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INFLUENCE OF AGE, SEX AND EVALUATION YEAR ON CONFORMATION TRAITS OF STANDARD CHINCHILLA

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Abstract. The aim of the study was to determine the effect of age, sex and evaluation year on conformation traits in the Standard chinchilla. Data for the analysis was collected over the years 2007–2010 and comes from conformation assessments performed on 1657 Standard chinchillas (976 females and 681 males) raised on farms in the north of Poland. The analysis revealed that the best rated traits of conformation included belly belt, age, and size. The study also showed that the effects of age, sex, and the year of evaluation on chinchilla conformation scores were statistically significant. Moreover, it was observed that for different ages (from 6 to more then 15 months) the results achieved by particular animals for the size and shape, color type, or quality of fur were significantly different and reached the highest values for chinchillas at age 7–10 and 11–14 months. Also a significant effect of sex was found in relation to color type and purity of fur, and better scores were attained by males. A significant interaction was found between age and sex in relation to color purity of fur.

Key words: chinchilla, conformation traits, phenotype correlations

INTRODUCTION

The world fur market has recently shown a relatively new tendency that, besides high-quality furs of minks, foxes and raccoons, chinchilla pelts become more and more popular and demanded. Good quality chinchilla pelts are produced in Poland and the production volume has become important to the European market

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[Barabasz and Nowak 2006]. A high density (20 000 hair · 1 cm^{-2}) of delicate, short hair (approx. 20 mm) causes that the fur of this animal are soft and silky. Additionally, it is worth to mention that the chinchillas' coat is exceptional in the way that is connected with an uneven distribution of pigment along the hair. This in turn causes irregular picture of color zones or stripes. However, the result of this unevenness is also a white strip clearly seen on down hair contrasting with the dark ending of hair of the outer coat. This hair should be more dense alongside the line of spine and it should gently, evenly pass onto the animal sides. The difference of fur colors for these animals consists also in the existence of a white belly belt [Sulik and Cholewa 1998].

The features of chinchilla fur were highly appreciated even in the ancient Inca Empire, where they were used for making luxurious wear for the royal family or priests, whereas low quality pelts were used for production of blankets [Duda 1992]. Nowadays, the demand for chinchilla fur is constantly growing and the prices on international auctions are really high – reaching 40 Euros per pelt [Scheepens 2012]. According to the most recent data from the National Center of Animal Breeding (Polish abbreviation: KCHZ), the number of breeding farms in Poland and the aggregated total size of herd (subjected to performace evaluation) has been constantly growing for the last four years and remained permanently on very high level [Wykaz Stad Szynszyli i Nutrii 2009, 2010, 2011, 2012]. It is connected with the high profitability of this kind of production, which – in comparison to mink or fox farming – requires relatively low financial investments for the creation and running of a farm [Nowak 1995].

Chinchilla farming is a strong argument against the word-wide campaign to ban breeding of fur-bearing animals. Should there be no cage breeding of chinchillas, the species would have been totally extinct by now [Barabasz 2001].

Obtaining high quality pelts is a result of the adequate breeding policy and work based on e.g. evaluation of performance of these animals (so called license, license procedure). During the license procedure for chinchillas, the following traits are evaluated and scores are assigned: body size and shape, color type, purity of fur, and belly belt. The individuals that achieve a high evaluation in particular traits are used for herd replacement. The traits which have the most important influence on a fur price are size and quality of fur (hair). Therefore, it is really important to enter into the breeding herd those animals that are excellent or outstanding just in terms (mainly) of these two traits. An analysis of quality of some fur traits of the standard chinchilla, though in slightly different approach then presented here, was described in other authors e.g. Sulik and Cholewa [1998], Socha and Olechno [2000], Socha [2001], Jeżewska et al. [2006].

The main aim of the study was to determine the effect of age, sex of animals, and evaluation year (i.e. time when the license procedure took place) on the final

results of conformation evaluation of the Standard chinchilla based on the available data.

