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COMPARATIVE ANALYSIS OF VARIATION OF CONFORMATION TRAITS IN DIFFERENT-COLOUR MINKS

***Damian Zieliński*[1], *Brygida Ślaska*[1], *Andrzej Zoń*[2], *Iwona Rozempolska-Rucińska*[1]**

[1] Department of Biological Bases of Animal Production
University of Life Sciences in Lublin
[2] Experimental Station of the National Research Institute of Animal Production in Chorzelów

Key words: minks, colour variety, quality of fur, auction value, performance evaluation.

Abstract

The aim of the study was to characterize the variability of performance of the colour varieties of pastel, silver blue, and pearl American mink. Observations were made on 996 minks, whose conformation was assessed in accordance with the standard of evaluation. The analysis includes auction results. Among the investigated colour varieties, the most preferred performance features were exhibited by the pearl mink, and the worst were attributed to the pastel mink pelt. The results indicate poorer fur quality of males compared with females. It is evident that there is an association between evaluation of the conformation class obtained by the tested animals and the value of mink pelts in the auction sale.

ANALIZA PORÓWNAWCZA ZMIENNOŚCI CECH POKROJU RÓŻNYCH ODMIAN BARWNYCH NOREK

***Damian Zieliński*[1], *Brygida Ślaska*[1], *Andrzej Zoń*[2], *Iwona Rozempolska-Rucińska*[1]**

[1] Katedra Biologicznych Podstaw Produkcji Zwierzęcej
Uniwersytet Przyrodniczy w Lublinie
[2] Stacja Doświadczana Instytutu Zootechniki Państwowego Instytutu Badawczego w Chorzelowie

Słowa kluczowe: norki, odmiana barwna, jakość okrywy włosowej, wartość rynkowa skór, wzorzec oceny.

Address: Damian Zieliński, University of Life Sciences in Lublin, Akademicka 13, 20-950 Lublin, Poland, phone: +48 (81) 445 68 83, e-mail: damian.zielinski@up.lublin.pl

Abstrakt

Celem badań była charakterystyka zmienności cech pokroju norek amerykańskich (*Neovison vison*) odmiany pastel, silver blue oraz pearl. Obserwacje prowadzono na 996 norkach urodzonych w 2011 r., z których 404 zwierzęta miały oceniony pokrój przez licencjonowanego sędziego i zostały zakwalifikowane do klas A, B+, B oraz C zgodnie z obowiązującym wzorcem oceny. W analizie uwzględniono wyniki aukcji z trzech domów aukcyjnych (SAGA, Kopenhagen Fur, NAFA) w sezonie 2014 i 2015. Na podstawie zaprezentowanych wyników można zauważyć, że istnieje zależność między uzyskaną przez zwierzęta klasą oceny pokroju a wartością aukcyjną skór norek. Wśród badanych odmian barwnych najkorzystniej wyrażonymi cechami pokroju charakteryzowały się norki odmiany pearl, natomiast najgorzej oceniono okrywę włosową norek pastel.

Introduction

In breeding of fur-bearing animals, including mink, the most important features from an economic point of view are the high quality of fur and the size of the skin. However, the effectiveness of mink farming strongly depends on the reproductive performance of the herd. It depends largely on genetic and a number of environmental factors that must be considered throughout the production cycle. The quality of the fur is an inherited trait in mink breeding; therefore, this factor should be an important element of selection (h = 0.613) (SOCHA et al. 2008).

The most important indicator of the profitability of mink farming is the litter size expressed in the number of pups born and reared. However, litters with more than 10 young ones as well as with less than 3 pups can be born, which is not uncommon on the farm. Therefore, minks with a low number of pups should not be mated in the next breeding season. A high herd reproduction rate will ensure profitability of the farm. Additionally, considerable attention should be paid to the differences in the price of mink pelts depending on the variety of the coat colour. The colour varieties of mink skin obtained through breeding work reach higher prices than skins in the standard version (BIELAŃSKI et al, 2005). The aim of the study was to characterize the variability of performance of the colour varieties of pastel, silver blue, and pearl American mink (*Neovison vison*).

Material and Methods

Data for the study were obtained from breeding records of a farm in the South-East of Poland. Observations were made on 996 American minks (*Neovison vison*) born in 2011 (473 males, 523 females). The animals represented by 3 colour types: 306 silver blue (159 males, 147 females), 321 pearl (158 males, 163 females), and 369 pastel (156 males, 213 females).

The characteristics of the tested herd are shown in Table 1. Evaluation of the fur quality was carried out on 404 minks in November, according to accepted assessment procedures (A, B+, B, C) by a licensed judge (*Wzorzec oceny fenotypu*... 2010). The housing and feeding conditions on the farm remained unchanged. The herd was fed in accordance with standards for carnivorous fur animals. The animals were also subjected to necessary preventive and veterinary treatments.

