

The annual statistics of foaling rates in Finland showed a declining trend through 1991 - 2005. The preliminary results for possible reasons for two breeds (Finnhorse and Standardbred) are presented.

## Declining foaling rates in trotters in Finland



Photo: Taina Peltoniemi

### Introduction

Finland has its own horse breed, *Finnish cold blood, the Finnhorse (fh)*. It is of universal type and is mostly used for sports. The average height at withers is 156 cm and weight 550 kg. The present population is 19 500, 200 breeding stallions and 2 300 brood mares. Approximately 1 200 foals are born yearly (Suomen Hippos, 2008). The total population of *Standardbreds (sb)* in Finland is about 25 000 being the largest horse breed. Annually, 90 stallions and 2 600 mares are used for breeding and 1 600 foals are born.

### Objective

The objective was to examine the Finnish horse breeding data between 1991 and 2005 for possible differences between the two breeds and for changes of foaling rates through the years.

### Material, definitions and methods

The material included about 69 180 matings (one mare mated in one year with one stallion). Only the outcome of the last mating per season (foal or not) was used.

In horse breeding literature, *foaling rate* is a generally used measure of reproductive efficiency and defined as the proportion (%) of mares that have foaled the following year of all mares mated. *Mare age groups* were as follows: young (1-9 years), middle age (10-13 years), high middle age (14-16 years), and old (17-25 years). *The mating methods* were: 1) on site AI (mare artificially inseminated with fresh semen at the same station where the stallion was), 2) transport semen AI (mare artificially inseminated with cooled transported fresh semen at another station or home stable), 3) frozen AI (mare artificially inseminated with frozen semen, used only for Standardbred-mares), and 4) natural mating.

The descriptive results were obtained using clustered column charts and line charts in Excel®.

### Results

For both breeds, the foaling rates were on average almost 10% lower at the end of the study period than in the beginning (Fig.1), with higher foaling rates in Standardbreds. The proportion of old mares clearly increased and that of the young mares declined through the years (Fig.2).

The change in favor of transported semen was quite marked in both breeds through the years, while natural mating became less popular (Fig. 3).

### Discussion

Aging of the mares as well as the increased use of transported semen could explain the declining foaling rates in the Finnish trotters. In this data, same mares, stallions, and stallion managers are found several times because the data covers 15 years. To account for this multilevel hierarchy, multivariable analysis with multilevel hierarchical modelling should be used to analyze the data in more detail. Additionally, the level of inbreeding should be accounted for.

### References:

Suomen Hippos 2008. Breeding statistics. Retrieved July 3, 2008, from [http://www.hippos.fi/hippos/jalostus\\_ja\\_kasvatus/Jalostustilastot.php](http://www.hippos.fi/hippos/jalostus_ja_kasvatus/Jalostustilastot.php)

Figure 1: Foaling rates for Finnhorses (fh) and Standardbreds (sb)

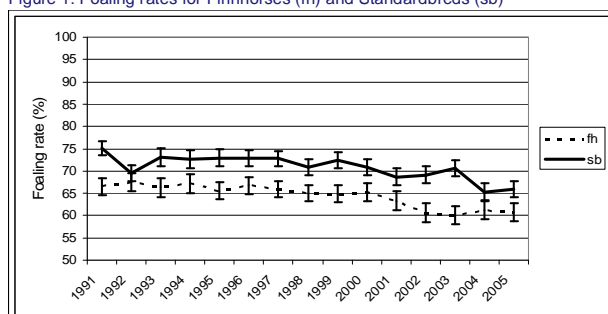


Figure 2: Proportions of age groups for Finnhorses (fh) and Standardbreds (sb)

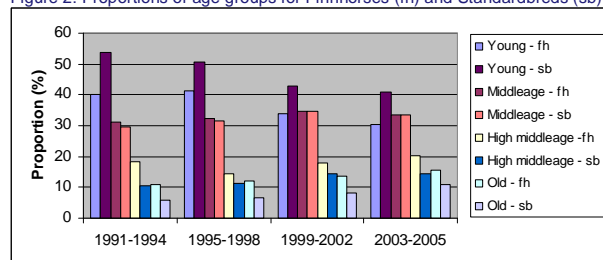


Figure 3: Proportions of mating methods for Finnhorses (fh) and Standardbreds (sb)