MATERIAL AND METHODS

Data for investigations and analyses were collected from the National Center of Animal Breeding in Warsaw (Branch in Bydgoszcz). The data referred to conformation evaluation of Standard chinchillas. The final data sets were aggregated upon the data originated from 7 breeding farms located in northern Poland. During the license procedure of chinchillas, evaluation of the following traits is usually done (giving score in points): body size and shape (max. 4 pts), color type (max. 5 pts), purity of fur (max. 9 pts), quality of fur (max. 9 pts) and belly belt (max. 3 pts). Therefore, the maximal score for a particular animal could reach 30 pts.

The analyses were performed on 1657 individuals, including 976 females and 681 males. The analysis covered 4 consecutive years of evaluation (2007–2010). Taking into account the animal birth day and the date of evaluation, the age at license was calculated (months). Based upon these data, the population was divided into 4 age subgroups (months): '≤ 6' – 141 individuals, '7–10' – 1232 individuals, '11–14' – 124 individuals and '≥ 15' – 158 individuals.

The traits connected to conformation rating (i.e. body size and shape, color type, purity of fur, quality of fur, as well as belly belt) are quantity and discrete traits. Applying the Shapiro-Wilk test, it was confirmed that the distributions were significantly different from the normal distribution. Therefore, the data was subjected to the probit transformation [Dobek and Szwaczkowski 2007, Nogalski and Piwczyński 2012] aimed at normalization of the distribution. However, the trait 'total number of points' was not subjected to the probit transformation, since this value had a distribution close to normality. Subsequent steps of the analysis included: effect of sex, age and year of evaluation on the transformed variables as well as a trait 'total sum of points'. The multi-way ANOVA was performed by means of the least-squares method. The following linear model was applied:

$$y_{ijkl} = \mu + S_i + A_j + R_k + (S \times A)_{ij} + (S \times R)_{ik} + e_{ijkl},$$

where:
y_{ijkl} – individual yield, μ – general average, S_i – fixed effect of sex i, A_j – fixed effect of animal age j, R_k – fixed effect of k-th year of investigations, $(S \times A)_{ij}$ and $(S \times R)_{ik}$ – interactions between the factors, e_{ijkl} – random error.

Significance of differences between groups was estimated by means of the Tukey test [SAS 2011]. Aiming for determination of the mutual relationships between the investigated traits of chinchillas' conformation, the Spearman's rank

correlation coefficients were calculated. All the calculations were done by means of the statistics package SAS [SAS 2011].

RESULTS

Results of confirmation evaluation measured in points (pts) for the whole investigated population of standard chinchillas within the period 2007–2010 are presented in Table 1. Variability of the analyzed traits measured by means of the Pearson coefficient was in the range 8.37 (according to the trait: total number of points) up to 18.15% (according to the trait: fur quality).

Table 1. Results of conformation evaluation (in points) of the standard chinchilla

Tabela 1. Wyniki oceny pokroju (w punktach) szynszyli odmiany standard

Trait Cecha	N	$\bar{x}$	Sd	V(%)
Animal size and constitution (max. 4 pts) Wielkość i budowa zwierzęcia (maks. 4 pkt)	1657	3.66	0.60	16.35
Color type (max. 5 pts) Typ brawny (maks. 5 pkt)	1657	3.14	0.54	17.26
Color purity of fur (max. 9 pts) Czystość barwy okrywy włosowej (maks. 9 pkt)	1657	6.80	0.90	13.22
Fur quality (max. 9 pts) Jakość okrywy włosowej (maks. 9 pkt)	1657	6.75	1.23	18.15
Belly belt (max. 3 pts) Pas brzuszny (maks. 3 pkt)	1657	2.90	0.30	10.46
Total sum of points (max. 30 pts) Suma punktów (maks. 30 pkt)	1657	23.25	1.95	8.37

In Table 2, percentage shares of particular evaluations (obtained during confirmation evaluation procedure) of the analyzed traits are presented taking into account sex of animals. The traits: animal size and shape as well as belly belt had the high percentage of high evaluation values (from 70.93 to 90.88%). In the case of animal size and shape, females more frequently obtained the evaluation 4 pts (in comparison to males). For the both afore mentioned traits, there was however the wide spread of achieved evaluation results – i.e.: all possible evaluation values (according to the formal pattern) were assigned to some particular animals. In the case of color type, both males and females – most frequently – obtained the evaluation of 3 pts (Table 2). Moreover, the maximal scores were observed only for 1% of females and 3% of males.