Table 1

Characteristics of the tested herd

Specification	$\bar{x}$	SD	Min.	Max
Date of birth	130.97	2.79	123.00	139.00
Born	6.58	1.80	1.00	11.00
Weaned	6.24	1.76	1.00	11.00

The analyses included the number of pups born and the number of pups weaned per litter and date of birth (in days since the beginning of the year). The probability of assignment of a specific conformation class was analysed by multivariate analysis of variance using the least squares method, taking into account the fixed effects of assessment procedures, sex, colour type, and the colour type x sex interaction. The calculations were made using SAS statistical package (SAS Institute, Cary, NC, USA). The values of the analysed traits are shown as least square means (lsm), providing standard errors (se) that determine the reliability of estimation. Statistical significance was established as $P \leq 0.05$.

Results and Discussion

According to the evaluation standard of the American mink phenotype (2010), the animals are classified into one of four groups (A, B +, B, C), depending on the features of conformation. Minks with best-expressed characteristics receive a rating of ''A' and the worst – ''C''. During evaluating the phenotype of minks, the overall appearance of the animal is assessed, i.e. its physique and size, colour type, colour and purity of the fur, and fur quality, i.e. the length, density, silkiness, and elasticity.

The key aspects of profitability in mink breeding are the size of animals and quality of fur, which have a high share in the price of the skin. FILISTOWICZ et al. (1999) found that the economic value of the size and quality of the skin was 0.64 and 0.34, respectively. The research by WIERZBICKI (2005) confirmed that

the size of the skin accounted for about 60%, and the quality for 28% of the overall volatility of its price. This means that the value of the skins is dependent largely on the above-mentioned characteristics. It should be emphasized that the price of mink pelts also depends on the colour variety (Table 2), which is related to, among others, fashion trends.

Table 2

Average prices for mink (EUR) in two seasons at auctions: Saga®, Kopenhagen Fur and NAFA

Colour type	Sex	2015			2014			$\bar{x}$
		SAGA	Kopenhagen	NAFA	SAGA	Kopenhagen	NAFA	
Pastel	♂	41.20	26.26	nd*	nd*	39.95	54.81	40.55
	♀	28.20	17.03	nd*	nd*	25.44	35.24	26.48
Silver blue	♂	56.65	58.49	nd*	44.47	45.95	51.06	51.32
	♀	36.05	37.48	nd*	28.44	28.41	33.83	32.84
Pearl	♂	50.74	54.61	nd*	45.11	52.81	67.25	54.10
	♀	36.62	39.71	nd*	29.94	35.66	49.68	38.32

* no action results published yet

Due to selective breeding carried out on farms, farmed minks are relatively heavier than wild minks and on average have by 30% larger body sizes and by 50% larger skins (PIÓRKOWSKA, KOWALSKA 2014). The size and quality of the fur is also dependent on the sex. Due to the sexual dimorphism in the minks, the male skins are larger and have a better quality of fur reflected in longer and thicker hair. As indicated by the results of sales at three auction houses: SAGA® (www.sagafurs.com), Kopenhagen Fur (www.kopenhagen-fur.com), and NAFA (www.nafa.ca), regardless of the colour variety, male skins achieve higher prices, which is associated with the higher body weight of males as well as the length and quality of their skins, compared with females. Based on sales reports in the period 2014–2015, it can be concluded that the pearl minks had the best-rated skins. They reached a price by ca. 27.46% and ca. 8.94% higher than that of the pastel minks and the silver blue minks, respectively.

Table 3 shows the probability of assignment of a particular conformation class for the three tested mink colour varieties. The pearl minks were characterized by the greatest likelihood of achieving class A among the three studied colour varieties. Among the pearl minks, it was found that the B + skin class was most likely to occur. The highest probability of obtaining the weakest quality of the fur was recorded in the pastel mink group (class C). The auction sales may explain the results obtained – the highest prices were reached by the pearl minks and the lowest by the pastel-colour animals (Table 2).

Table 3

Probability (lsm) of occurrence of individual classes of mink conformation ratings depending on the variety of colour

Colour	A		B+		B		C	
	lsm	se	lsm	se	lsm	se	lsm	se
Silver blue	0.051[b]	0.020	0.136	0.03	0.110	0.028	0.071[b]	0.029
Pearl	0.123[a]	0.019	0.175[a]	0.028	0.115	0.027	0.069[b]	0.027
Pastel	0.009[b]	0.021	0.095[b]	0.03	0.094	0.028	0.241[a]	0.029

[a,b] – The values in the columns marked with various letters differ significantly at $p \leq 0.05$

