



NAČRT ZA
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REPUBLIKA SLOVENIJA
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GOZDARSTVO IN PREHRANO



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NextGenerationEU

Linear description of trotters in Slovenia

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DigŽiv



Digitalizacija podatkovnih zbirk v živinoreji

Digitalization of databases in animal husbandry

Digitalization of databases in animal husbandry



Partners:  Kmetijski inštitut Slovenije  **BF** UNIVERZA V LJUBLJANI
Biotehniška fakulteta  **VF** UNIVERZA V LJUBLJANI
Veterinarska fakulteta

Financing: NextGenerationEU



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History of trotter in Slovenia



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The traditional Slovenian horse breed was developed around 1880 in Ljutomer.

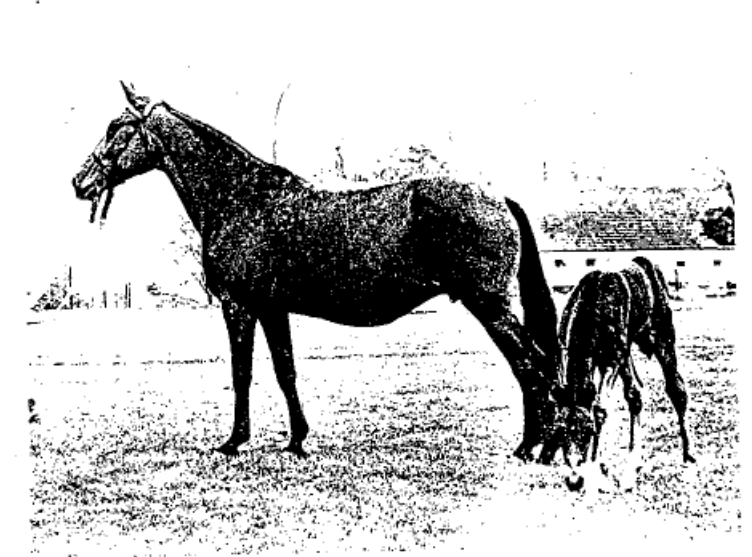
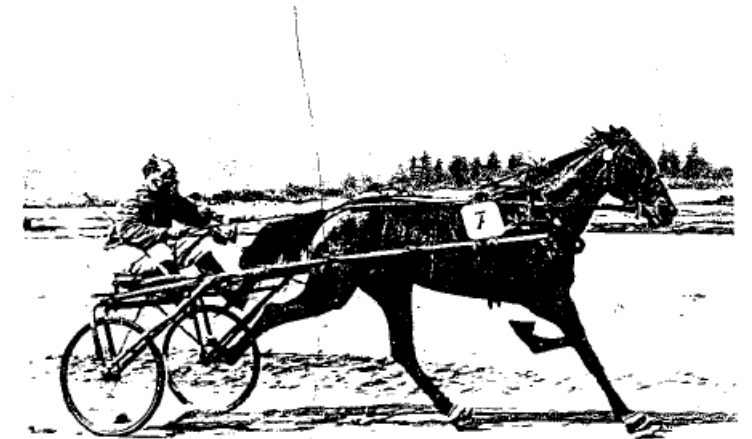
The first races in that area took place in 1875 (on roads), and from 1892 onward at the Cven racetrack.

Trotters from that time were known for their speed and endurance and were used as both working and racing horses.

Mares were bred with the introduction of American and Russian bloodlines, as well as some French lines, to achieve better racing results.

The Yugoslav trotter register has existed since 1919; before that, only limited data were available.

In Ljutomer, 30 mare lines were established, of which 13 still exist today.



VF

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How did the idea of creating a linear scoring scale for trotters come about?



I have been a breeding manager for trotters for 15 years.

I am also an international judge for American Quarter Horses (DQHA), where a linear scoring scale is used.

I have attended several international workshops on linear profiling and recognized the potential to modernize the traditional numerical evaluation system.

The goal was to provide breeders with a better understanding of selection and breeding progress.



Where to Start



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I initially used a linear scoring system for warmblood breeds. However, it was later observed that trotters exhibit distinct characteristics. Their conformation is not homogeneous, and their movement differs significantly. Selection has primarily been based on racing performance. This led me to question whether the trotter population still retains the phenotypic characteristics present at its foundation and whether these traits remain within the same morphological parameters (e.g., withers height, body length, chest girth). Furthermore, I examined how the population has changed over time and whether certain traits may have diminished or been lost, possibly due to the decline in foal numbers (from approximately 180 to 40 per year) and selection focused mainly on racing performance.

