

## MONITORING OF NATIONAL GEESE BREEDS POPULATION ON SLOVAKIA

## MONITORIZAREA POPULAȚIILOR DIN RASELE LOCALE DE GÂȘTE DIN SLOVACIA

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*The aim of this study was to characterise the population size, the properties of endangered national breeds of geese on area of Slovakia and preconditions of these breeds for their future sustainable development in Slovak Republic. The Slovak White Geese was breeding from original regional geese from South-Western Slovakia area with used by heavy and medially heavy German and Hungarian breeds of geese. A breeding basis of the Suchovska geese was comprised of brownish-yellow geese from Suchá nad Parnou that was progressively crossbreed with German (Pomorany, Steinbach) and French origin geese breeds (Toulouse, Landes). Obtained results were used to estimate a genetic diversity and define a genetic distance between Slovak White Geese and Suchovska Geese. We can conclude that value of genetic distance between Slovak White Geese and Suchovska Geese is 0.01834, genetic diversity is very small and we can expect communal origin of these geese breeds. The risk factor of national geese breeds is a low number of Slovak White Geese and Suchovska Geese controlled flocks and this created more pressure on the breeders and poultry judges at the exhibitions and the recognition of controlled flocks.*

**Key words:** Slovak White Geese, Suchovska Geese, controlled flock, breeding, Slovakia

### Introduction

Each individual animal have your genetic and these genes are in interaction amongst each other as well as with the environment. The changes in the genetic variability in the individual populations are continuously assessed and the new variability is being created. This genetic variability is represented in differences amongst individual populations and cannot be replaced. This is because the animal populations are result of an independent evolution and adaptation both happening over the course of centuries under the different selective process and under

different climatic conditions, illnesses, suitable or less suitable nutrition and criteria determined by the human race.

Gandini and Villa (2003) recorded that local breeds are an evidence of great achievements of many generations of breeding. For centuries farmers have been adapting chickens to local conditions, cultural needs and preferences. Unfortunately, over last decades, as a result of the industrialization of agriculture the old local breeds of Europe mostly suffered a gradual decrease in members.

The Slovak White Geese was created on the basis of regional breeds from South-Western Slovakia area. During breeding process regional German and Hungarian types of goose were also used. There was a large decrease in the overall number in 1948 as a result of the creation of large-scale breeding farms and a change of production conditions. The interest to breed this type was renewed thanks Slovak Union of Breeders in the 1960's. The aim of breeding was to have a medium heavy triple purpose (meat, liver, feather) geese suitable for the corn areas, a strong geese, resistant with a good ability to pasture a preservation of instinct of clucking was achieved (Weis et al., 2004).

The Suchovska Geese is result of crossbreeding population of local geese with yellow feathering with French (Toulouse, Landes) and German (Pomorany, Steinbach) geese. This breed of geese created at the end of the 1980's in village Suchá nad Parnou and was recognized as a breed in 1995 year. It required breeding geese of bigger body frame, firm constitution, compact and solid body. The geese should be suitable for pasture. It is also a suitable animal for small farming because of the preservation of the clucking instinct of the geese (Weis et al., 2004).

The aim of this study was to characterise the population size, the properties of endangered national breeds of geese on area of Slovakia and preconditions of these breeds for their future sustainable development in Slovak Republic.

## **Materials and Methods**

For realisation of this study we used certificates of acceptance of national poultry geese controlled flocks of Slovak Union of Breeders. Instructions for acceptance of controlled breed and hatchery in Slovak Union of Breeders differentiate poultry breed based on a level of breeding at A-breed (lowest level), B-breed (medium level) and C-breed (highest level). The certificate of acceptance of controlled flocks of Slovak White Geese and Suchovska Geese contained pointed evaluation of comparison exterior of breed with standard, performance and participation at poultry show, surroundings and hygiene in poultry keeping. For accept of A-breed have to poultry keepers achieved minimal 70 points, B-breed 80 points and C-breed 90 point from totally 100 points. From information, poultry keepers need for arrangement to accept of A-breed kept standard of Slovak White Geese and Suchovska geese along with knowledge about exterior of these breeds of geese. Keepers of B-breed have to breed these geese breeds minimal for two year and in order to gain an accept of C-breeds with individual control of performance is needed rising of Suchovska Geese and Slovak White Geese for minimum three

