International horse breeding – where are we heading

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21.11.2014
The role of the horse – in the past and today

• Pulling power (agriculture, logging, transportation, military use)
• Carrying people or load (travelling, military, express)
• Meat, milk, skin
• Racing and sports disciplines
• Hobby, tourism, leisure
• Horse assistant therapy
• Animal and nature diversity
Breeding aims in the course of the time; towards goal-directed breeding

- Conformation (long traditions in horse breeding)
- Performance (pulling, carrying, sport disciplines)
- Health, soundness
- Temper/character, rideability, easiness to handle
The horse of today

• Athletic horses; race horses, trotters, riding horses, Icelandic horses and other gaited horses
• Performance according to the discipline; speed, movements, jumping capacity, temper, gaits/movements

Differentiation of disciplines in riding horses in breeding evaluation (dressage, show jumping, three day event ...
• Soundness, health and longevity have risen to be more and more important in all breeds
  - horses are expensive animals
  - breaking and training are expensive
  - veterinary costs are high
  - locomotion problems and lameness are the most common reasons for short careers and culling
- lot of heritable diseases and weaknesses
- how to measure/record health traits:
- 7-11% of the variations in soundness of trotters and riding horses can be explained by conformation (e.g. Magnusson & Thafvelin, 1989; Holmström & Philipsson, 1993)
• Precocity (early starters) is favoured; different aims among breeders and owners (and breeds/disciplines)
  - early starting produces longer careers and better economy of horse keeping
• Horses are kept more or less professionally
The future horse – “New horse economy”

• New uses of horses: therapy, tourism, leisure, pasturing/keeping diversity, companion
• Most horses are owned and used by people with smaller skills; lack of horsemanship and natural animal-human relationship
• Already today, only 5% of riding horses are sold to competition purposes; only 1% to professional riders
• Thus, what will be the most important markets of the horses?
• And what will be the most important aims of horse breeding?
• Important to put more weight on the character/temper of the horse; horses should be easy to handle (not too reactive and sensitive); heritabilities 0.07-0.27 (e.g. Wallin et al., 2003; Suontama et al. 2012; Mantovani et al., 2010)
• To avoid bad character, stereotypes and behavior problems (having genetic background, e.g. Hemman et al. 2014).

• Same time also good health as a breeding goal is getting more weight: orthopedic status ($h^2$ 0.06-0.14 Wallin et al., 2003; Jönsson et al., 2013), insect byte sensitivity (0.05-0.14 Schurink et al., 2010; Grandinson et al., 2006); body condition score (0.37-0.44 Schurink et al., 2010; Mantovani et al., 2010)
• As a modern tool, *genomic selection* will be applied in health breeding
  - regarding traits of low heritability, genomic information can provide a tool for well-founded selection decisions early in life (Haberland et al., 2012)

• ... and *nutrigenomics* can find altering feeds to help horses with genetic diseases
• Some horse owners may also want to put more weight on aesthetic traits and colour and markings (value of the horse)
France: Scenarios of horse sector

(Jez et al. 2013)

• Everyone on horseback (1)
• The high society horse (2)
• The civic horse (3)
• The companion horse (4)
1. Everyone on horseback

- Horses are used for recreational activities
- Strong segmentation between leisure activities/sports/racing
- Breeding of horses on grassland areas in rural areas
- Population +++
2. The high society horse

• Specialization in high-performing sports/racing horses
• The horse is a sign of distinction
• Less horse activities on rural areas
• Population - - -
3. The civic horse

- The horse encourages social contacts and plays role in community building
- Horses are bred and used for different and specific uses
- Activities are strongly developed on projects, local cultures
- Preservation of local breeds, use of horses for various purposes
- Population +
4. The companion horse

- emotional relationship comes first
- Breeding based on “personal feelings” driven e.g. by aesthetic characters, temperament etc.
- Horses distributed to rural and peri-urban areas
- Preservation of breeds
- Population -
Result:

• Horse economy that focuses on horse sports/racing and breeding of sport horses leads to increased number of horses (smaller population size), decreased the horse industry and the impact of horse sector in the society (Scenario 2)

• Horse economy that contributes new horse economy and multipurpose use of horses leads to increased horse industry and increased impact of horse sector in the society
Horse breeding is global – are we ready

• Horse breeding is international and global, because markets are global
• This means global and common aims and goals
• But are horse breeders aware of this?
• There are still lot of national stud books and evaluation systems of “the global breeds”
• Breeding evaluation should be common and based on common rules and aims
• What about native/national breeds: responsibility of breeding; avoiding of inbreeding in small populations; health and soundness in close breeding of relatives (crossbreeding?)