



IT-Solutions for Animal Production



2nd International Workshop on Linear Profiling in the Warmblood Horse on February 11-12, 2016, in Warendorf / Germany

Horse Commission of the European Federation of Animal Science (EAAP), Interstallion Working Group



IT-Solutions for Animal Production

WBSFH Annual Meeting (General Assembly & Seminar) on 18-20 October 2015 in Vienna / Austria



Report from the EAAP: 66th EAAP Annual Meeting and activities of the EAAP Horse Commission

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Linear profiling activities & the EAAP Horse Commission: exchange of experiences and community support to overcome the challenges of implementing linear description

■ chronology:

- 15 Dec 2011 workshop on linear profiling (overview of recording systems) in Arlanda / Sweden, formation of the linear profiling working group
- 23 Apr 2012 practical workshop in Dublin / Ireland
- 29 Aug 2012 meeting of the linear profiling WG in Bratislava / Slovakia
- 21 Jan 2013 mobile system demonstration mobile in Hanover / Germany
- 28 Nov 2013 workshop on linear profiling (theory, practice) in Vechta / Germany
- spring 2016 workshop on breeding use of linear trait information

■ publications on linear profiling and its perspectives

- presentations (nationally and internationally; e.g. WBSFH, 7 Oct 2013, Warsaw)
- publications (scientific review article, website with linear trait inventory etc.)

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Phenotype recording

Horse breeding is characterized by an extremely wide spectrum of traits to be considered when making breeding decisions (this issue is addressed in more detail in the section trait groups). The descriptions of the breeding goals provide some hints for horse owners, riders and breeders where to focus. However, when it comes to specific aspects, it is often not easy to find clear directives on the basis of the available trait definitions and the accessible trait information (phenotypes or breeding values). Experiences with the new traits (for example from the trait groups health and behavior) are still limited, and we are also not rarely challenged by the long-established conformation and performance traits.

Linear descriptions of traits relative to biological extremes have the clear advantage of independence from breeding goals. There are many examples for successful use of linear traits in animal breeding, and more recently the importance of linear systems for horses have increased, too. They are referred to as **linear scoring** or – in order to avoid confusion and misinterpretation with the valuating scoring – **linear profiling**. Instead of expressing how bad or good some phenotype is relative to a theoretical optimum (valuating score), the linear value reflects the proximity of the phenotype to the most extreme expressions. For example, the length of the neck of a horse can be described between extremely short and extremely long – without any consideration of which neck length would probably fit the breeding goal best. The second beneficial change in linear systems is the refinement of trait definitions, being linked to the departure from the reference to more globally defined breeding goals. This more objective and more detailed information of linear profiles provides transparency of the assessments of horses that cannot be achieved in the traditional system of valuating scoring.

A judge may tend to give a lower (= worse) valuating score for trot because of over-excited knee action or because of lacking thrust or hind limb activity. In the linear system, distinct linear values are assigned to the different aspects of trot which are relevant for the breeder and rider. Accordingly, it is clearly documented which horse showed extreme knee action or inactive hind limbs.

The revision process of the assessment of conformation and performance traits in horses has begun in several countries, and the change to more detailed and more objective documentation will surely proceed. The advantages of linear profiling have been recognized by several studbooks, and innovative approaches like electronic recording using mobile devices can help overcoming the challenges of implementing the new system. To support interested studbooks in their development towards improved phenotyping, further information on linear profiling can be found in publications; details regarding the linear systems used in the praxis are provided in the overview and in the information material of the individuals studbooks provided below.

Inventory of linear traits (EXCEL file)

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Journal of Equine Veterinary Science 34 (2014) 360–368

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Journal of Equine Veterinary Science

journal homepage: www.j-evs.com

Review Article

Implementation and Prospects of Linear Profiling in the Warmblood Horse

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SUMMARY Theory parts I & II



- overview of routine applications and ongoing research
- feasibility of routine linear profiling in the Warmblood horse
 - independent of age
(different approaches for foals, mares, stallions, young horses)
 - conformation and performance phenotypes including behavior
(according to assessment conditions and intentions of linear profiling)
- parallel move towards linear profiling in several studbooks implying
 - mutual benefits from synergistic actions
 - motivation for exchange of information and experiences
 - required transparency with regard to linear schemes and trait definitions

SUMMARY Theory parts I & II (cont.)



- challenges of and solutions for implementation
 - recording:
linear scheme, recording system, assessors
 - analysis of linear data:
data screening, interpretation of distributions, selection of traits for genetic analyses
 - delivery of output:
individual linear profiles, progeny statistics,
genetic profiles / breeding values for linear traits
 - breeding use of linear data:
support of breeders and studbooks, improvement of breeding programs

Points of discussion



- use of different linear schemes
 - Do we need more harmonization (e.g. standard set of traits) to get comparable data?
 - Do we achieve enough transparency and standardization of linear profiling by publishing internationally used linear traits and trait definitions (online accessible linear traits inventory)? How to keep it update?
 - What are possible options to improve knowledge transfer, transparency, and standardization of linear profiling?
 - How to ensure efficient development to the benefit of all?
- training of linear profiling
 - How to improve the 'quality offense' of phenotyping (data quality issues)?
 - How to optimize support of the shift to linear profiling in the studbooks? Do workshops following science-to-practice approach help (scientists and studbooks/judges)?
 - What about across-country/studbook exchange of certified judges (possible future WBFSh initiative)?



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