Systematization of recording and use of equine health data and its potential for horse breeding

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Background: demands

- increased demands of sustainable and balanced breeding programs
  - performance
  - health, welfare and longevity
- new traits as factors of competitiveness among studbooks
  \(\rightarrow\) relevance of health as breeding goal \(\uparrow\)
Background: demands & status quo

- increased demands of sustainable and balanced breeding programs
  - performance
  - health, welfare and longevity

- new traits as factors of competitiveness among studbooks
  → relevance of **health** as breeding goal ↑

- **breeding measures to improve health** in German riding horses
  - mainly indirect selection (indicator traits: conformation, performance)
  - some direct selection (extreme phenotypes / stallions)

- legal framework
  - animal breeding act (national)
  - breeding organization directive of the German FN (national)
  - regulations of the breeding societies (N=16 for riding horses)

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Interdisciplinary national initiative

- **aim**: improved information basis on equine health
  - epidemiological figures
  - genetic parameters, breeding strategies
  → comprehensive approach to improving the health of horses

- research consortium
  - veterinarians
  - German studbooks, German FN
  - universities, IT service providers

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Recent developments towards improved consideration of health in horse breeding in Germany:

- **since 2011**: inclusion of defects traits and indications of disease in linear profiling protocols (Oldenburg, Holstein)
- **2012-2013**: harmonization initiative of studbooks and veterinarians: health requirements for stallions (riding horses)
- **2013 / 2014**: "equine health project" as national initiative: joint efforts, shared costs and support by private research foundation (all studbooks)
- **2014**: adjustment of regulations of studbooks: role of health in horse breeding; 'central equine health data base'
Sources of information

- options for health data collection
  - owners and breeders (✓) difficult!
  - veterinary practitioners ✓ first choice (quality, quantity)
  - non-veterinary professionals (✓) possible?!

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Fig.: Schematic of information flow on some health condition of a horse.

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Sources of information

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- requirements for using veterinary health data *
  - agreement with special needs of the veterinary profession
    legally: highly restrictive regarding data usage (conscious agreement of owners),
    practically: user-friendly implementation compatible with daily routines
  - highest standards regarding data security, data privacy, data protection
    highly restrictive regulations regarding data access
  - intense involvement of veterinary experts in R&D
    appropriate handling / processing of the data,
    interpretation and use of the results of health data analyses

* for general overview (stakeholders in the equine sectors), see Hartig et al. 2013a,b
Veterinary health data

- need for systematization and harmonization of recording

<table>
<thead>
<tr>
<th>Data characteristics</th>
<th>AT PRESENT</th>
<th>.supposed to be</th>
</tr>
</thead>
<tbody>
<tr>
<td>general content</td>
<td>routine documentation of work in daily practice (screening, prophylaxis, therapy)</td>
<td></td>
</tr>
<tr>
<td>specific content</td>
<td>heterogeneous in form (mostly free text) and detailedness (context-dependent)</td>
<td>standardized (uniform nomenclature, unambiguous code, clear hierarchy)</td>
</tr>
<tr>
<td>storage</td>
<td>decentralized and heterogeneous (paper forms; practice software)</td>
<td>central and uniform (equine health data base)</td>
</tr>
<tr>
<td>use</td>
<td>at most within-practice statistics (vertical), on-request possible support of veterinary research</td>
<td>population-wide statistics (vertical, horizontal), optimum support of research and routines</td>
</tr>
</tbody>
</table>

- comprehensive recording standard for equine health data
  - tool for standardized and simplified (!) recording
  - uniform coding as base requirement for data centralization
Recording standard

- **requirements**
  - clear distinction between diseases (diagnoses) and findings of disease = direct outcome of examinations
  - unambiguous definitions of all health items to be recorded
  - unambiguous coding
  - praxis-oriented spectrum of recording options

- **realization**
  - distinct sections for diagnoses, radiographic and clinical findings
  - hierarchical structure
  - comprehensive reference
    - all organ systems
    - inherited and acquired conditions
    - descriptive and etiological aspects

Central equine health data base

- reliable logistics
- long-term perspective
  - system extension
  - use of health data (research, routines)
- consideration of needs of all stakeholders
Key factors of success: data flow

- **veterinarians**
  - general acceptance of the recording standard
    - science-driven development with consultation of experts (spectrum of diagnoses and findings, terminology)
  - compliance to the standardized recording
    - smart applications in veterinary practice software ensuring
      - ease of documentation (time, clearness),
      - flexibility (extent / detailedness of documentation),
      - coverage (appropriate documentation options, minimum of free text),
      - compatibility with documentation routines in the veterinary practice

- **horse owners and breeders**
  - understanding of aims and scope
  - trust in the whole system

Key factors of success: data usage

- **breeding organizations**
  - acceptance of necessary restrictions of data access (phenotypes)
  - support of measures to improve data quality
    - accessibility of selected studbook data for participating veterinarians
      (base data to facilitate correct identification of horses)

- **steering committee of the interdisciplinary research consortium**
  - information policy
  - possible system extensions
    - stronger / more direct involvement of 'the practice' (breeders, owners),
    - information on potential influences of the individual health status of horses
  - strategic planning (R&D, routine applications)
Conclusions & prospects

- trustful and constructive collaboration of project partners
  - veterinarians of breeding societies as important drivers
  - strong support from the whole German horse breeding sector
    → installation of the central equine health data base
  - mediators between veterinary practitioners, science and breeding

- base work for future health data collection and analyses
  - regulation of conditions of routine use of equine health data
    (data security issues, regulations of breeding societies)
  - generation of mutual benefits of standardized health data recording
    veterinary practice, studbooks and their clients; test phase with pilot veterinary practices

**Systematization of recording and use of equine health data as first step towards sustainable and targeted health improvement via inclusion of direct health traits in future breeding programs of horses**

Equine health data (STOCK et al.), 28 Aug 2014, EAAP Copenhagen / DK

Thank you!

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