For color purity and fur quality, the animals most frequently attained the score of 7 pts (from the range 1 to 9 pts, based upon the formal pattern), which was assigned to 69.02% of males, and 69.98% of females. The range of assigned scores for color purity ranged from 2 to 9 pts and for the fur quality – from 3 to 9 pts.

The proportion of animals that achieved the top score was 4.51–6.17% and 11.48––15.42% for fur purity and quality, respectively.

Table 2. Percentage share of particular evaluation points for the investigated traits assigned during the evaluation of conformation of the Standard chinchilla

Tabela 2. Procentowy udział poszczególnych ocen dla badanych cech przyznawanych podczas oceny pokroju szynszyli odmiany standard

Trait Cecha	Points Punkty	Sex – Płeć				Total Razem
		Females – Samice		Sales – Samce		
		N	%	N	%	
Animal size and constitution	1	3	0.31	0	0.00	3
(max. 4 pts)	2	59	6.05	44	6.46	103
Wielkość i budowa zwierzęcia	3	189	19.36	154	22.61	343
(maks. 4 pkt)	4	725	74.28	483	70.93	1208
Color type	2	104	10.66	37	5.43	141
(max. 5 pts)	3	683	69.98	470	69.02	1153
Typ barwny	4	188	19.26	171	25.11	359
(maks. 5 pkt)	5	1	0.10	3	0.44	4
Color quality of fur	2	1	0.10	0	0.00	1
(max. 9 pts)	3	2	0.20	1	0.15	3
Czystość barwy okrywy	5	175	17.93	72	10.57	247
włosowej	7	754	77.25	566	83.11	1320
(maks. 9 pkt)	9	44	4.51	42	6.17	86
Fur quality	3	1	0.10	4	0.59	5
(max. 9 pts)	5	237	24.28	173	25.40	410
Jakość okrywy włosowej	7	626	64.14	399	58.59	1025
(maks. 9 pkt)	9	112	11.48	105	15.42	217
Belly belt	1	0	0.00	1	0.15	1
(max. 3 pts)	2	89	9.12	76	11.16	165
Pas brzuszny (maks. 3 pkt)	3	887	90.88	604	88.69	1491
Total – Razem		976	–	681	–	1657

Based upon the results presened in Table 3, it was recognized that sex has a statistically significant influence on such traits as: color type and color purity. In turn, the age of evaluated animals had a significant effect on the following traits: animal size and shape, color type and total score (achieved at rating). The year of evaluation had an influence on all investigated traits. The analyzed interactions between sex and age as well as sex and year of evaluation – in most cases – were non–significant besides fur purity.

The ANOVA showed a significant influence of the interaction sex $\times$ age on the fur purity (Fig. 1). Based on an analysis of mean values of this trait – taking into account animal sex and age, it was observed that within the male population – increase of value was even. However, within the female population – the same tendency (as for males) was observed until 14 months of age. The mean value for the subgroup of the highest age (i.e. $\geq$ 15 months) was similar to this characteristic for the former age subgroup (i.e. 11–14 months).

Table 3. Value of the F statistics and convidence level (P) of investigated main traits and interactions

Tabela 3. Wartość statystyki F oraz istotność (P) badanych czynników głównych i interakcji

Trait Cecha	F/P	Sex – Płeć S	Age – Wiek A	Year of investigations Rok badań,Y	S × A	S × Y
Animal size and constitution Wielkość i budowa zwierzęcia	F	0.220	11.700	18.190	0.290	0.430
	P	0.639	<0.0001	<0.0001	0.834	0.650
Color type Typ barwny	F	5.260	8.870	9.800	1.570	0.110
	P	0.022	<0.0001	<0.0001	0.195	0.894
Color quality of fur Czystość barwy okrywy włosowej	F	7.050	14.240	3.980	3.610	1.510
	P	0.008	<0.0001	0.008	0.013	0.222
Fur quality Jakość okrywy włosowej	F	2.070	2.720	14.100	2.410	2.110
	P	0.151	0.043	<0.0001	0.065	0.122
Belly belt Pas brzuszny	F	3.690	0.730	9.690	1.800	1.600
	P	0.055	0.535	<0.0001	0.145	0.203
Total sum of points Suma punktów	F	0.410	6.060	11.980	0.160	0.480
	P	0.522	<0.000	<0.0001	0.926	0.617

$P \leq 0.05$ – differences significant; $P \leq 0.01$ – differences highly significant.
$P \leq 0,05$ – różnice istotne; $P \leq 0,01$ – różnice wysoce istotne.

