*. Bucharest, RO: Printech Publishing House, pp. 154–172.

www.anarz.eu. *Criteria for assesment of breeding horses, no. 2 from 16th July 2008.* Retrieved on 14 January, 2025.