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877

Linearni opis		Ekstrem	ABC	DEF	GHI	Ekstrem	
Kondicija/rejno stanje	Zelo suh	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Zelo debel	
Tip splošni vtis	eleganten	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	grob	
Pasemski tip	Malo pasemski	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Zelo pasemski	
Spolni dimorfizem	Slabo izražen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dobro izražen	
mišičnina	slabootna	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Zelo močna	
1 Glava	Ovnova glava	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Krapja glava	
2 Telesna oblika a	dolg	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	kratek	
3 Telesna oblika b	visok	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	nizek	
4 Usmerjenost trupa	Navzgor/pobit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Navzdol/pregrajen	
5 Dolžina vratu	dolg	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	kratek	
6 Pozicija vratu	vertikalna	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	horizontalna	
7 Oblika vratu	usločen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	raven	
8 Viher	Visok/dobroizražen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nizek/slabo izražen	
9 Plečka (kot)	položna	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	strma	
10 Hrbet	raven	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	usločen	
11 Ledje-križ	dolg	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	kratek	
12 Nastava križa	pobit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	raven	
13 Dolžina križa	dolg	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	kratek	
14 Sprednje noge	Telečja stoja	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Klečava stoja	
15 Sprednje noge	razpetne	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	spetne	
16 Sprednje noge	raznožne	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	prinožne	
17 Zadnje noge	sabljaste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Odprti kot	
18 Zadnje noge	razpetne	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	spetne	
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20 gibanje	Nihajoče navzven	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nihajoe navznoter	
21 Kopita	velika	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	majhna	
Gibanje		Ekstrem	ABC	DEF	GHI	Ekstrem	
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23	korektnost	Rotacija, zviranje, nestabilnost	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	korektnost	
24	Hod	zamah malo	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	veliko	
25		elastičnost	Trd statičen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	elastičnost
26	Kas	Pozicija nog v kasu	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Spetne	
27		korektnost	Rotacija, zviranje, nestabilnost	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	prinožne korektnost
28		zamah malo	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	veliko	
29		elastičnost	Trd statičen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	elastičnost
30	ritem	enakomeren	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	riem	
	Karpalni sklepi	Slaba os	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Dobra os	
	Tarzalni sklepi	Slaba os	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Dobra os	



Population assessment

- The population remains within the same morphological parameters

Mesurment/Year	1963	2000	2005	2010	2011–2025
Withers height	153,20±3,98	157,14±4,11	157,89±4,11	154,49±5,10	157,07±4,63
Chest girt	169,40±5,67	181,32±7,01	185,06±6,35	179,42±7,37	182,02±6,95
Cannon bone size	18,38±0,73	19,56±0,85	19,85±0,84	19,00±0,96	19,25±1,07
	Jurkovič	Rus	Rus	Mesarič	Jamnik Cerk



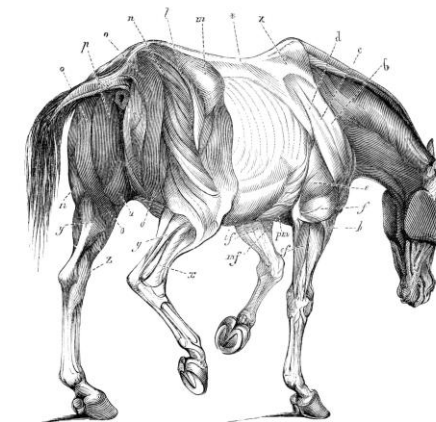
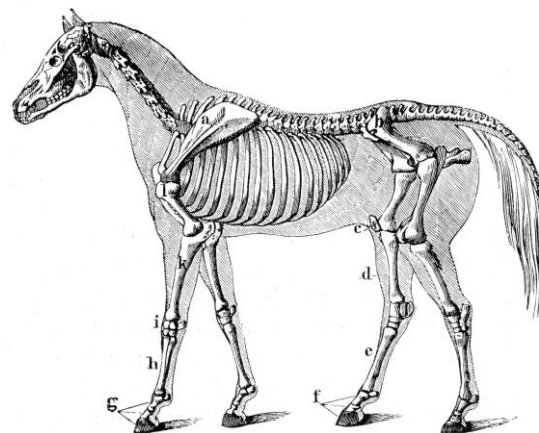
Population assessment

- In addition to standard measurements, additional morphological traits of trotter horses were assessed.