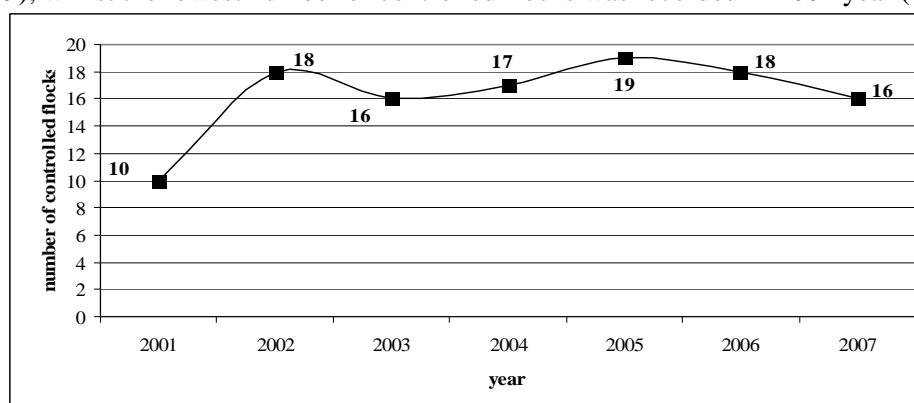
year. Two types of breed, B-breed and C-breed are accepted only on case of participation of breeders at National Poultry Show.

The detection methods and primers design for RAPD-PCR analyzes have been elaborated for the geese breeds populations. Complete gene and genotype structure analysis of Slovak White Geese and Suchovska Geese has been done.

In order to differentiate the individual variants of proteins and enzymes we used methods of direct detection by electrophoresis on agarose gel. We allocated genetic distance (D) between Slovak White Geese and Suchovska Geese from detected alleles frequency at selected coded locus with application a statistical program PHYLIP version 3.63.

## Results and Discussions

Frequency of Slovak Geese controlled flocks has had a fluctuating tendency (Graph. 1). The highest number of controlled flocks we registered in 2005 year (19), whilst the lowest number of controlled flocks was recorded in 2001 year (10).

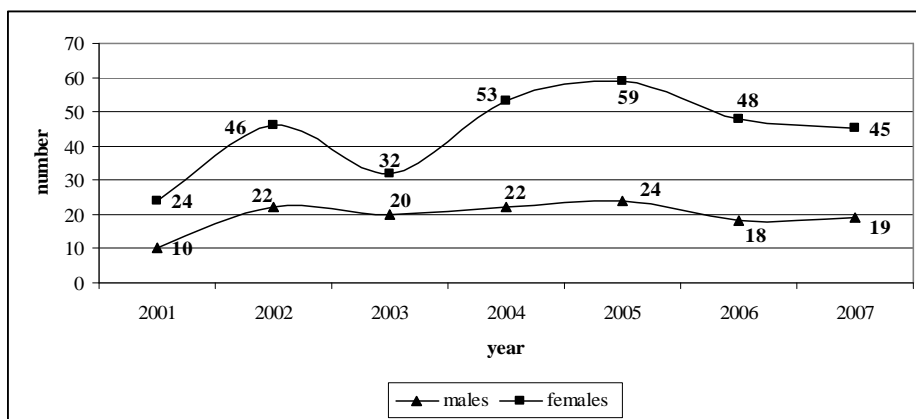


Graph. 1. Frequency of Slovak White Geese controlled flocks in years 2001 - 2007

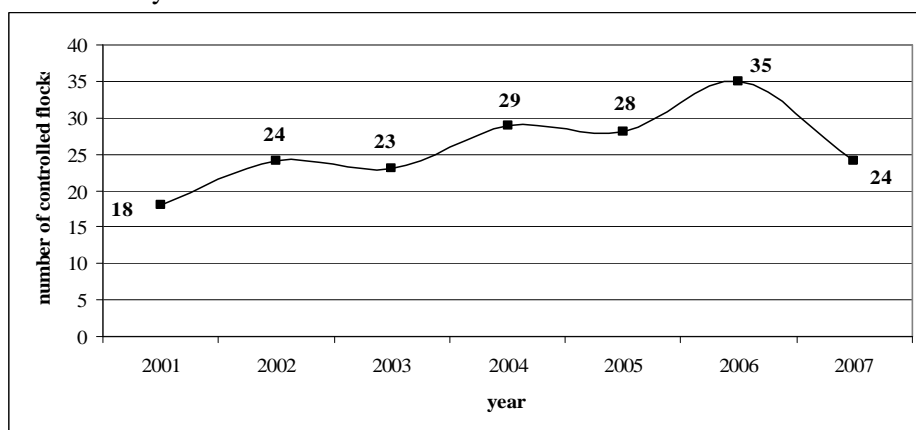
Numbers of males and females integrated in reproduction corresponded with number of controlled flocks of Slovak White Geese (Graph. 2). The highest number of poultry was found in 2005 year (24 males, 59 females), however, the lowest number of poultry we detected in 2001 year (10 males, 24 females).

