

ANALYSIS OF INBREEDING AND GENERATION INTERVAL OF SILESIAN NORIKER AND CZECH-MORAVIAN BELGIAN HORSE

Čapková Z., Majzlík I., Vostrý, L. and Andrejsová L.
Czech University of Life Sciences Prague, Czech Republic
contact address: capkova@af.czu.cz

INTRODUCTION

Czech–Moravian Belgian (CMB) horse and Silesian Noriker (SN) are the only genetic resources of draught-horse breeds in the Czech Republic. These populations are raised during last 120 years on the imported horses from Belgium, Austria or Bavaria in specific conditions of Czech and Moravia (Silesia) districts.



OBJECTIVE

The aim of this analysis is to estimate the level of inbreeding, generation interval and effective population size as an information for next breeding plans in breeds under study.

MATERIAL AND METHODS

- The paper is analysing the data of horses born in 1990 – 2007.
- The population under study consist of 917 heads of SN (322 stallions, 595 mares) and 2 323 heads of CMB (801 stallions, 1 522 mares).
- Coefficients of inbreeding were estimated on information from full pedigree (Wright 1922) using inbreed procedure of SAS (2008).
- The increment of inbreeding was calculated according Falconer and Mackay (1996), generation interval (Sørensen et al. 2005), effective population size (Nomura, 1996).



Tab. 1: Coefficients of inbreeding

| | F _x for population | F _x for stallions | F _x for mares |
|------------------------------|-------------------------------|------------------------------|--------------------------|
| Czech-Moravian Belgian horse | 2.88 % | 3.21 % | 2.82 % |
| Silesian Noriker | 3.39 % | 3.55 % | 3.38 % |

- During the period under study the rate of inbreeding increased from 2.23 % to 4.06 % in population of SN, and from 1.93 % to 4.16 % in population of CMB respectively.
- The trends of rising rate of inbreeding is remarkable in both sexes
- The increment of rate of inbreeding (ΔF) is estimated for SN as 1.03 % and 0.83 % for CMB respectively.
- The values of generation interval is estimated by value 7.8 years for SN and 8.1 years for CMB.
- The estimated effective population size reached value 95.7 for SN and 110.5 for CMB respectively.

CONCLUSION

- Population of draught horse breeds Silesian Noriker and Czech–Moravian Belgian horse are as a small population threatened by rising rate of inbreeding approx. 1% per generation.
- The genetic variability could be lost particularly in subpopulation of genetic resource in both breeds.
- Minimising the rate of inbreeding in small population under study means to introduce appropriate systems of mating for small population.