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From phenotypic to genetic linear profiles



6th international Workshop on linear Profiling in the Warmblood Horse



Inge Workel

25th March 2020

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Linear Profiling

Linear profiling of conformation and performance traits is done at:

- Foal shows
- Studbook registrations
- Mare performance tests
- (pre-)Licensings for stallions

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Linear Profiling





- Start in 2012, with a Tablet
- 186 traits in total, we only document the obvious traits




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Linear Profiling




Assessment:


1. Format and front
2. Top line
3. Conformation
4. Correctness of gaits and coordination
5. Moving in hand
6. Free movement
7. Movement while ridden/on a lunge

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Linear Profiling

 data sheet

 conformation

RING

ASSESSED

UELN DE 433330139412

☐ don't publish

head number 199studbook 33

format and front part

topline

limbs


correctness / coordination

movement in hand


free movement


movement under rider/on the lunge

group	area	- extreme	-3	-2	-1	0	1	2	3	+ extreme
FORMAT	Breed type	plain								true to type
	Gender expression	weak								strong
	Frame	small-framed								large-framed
	Caliber	light								heavy
	Chest width	narrow								wide
	Barrel	shallow (tucked-up)								deep
	Umbilical thickening									marked umbilical thickening
	Condition	skinny								fat
	Development	poor								much
	Length of legs	short-legged								long-legged
	Harmony of proportions	unharmonious								harmonious




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Data collection

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Data collection



Collected linear profiles:

>24.000 linear profiles in total (2012 – 2019):

15.000 linear profiles of foals

- Ø2.200 foal profiles/year
- collected at about 90 foal shows (GER & EU)

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Data collection


Collected linear profiles:

>24.000 linear profiles in total (2012 – 2019):

9.000 linear profiles of adult horses

- Ø1.300 adult horse profiles/year

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Mare performance test: Ø 30 traits



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3	2	1	0	1	2	3
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Linear Profiling in practice

individual presentation

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Linear Profiling in practice

walking ring


A photograph of a brown horse walking in a ring during a presentation. The horse is in the foreground, moving from left to right. In the background, there are other horses and people in a fenced area with trees and a white tent.

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Linear Profiling in practice

walking ring



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Linear Profiling in practice

judging team



Team:

1 Main Judge
(from the breeding society)



2 Volunteer judges

1 Assistant for linear profiling






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Linear Profiling in practice


judging team 


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Linear Profiling in practice


Judging team 

Judging foals goes very fast



Linear profiling can only succeed if:

1. The main judge knows the traits by heart and is very clear in dictating or:
2. The assistant is experienced in judging as well

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Linear Profiling in practice

Judging team

Judging foals goes very fast

In small foal shows, the main judge has to do linear profiling without assistant

Multitasking is asked



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Linear Profiling in practice

Examples – foal video

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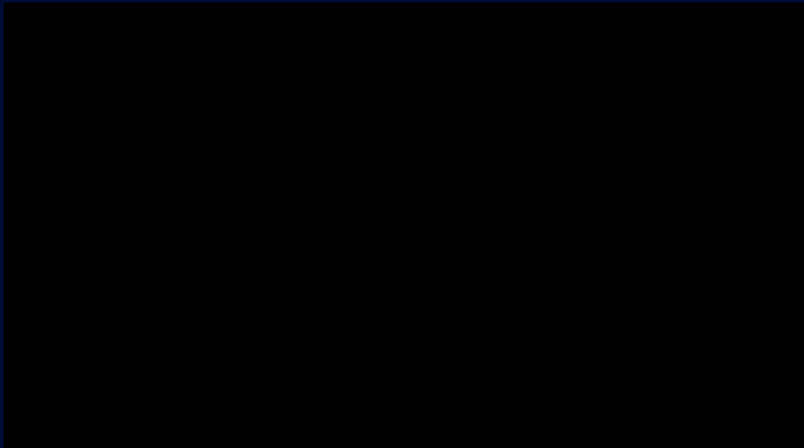
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Linear Profiling in practice

Examples – foal video



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TROT Freedom of shoulders	short		1	long
TROT Impulsion	weak		1	powerful
TROT Carrying power	pushing		2	carrying
TROT Suppleness	tense		1	supple

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Organisation!

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Linear Profiling in practice

concerns


Possible overestimation of traits that might be more visible in foals as in adults horses:


Withers: flat/high

Pasterns:

- Length: short/long)
- stance: - (upright/sloping, weak)
 - toe-in /toe-out

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Linear Profiling in practice

concerns


Therefore we have to follow the correlations of linear traits between foals and adult horses in a critical way, for each trait.

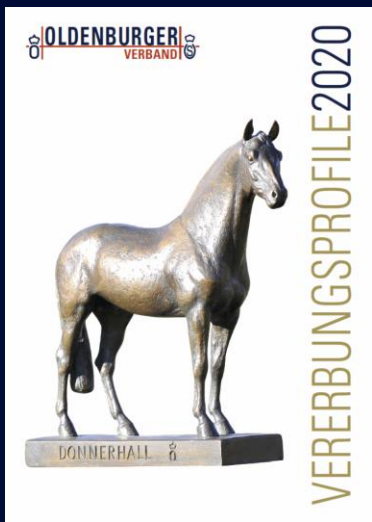
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Genetic profiles






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Genetic profiles: Background




Traits:

- 46 linear traits
- Heritability of $h^2 > 10\%$

Influencing factors:

- Judge / assistance
- Society (jumping, dressage)
- Age
- Sex

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Gaits