Population assessment

- Through measurements and anatomical evaluation of trotters, key traits for a linear scoring system were identified.
- At the same time, some ideal values for individual traits were established. Some of these can be directly linked to characteristics described at the foundation of the breed.



Traits of trotter linear scoring system



1. Condition
2. Typ
3. Conformation
4. Foundation
5. Conformation front legs
6. Conformation hind legs

7. Race time
8. Evaluation score



Traits of trotter linear scoring system



	A	B	C	D	E	F	G	H	I	J	K	L
25	IV.Foundation/Fundament											
26	foundation /Fundament Ausprägung	weak/schwach								strong-well defined/stark		
27	length cannon bone/Röhrbeinlänge	long/lang								short/kurz		
28	balance/Balance	unbalanced/unbalanciert								balanced/balanciert		
29	pastern bone length /Fesselung	long/lang								short/kurz		
30	fetlock/Fesselstand	sloping/durchtrittig								steep/steil		
31	hoof/Huffform	smal/klein								big/gross		
32	knee line/Karpalgelenke Einschienung	distorted/schlecht eingeschient								good/gut eingeschient		
33	knee definition/Karpalgelenke Ausprägung	weak/schwach								strong/gut ausgeprägt		
34	hock line/Sprunggelenke einschienung	distorted/schlecht eingeschient								good/gut eingeschient		
35	hock definition/Sprunggelenke Ausprägung	weak/schwach								strong/gut ausgeprägt		
36	V.Conformation front legs/Stellung vorne											
37	frontal line	toes out/zeheweit								toes in/zehheneng		
38	knee alignment	wide at the knees/bodenweit								narroe at knees/bodeneng		
39	lateral line	camped under/vorständig								camped out/unterständig		
40	lateral line	buck-kneed/vorbiegig								calf-kneed/rückbiegig		
41	VI.Conformation hind legs/Stellung hinten											
42	hind line	toes out/zeheweit								toes in/zehheneng		
43	hock aligment	wide at the hocks/bodenweit								narroe at hocks/bodeneng		
44	lateral line	camped under/unterständig								camped out/rückständig		
45	lateral line	sickle-shaped/säbelbeinig								open-angled/offen gewinkelt		
46	posterior correctnes	cow-hocked/kuhnessig								bow-hocked/fassbeinig		
47												
48	parrot mouth/owerbite	gebiss unkorectheit										
49	umbilical hernia	Nabel bruch										
50	race time	Rekord/Rennzeit										
51	evaluation score	Bewertungspunkte										
52												

Analysis

- These traits do not involve movement. As trotters exhibit a very specific gait, it was not considered appropriate to include movement-related traits. Instead, performance results achieved in races could be used.



In future work, data from over 100 horses evaluated using this scale will be analysed. The scale will be compared with conventional evaluation score obtained by this horses.

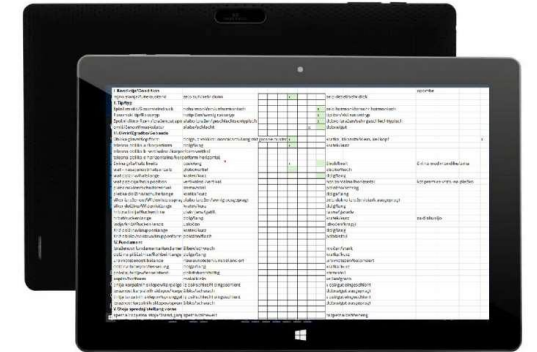
Racing performance, based on achieved race times, will also be assessed.

Additionally, stride length could be assessed using an extensive collection of race recordings. Parameters of this kind have been documented in the literature since the previous century.

Project connection

Within the framework of the project **NOO Digitalization of databases in animal husbandry**, one of the objectives is the modernization of evaluation models, under which the development of this linear scoring model has also been ongoing over the past three years.

As part of the project also a digital application for linear scoring is being developed to replace paper-based field recording with a modern tablet-based system.



Digitalization of databases in animal husbandry



Finally, I would like to express my sincere gratitude to my colleague, Britta Schielke, for her expertise and time, and for our collaboration in developing and exploring the linear scoring system for trotters.

Find us on-line