The results of evaluations of the particular classes of mink conformation depending on the sex are shown in Table 4. Class B + was noted most likely in females, whereas males were assigned to the weakest class C. The size of the animal is taken into account in the assessment of conformation due to the pronounced sexual dimorphism. Therefore, the results indicate poorer fur quality of males compared with females. The lowest lsm value was recorded for class A, most desirable by breeders, in both females and males (Table 4). This may be due to both the very small size of the animals and the unsatisfactory quality of the coat, which demonstrates the possibilities of further breeding work to improve the quality of the coat in the tested mink colour varieties. KOŁODZIEJCZYK, SOCHA (2006, 2008) have shown that the type of colour, age of the animal, and sex of the examined mink have a significant impact on the characteristics of conformation. Results of other authors evaluating the effect of sex on the conformation traits of different species of fur-bearing animals do not indicate a direct correlation between these characteristics. A study conducted by ŚLASKA (2002) showed that males were characterized by a significantly higher average conformation rating compared with females, but there was no difference in the average overall scores between the sexes. For a majority of mink conformation traits, except for the body size, SOCHA et al. (2001) obtained higher scores in the group of males although statistically significant differences between the sexes were only noted for the quality of the coat and the size of the body. The differences in the skin size depending on the sex, due to the sexual dimorphism of mink, as well as the quality of hides are related to the average of the value pelts in auction sales (Table 2).

Table 4

Probability (lsm) of occurrence of individual classes of mink conformation ratings based on the sex

Sex	A		B+		B		C	
	lsm	se	lsm	se	lsm	se	lsm	se
♂	0.038[b]	0.018	0.085[b]	0.026	0.049[b]	0.025	0.096[b]	0.026
♀	0.084[a]	0.017	0.186[a]	0.024	0.164[a]	0.023	0.158[a]	0.024

[a,b] – The values in the columns marked with various letters differ significantly at $p \leq 0.05$

Based on the results of the research and the price of skins from the auction data, a relationship between the evaluation of the conformation class obtained in our study and the auction value of mink can be noticed. The largest number of animals with high coat quality was found in the evaluation of the pearl minks. Females with this colour variety were characterized by a significantly better coat quality than males (Table 5). The intermediate quality classes (B + and B) were most often obtained by pearl and silver blue mink females. The greatest probability of being assigned to class C was found in both male and female pastel minks.

Table 5

Probability (lsm) of occurrence of individual classes of mink conformation ratings depending on the variety of colour and sex

Colour	Sex	A		B+		B		C	
		lsm	se	lsm	se	lsm	se	lsm	se
Silver blue	♂	0.047^{b}	0.024	0.043^{b}	0.035	0.067^{bc}	0.034	0.063^{bc}	0.035
	♀	0.055^{b}	0.023	0.230^{a}	0.034	0.152^{ac}	0.032	0.080^{bc}	0.033
Pearl	♂	0.065^{b}	0.023	0.108^{b}	0.034	0.026^{b}	0.032	0.044^{bc}	0.033
	♀	0.182^{a}	0.023	0.242^{a}	0.033	0.205^{ac}	0.031	0.094^{bc}	0.032
Pastel	♂	0.003^{c}	0.025	0.104^{b}	0.037	0.053^{b}	0.035	0.180^{c}	0.036
	♀	0.015^{b}	0.022	0.087^{b}	0.033	0.136^{ac}	0.031	0.301^{a}	0.032

^{a,b} – The values in the columns marked with various letters differ significantly at $p \leq 0.05$

PIÓRKOWSKA et al. (2014) evaluated the conformation in a population of pastel minks kept in different numbers per cage using the dual standards of evaluation: the first one in force until 2009 (2000) and the one that is currently being used (2010). For minks kept in pairs in cages, the average overall rating according to the first evaluation standard (2000) amounted to 16.97, while the following results for the different classes were obtained according to the new method of evaluation (2010): A (12.12%), B + (54.55%), B (21.21%), and C (12.12%). The results obtained are not consistent with the herd of pastel minks tested in our study, where 52.60% of the animals were assigned to class C. In accordance with the new evaluation system, such minks are eliminated from further breeding. Similar results were obtained in the group of silver blue minks where 11.96% of the animals were assigned to class A and 41.30% class B+. Pearl minks achieved the best assessment class, where as many as 64.75% of the animals were classified to the most desirable Class A and B+. While assessing the conformation traits for standard and palomino minks, KOŁODZIEJCZYK, SOCHA (2008) reported an average overall rating of 17.93–19.47 points, which can be classified to class B+ and A in the new assessment system.

Based on these results, it can be concluded that the pearl colour variety was the most preferred mink conformation trait, while the pastel colour minks were characterized by the worst rating. The differences in the probability of assignment of each conformation class indicate high variability of the coat quality between males and females, as well as between the different mink colour varieties. The differences in the size and quality of skins depending on sex and colour variations are related to the average auction value of pastel, silver blue, and pearl pelts.

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