61st Annual Meeting of the European Association for Animal Products. Heraklion, Crete Island, Greece , 23rd - 27th August 2010

Changes in the Lithuanian Heavy Draught horse population after the introduction foreign stallions

Rūta Šveistienė

Institute of Animal Science of LVA, R. Žebenkos 12, LT-82317 Baisogala, Radviliškis distr., Lithuania, e-mail: ruta@lgi.lt

Lithuanian heavy draft horses are recognized as breed under preservation.

Introduction

The Lithuanian Heavy Draught Horse breed was developed at the end of 19th century by crossbreeding local mares with Belgian and Sweden Ardenen stallions. Ardennes brought from Sweden had the biggest impact on the formation of the breed. The genealogical analysis of Lithuanian Heavy Draught stallion progeny indicated that there might be found four stallions lines. The condition of these animals does not satisfy the horse breeders. Therefore Lithuanian Heavy Horse Breeders' Association, in 1998 and 2000, brought Ardennes stallions to Lithuania from Sweden.

Objective

The aim of our investigation was to evaluate the changes in the population after introduction foreign stallions chosen for the development of the breed in order to stop the disappearing of the genealogical structure of the Lithuanian Heavy Draught breed.

The method of our study was to determine the genetic diversity within the breed, as well as genetic differences and genetic variation between Lithuanian Heavy Draught population structural units by the method of blood group and protein polymorphism investigation.

Material and methods

The method of our study was to determine the genetic diversity within the breed, as well as genetic differences and genetic variation between LHD population structural units by the method of blood group and protein polymorphism investigation. The pedigree, exterior measurements and blood samples were collected from 439 horses. Lithuanian Heavy Draught (LHD) horses were classified in to four groups. Group 1 composes progeny from stallion Flatentas, Group 2 - from stallion Tervo, Group 3 – stallion Boysen of Sweedish Ardennen breed. Group 4 – offspring's of purebred LHD.

Results

Phenotypic differences of lines or groups reflect their genetic diversity. The influences of foreign breed in to the conservation programme lead to changes in to the genetic variation of a breed.

Fig. 1. The numbers of foals of the purebred LHD and Swedish Ardennes stallions in 1991-2009.

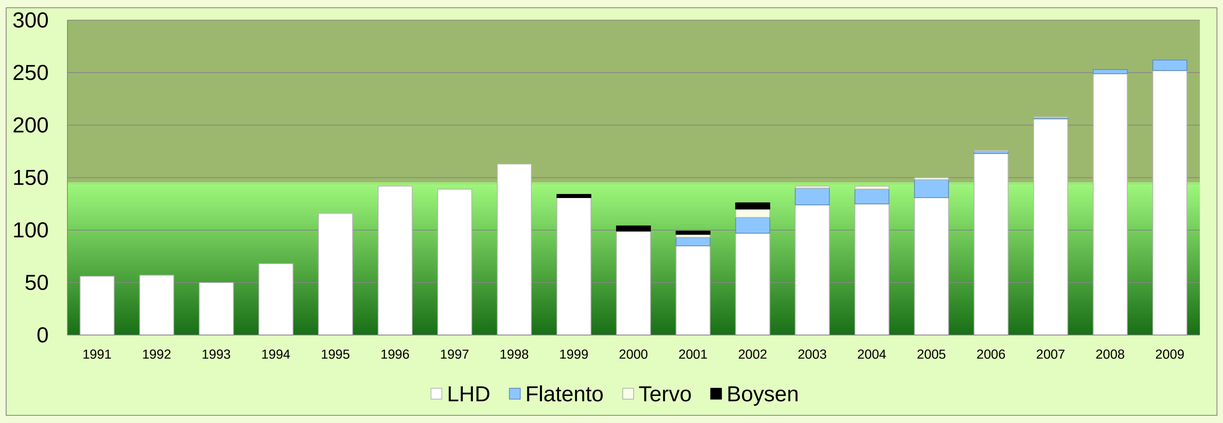
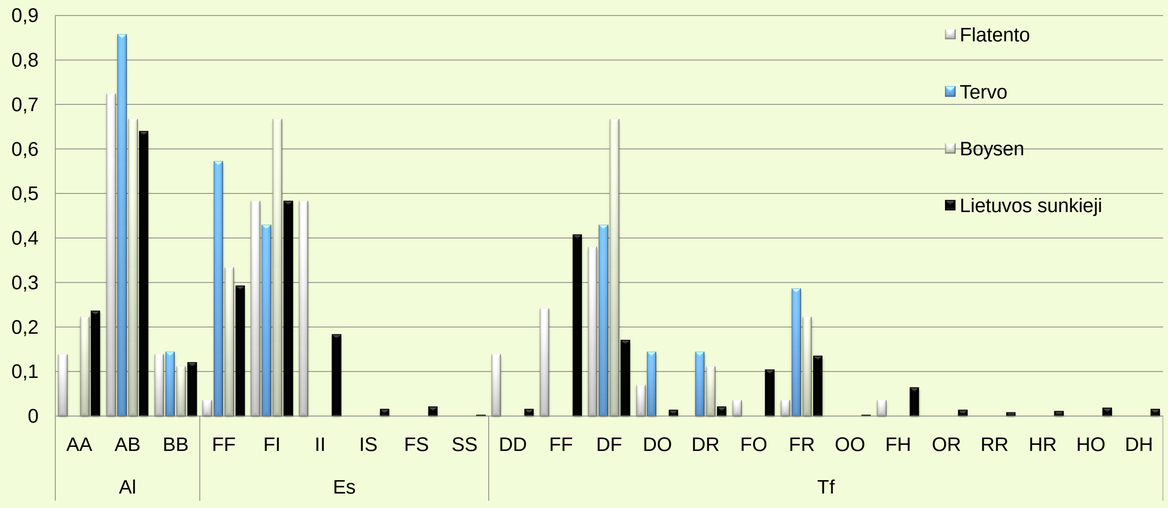


