

**ANALYSIS OF THE FACTORS THAT INFLUENCE
CONFORMATION TRAITS IN BLUE FOX (*ALOPEX
LAGOPUS L.*)**

**ANALIZA FACTORILOR CARE INFLUENȚEAZĂ
TRĂSĂTURILE CONFORMAȚIONALE LA VULPEA
ALBASTRĂ (*ALOPEX LAGOPUS L.*)**

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*The present work aims at the analysis of the factors that influence animal size and fur quality in blue fox (*Alopex lagopus L.*). The data proceeds from a breeding farm situated in central Poland and concerns three years. The analysis of variance indicates statistically significant effect of the year of birth on animal size, fur quality and colour purity. The birth term had no statistical influence on the analysed traits. Animal sex had significant influence on the following traits: animal size, fur quality and total score. The interactions between year and animal sex, year and date of birth, as well as animal sex and the date of birth did not have statistically significant effect on the measured traits. Estimated phenotypic correlations in the analysed herd ranged from negative to positive. The highest correlations occurred between fur quality and total score (0.800), while the lowest between animal size and fur quality (-0.600). The foxes from the analysed breeding farm were characterised by good parameters of fur and are good breeding material.*

Keywords: *blue fox, animal size, fur quality, variability*

Introduction

The aim of the fur animal breeding is the production of pelt, which value is estimated at sale. In blue fox skin price depends in 64 % on size, in 34 % on quality and only in 2% on fur colour type (Przysiecki et al., 2001). It is important to establish the factors that influence fur quality, as well as to provide the animals with appropriate conditions.

Animal selection is aimed at choosing the best animals by the breeder. The most efficient is the individual selection which allows the breeder to take into account the traits that most interests him (Jeżewska and Maciejewski, 1986).

There are two factors of significant influence on skin quality, important in the estimation of skin value: hair density and equilibrium of hue (Zoń et al., 2000). Hair density is estimated by a subjective method and depends on animal sex, species and animal age; thicker hair is on the back.

Finland is the world's largest producer of blue fox pelts (sold at auction) with more than 2 million skins a year (Barabasz and Gacek, 1999). Breeding work on fur animals is like the work on other animals composed of the following stages: estimation of utility value and breeding value, selection of breeder animals and the mating plans (Jeżewska and Maciejewski, 1986).

The present work aims at the analysis of the factors that influence animal size and fur quality in blue fox (*Alopex lagopus L*) on reproduction farm.

Materials and Methods

The data proceeds from a breeding farm of blue foxes situated in central Poland and concerns three years. The following traits related to animal size and fur traits were measured: animal size and built, colour type, colour purity, fur quality (hair density and hair length) and the total scores (the sum of points for all traits) according to the model (Worzec, 1999). The evaluation is expressed in scores. Animal size is estimated by animal length converted into points. 20 points is the maximum that could be obtained and 0 points for any trait disqualifies the animal from the future breeding. Statistical parameters of the traits (arithmetic means and variability coefficients) were estimated according to the obligatory norms. The analysis of variance, based on mathematical model, was conducted for every trait, taken into account the year, animal sex, the date of birth and the interactions of the factors. The following birth terms were distinguished: I – animals born in April, II – born in May, III – born in June. Additionally, the present work measures the coefficients of phenotypic correlations between the analysed traits.

Results and Discussion

The present research analyses the following traits: animal size and fur quality in blue fox. A total of 582 animals were studied (160 males and 422 females) over three years. The analysis of variances indicates statistically significant effect of the year on the following traits: animal size, colour purity and fur quality. Animal sex had significant influence on animal size, fur quality and the total number of points. In what concerns colour type, the animals obtained the maximum score and consequently this trait is not presented in the results. The interactions between year and animal sex, year and date of birth, as well as animal sex and the date of birth did not have statistically significant influence on the analysed traits.

Table 1 presents statistical characteristic of animal size and fur quality traits according to animal sex and the year. The research proved that animal size in fox was characterised by high means, from 5.92 to 6 points, larger size reached by

males. Also Cholewa and Nowicki (1994) proved that males reached larger sizes than females.

A statistical characterization of fur colour indicates that higher means were obtained by males: 2.85, lower by females: 2.68. These traits varied according to the year of observation. Fur colour purity had the highest estimates in the first year of observation, with higher estimates obtained by males.