From Graph. 3 resulted that in case of Suchovska Geese we recorded the lowest number of controlled flocks in 2001 year (18) and higher number was registered in year 2006 (35).

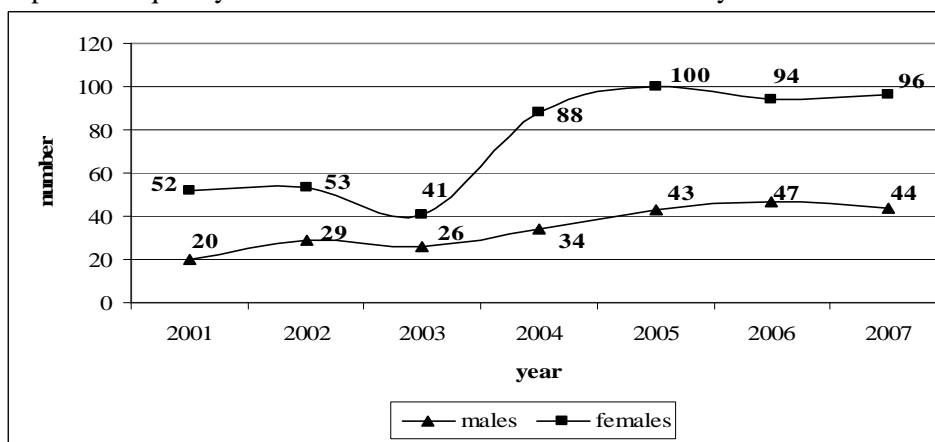
In comparison with females of Slovak White Geese a different tendency has been observed in the case of Suchovska geese (Graph. 4). We detected the lowest number of females in 2003 year (41) and highest number in 2005 year (100). Frequency of males in controlled flocks of Suchovska Geese did not correspond with number of controlled flocks - the highest number in 2006 (47) and the lowest in 2001 year (20).



Graph. 2. Frequency of Slovak White Geese males and females in controlled flocks in years 2001 - 2007



Graph. 3. Frequency of Suchovska Geese controlled flocks in years 2001 - 2007



Graph. 4. Frequency of Suchovska Geese males and females in controlled flocks in years 2001 - 2007

We have identified a polymorphism in locus which determinates erythrocyts, proteins and enzymes systems - haemoglobin, X-protein, carbonic anhydrase, malatedehydrogenase, erythrocyte esterase. The haemoglobin polymorphism appeared in form of identified alleles Hb<sup>A</sup> and Hb<sup>B</sup>. Polymorphism of locus was manifested only in populations of tested national breeds of geese.

Obtained results were used to estimate a genetic diversity ad define a genetic distance between Slovak White Geese and Suchovska Geese. A genetic distance determination is quite used to compare an inbreeding degree of different breeds. This genetic distance reflects the effect of native population on improved breed eventually its contribution on creation of a new breed. The higher value of this indicator effected higher genetics distance of observed populations with reference to their gene pool and genotype combination. We can conclude that value of genetic distance between Slovak White Geese and Suchovska Geese is 0.01834. In term of eventual range of genetic distance is observed genetic diversity very small and we can expect communal origin of these geese breeds.

### Conclusions

The risk factor is a low number of controlled flocks and this creates more pressure on the breeders and poultry judges at the specialised exhibitions and the recognition of breeding flocks. A high risk for the reproduction of geese is a tendency of gander - male geese to be monogamic and the mutual refusal which exist in both sexes. In case of Suchovska Geese while poultry judging and evaluating the poultry it is important to assess very strictly the creation of the tummy and head as well as typical colouring.

Slovak poultry keepers in Slovak Union of Breeders have currently clubs which are concerned with breeding and expansion of national breeds of geese - Breeder Club for Water Poultry, Slovak Breeders Club for geese and Ducks, Breeder Club for Slovak and Suchovska Geese. Activities of clubs are managed by the Central Expert Commission for the Breeding of Poultry of Slovak Union of Breeders. Breeders and exhibitors of the national geese breeds which participated at National Show of Small Animals are supported by capitations of the Ministry of Agriculture of Slovak Republic.

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