Table 1. Evaluation of the exterior in different groups of LHD mares

Ggoup	Withers height	Chest girth	Cannon bone girth	Origin	Exsterior	Tipe	Body measurement	Character	Muvement
Flatentas	161.2	211.2	24.4	8	26.5	17	9.5	8	15
Tervo	159	206	22.7	7	26	15.5	8	8	15
Boysen	158	219	24.7	7,5	22.2	14.5	7.5	7.5	15
Purebred LHD	161.6	208	23.2	9	25.6	17	9	8.5	14.5

Fig. 2. Analysis of protein polymorphism in the different LHD horse genotypes.



Phenotypic differences of lines or groups reflect their genetic diversity.

Offspring of the stallion Flatentas are characterized by a typical body constitution to the LHD breeding horses.

The stallion Boysen pass its exterior traits to the offspring very well, but its traits are not typical for LHD. The influences of foreign breed in to the conservation programme lead to changes in to the genetic variation of a breed.

According to our data the highest genetic similarity was determined between the offspring's of stallion Flatentas and purebred LHD population and the lowest between the offspring's of Boysen and LHD population. Therefore immigration level of Swedish Ardennes horse genes is more useful from the stallion Flatentas.

Table 2. Common Genetic distance (r) between different genotypes of LHD horses). Above diagonal – blood groups, below diagonal – protein polymorphism

Groups	Purebred LHD	Boisen	Tervo	Flatentas
Flatentas	0,8164	0,8015	0,7641	-
Tervo	0,7131	0,8495	-	0,2855
Boysen	0,7385	-	0,6139	0,2715
Purebred LHD	-	0,4068	0,2738	0,6258

Conclusions

- The influence of selected foreign stallions on LHD population was defined unlike.
- The stallion Flatentas of Swedish Ardennes breed is characterized as most genetically (r=0,5109) and phenotypically suitable to extend genealogical structure of LHD population.
- The influence of selected stallion Flatentas on population genetic diversity was detected low and helps to improve some phenotypic traits of purebred LHD. Therefore we are recommended to use crossbreed offspring of stallion Flatentas on the conservation programme. But the proportion of foreign genes which are introduced in to the population can not be more than 10%.

Fig.3. The offspring's of Flatentas group are of a desirable type and body conformation. The selected typical half-bred stallions will be included in the general programme for Lithuanian Heavy Draught horse breeding.

EUROPOS ŽEMĖS ŪKIO FONDAS KAIMO PLĖTRAI: EUROPA INVESTUOJA Į KAIMO VIETOVES

PROJEKTĄ REMIA LIETUVOS RESPUBLIKA

Lietuvos kaimo tinklas LKT