Fur quality traits varied over the years 2003-2006. The highest means of fur quality were characteristic for the year 2005, with the highest estimates obtained by males: 7.38. In general, fur quality in blue foxes was at a good level. Appropriate conditions have an important influence on the above mentioned trait.

The year of birth had statistically significant influence on all the traits. Similar conclusion was presented by Socha (1994). Jeżewska and Maciejewski (1986) indicate that environmental and genetic conditions have a decisive effect on fur traits and animal size.

Total score is the sum of points for all traits. The highest total score was obtained by males in 2005: 19.15 points. Over the years 2003-2004 the means slightly varied. The means reached by females differed to a small degree; the highest mean was reached in 2005: 18.66 and the lowest in 2004: 17.92. Cholewa (1994) thinks that high quality of pelts is an extremely significant factor because conditions the best prices for the breeder. Feeding is an important factor which influences fur quality (Lorek et al., 2002).

The present work measures also variability, presented in the form of variability coefficients (V). The highest variability characterised colour purity, which varied between males and females depending on the year. Fur quality, according to the model (Wzorzec, 1999), includes hair length and hair density. The highest coefficient was obtained by males in 2003: 12.42 % and the lowest by females in 2003: 6.44 %. Total score was characterized by relatively low level in the whole analysed period (2003-2005). It was the highest in males in 2004: 4.63 % and the lowest in 2005: 1.91 %, while in females it was the highest in 2005: 5.35 % and the lowest in 2004: 3.40 %.

Table 2 presents correlations between the traits. It is important to stress that the analysis of correlations presented in the work considers correlations between the estimations and not between the absolute values of compared traits resulting from the models of animal evaluation. Recognition of both regularity and value of correlations is especially important while conducting selection on various traits simultaneously and constructing selection indexes.

Conclusions

The present work presents the analysis of the evaluation results of conformation traits in blue fox on reproduction farm. The results lead to the following conclusions:

1. The analysis of variance proves statistically significant effect of the year of birth on animal size, fur quality and colour purity. Birth term had no statistical

influence on the analysed traits. Animal sex had significant influence on the following traits: animal size, fur quality and total score. The interactions between year and animal sex, year and date of birth, as well as animal sex and the date of birth did not have statistically significant effect on the analysed traits.

2. The means of particular traits were as follows: the highest mean was received by animal size in males: 6.00, and in females: 5.97. The means for colour type were 3.00 both in males and females. Higher means of colour purity were received by males: 2.85, while females received 2.68. Fur quality means were as follows: 6.86 in males and 6.40 in females. Means of total score were: 18.87 in males and 18.09 in females.

3. Estimated phenotypic correlations in the analysed herd ranged from negative to positive. The highest correlations occurred between fur quality and total score (0.800), while the lowest between animal size and fur quality (-0.600).

4. The animals on the analysed breeding farm were characterised by good parameters of fur. The breeding farm is well known nationally. The animals are a good breeding material and are frequently presented on exhibitions and receive numerous prizes.

Table 1.

Arithmetic means (\bar{x}) and variability coefficients (V) of traits in a herd of blue fox, depending on the year of research and animal sex

Conformation traits	Year	Males		Females	
		\bar{x}	V	\bar{x}	V
Body size and conformation	2003	6.00	0	5.94	5.23
	2004	6.00	0	6.00	0
	2005	6.00	0	5.92	5.76
	Total	6.00	0	5.97	3.13
Colour type	Total	3.00	0	3.00	0
Colour purity	2003	2.89	10.52	2.76	15.33
	2004	2.81	13.95	2.58	19.14
	2005	2.76	15.54	2.69	17.36
	Total	2.85	12.56	2.68	17.35
Fur quality	2003	6.64	12.42	6.24	11.77
	2004	6.69	9.71	6.34	10.41
	2005	7.38	6.72	7.04	8.26
	Total	6.86	11.34	6.40	10.68
Total number of scores	2003	18.70	3.74	18.09	3.40
	2004	18.52	4.63	17.92	4.83
	2005	19.15	1.91	18.66	5.35
	Total	18.87	4.24	18.09	4.66

Table 2.

Phenotypic correlations between conformation traits in blue fox population.

Conformation traits	Body size and conformation	Colour purity	Fur quality	Total number of scores
Body size and conformation	-	0.013	-0.600	0.152
Colour purity			0.047	0.570
Fur quality				0.800

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