Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Opportunities for joint genetic evaluations of Danish and Swedish sport horses

Viklund[1], Å., Furre[2], S., Vangen[2], O. and Philipsson[1], J.

[1]Swedish University of Agricultural Sciences, Department of Animal Breeding and Genetics

[2]Norwegian University of Life Sciences, Department of Animal and Aquacultural Sciences

Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Opportunities for joint genetic evaluations of Nordic sport horses

Viklund[1], Å., Furre[2], S., Vangen[2], O. and Philipsson[1], J.

[1]Swedish University of Agricultural Sciences, Department of Animal Breeding and Genetics

[2]Norwegian University of Life Sciences, Department of Animal and Aquacultural Sciences

Aim of this study

Joint Nordic genetic evaluation of competition performance with use of raw data from each country by studying:

- Genetic connectedness between the different populations
- Genetic correlation between traits in the different countries
- Defining data and models for genetic evaluation

Competition performance

- Definition: lifetime accumulated points in each discipline transformed with 10-log
- Points reflect:
  - Placing
  - Level of competition
- Data editing:
  - Adding points to horses with placings (NOR)
  - Exclusion of zeros

Competition data

Trait	N	Mean	SD
Show jumping			
SWE	22992	1.42	0.67
DEN	15141	1.57	0.75
NOR	3094	1.47	0.53
FIN	3376	1.31	0.67
Dressage			
SWE	10768	1.38	0.67
DEN	14608	1.38	0.67
NOR	1873	1.27	0.52
FIN	2112	1.26	0.63

Pedigree data

- 229 163 horses in joint pedigree
- Pedigree Completeness Index

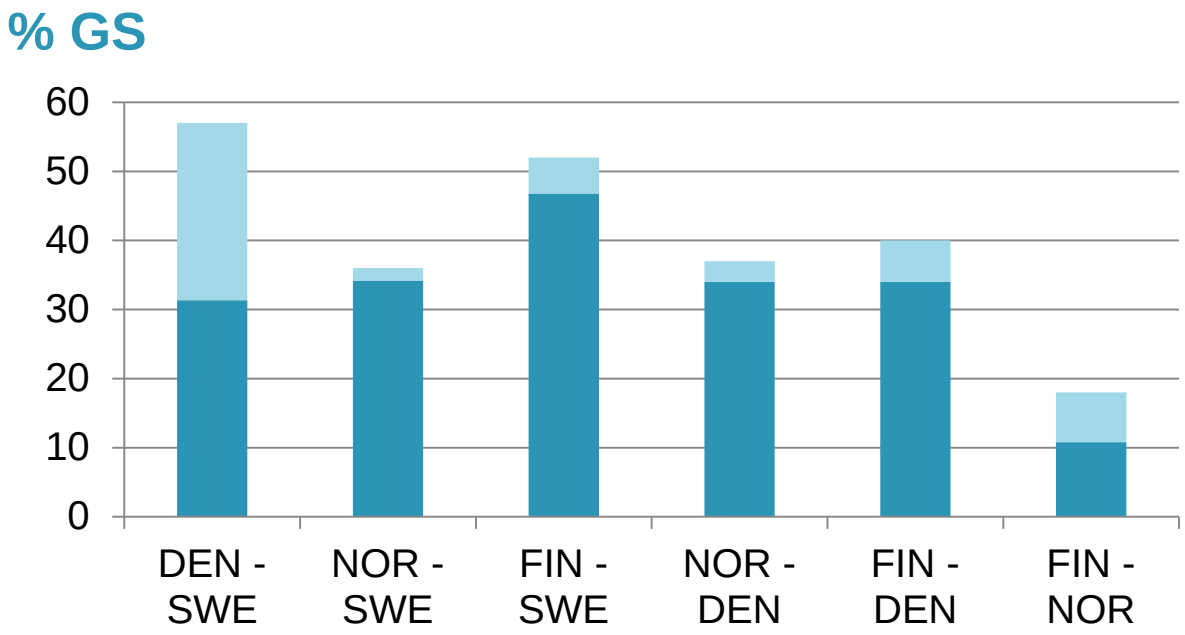
Country	PEC
SWE	0.90
DEN	0.67
NOR	0.27
FIN	0.84

Common sires of competing horses

Competing offspring in:	No of sires
4 countries	164
3 countries	408
2 countries	768

Genetic similarity

’Proportion of competing progenies by stallions having competing progenies in two countries, relative to the total number of competing progenies in both countries’



Statistical models

Univariate analyses within, and bivariate analyses between countries

$$y_{ijk} = \text{birth year} + sex_j + horse_k + e_{ijk}$$

Univariate analysis total data

$$y_{ijk} = \text{birth year*country} + sex_j + horse_k + e_{ijk}$$

Heritabilities

Country	Show jumping	Dressage
SWE	0.32	0.19
DEN	0.25	0.14
NOR	0.31	0.55
FIN	0.42	0.42
SWE-DEN-NOR-FIN	0.27	0.15

Genetic correlations

Countries	Show jumping	Dressage
SWE – DEN	0.99	0.98
SWE – NOR	0.98	0.99*
SWE – FIN	0.82	0.63
DEN – NOR	0.73	0.99*
DEN – FIN	0.78	0.99*
NOR - FIN	0.95	0.99*

* Lower convergence criteria

Re-ranking of stallions – show jumping

			No of competing offspring in				
Sire	Rank SWE	Rank All	SWE	DEN	NOR	FIN	Total
A	1	2	21	40	1	15	75
B	2	8	6	16	0	2	24
C	3	4	17	34	0	1	49
D	4	6	62	2	2	16	80
E	5	5	591	9	5	18	607
F	6	7	299	4	3	2	305
G	7	13	47	125	3	0	167
H	8	9	285	6	5	8	296
I	9	1	2	14	0	3	17
J	10	53	16	38	3	10	67

Conclusions

- Joint Nordic genetic evaluation for competition data is feasible
- More stallions will get earlier and more accurate breeding values
- Additional studies are required
  - genetic connectedness
  - find an optimal model for joint genetic evaluation

Acknowledgements

STIFTELSEN HÄSTFORSKNING

Swedish-Norwegian Foundation for Equine Research