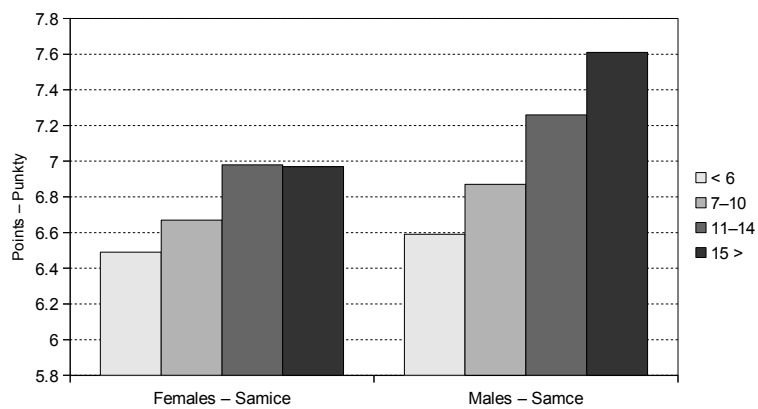

Fig. 1. Increase of values (in pts) of the trait color purity of chinchilla furs depending on sex for particular age intervals (in months)

Rys. 1. Przyrost wartości (w punktach) cechy czystość barwy okrywy włosowej u szynszyli w zależności od płci w poszczególnych przedziałach wiekowych (w miesiącach)

Comparing the mean values of evaluation stores (measured in points) for the other traits – taking into account the sex – we can state that males in comparison to

females obtained higher scores for color type and fur purity (Table 4). In the case of other traits, the results (of evaluation) obtained by both sexes were comparable.

Table 4. Influence of sex, age of females and year of investigations on traits taken intoAccount during evaluation of conformation of standard chinchilla

Tabela 4. Wpływ płci, wieku samic, roku badań na cechy brane pod uwagę przy ocenie pokroju szynszyli odmiany standard

Trait Cecha		Sex – Płeć		Age – Wiek				Year of investigations – Rok badań			
		Females Samice	Males Samce	6	7–10	11–14	15 >	2007	2008	2009	2010
Animal size and constitution Wielkość i budowa ciała	N	975	680	141	1232	124	158	164	514	572	405
	$\bar{x}$	3.68	3.65	3.89^{A}	3.62^{AB}	3.68^{A}	3.80^{B}	3.24^{A}	3.80^{AB}	3.70^{AB}	3.62^{AB}
	CV	16.30	16.43	11.77	16.99	16.83	13.09	27.77	12.82	13.33	17.49
Color type Typ barwny	N	975	680	141	1232	124	158	164	514	572	405
	$\bar{x}$	3.09^{A}	3.20^{A}	2.95^{Aa}	3.12^{Bab}	3.35^{AB}	3.28^{Ab}	3.13^{A}	3.12^{B}	3.05^{C}	3.28^{ABC}
	CV	17.58	16.53	18.26	16.64	17.91	17.55	19.45	18.32	15.40	16.32
Color purity of fur Czystość barwy okrywy włosowej	N	975	680	141	1232	124	158	164	514	572	405
	$\bar{x}$	6.72^{A}	6.91^{A}	6.53^{A}	6.76^{B}	7.06^{AB}	7.11^{AB}	6.93^{A}	6.80	6.67^{A}	6.90
	CV	13.91	12.00	14.00	13.07	12.47	12.39	14.62	14.47	13.14	10.50
Fur quality Jakość okrywy włosowej	N	975	680	141	1232	124	158	164	514	572	405
	$\bar{x}$	6.74	6.78	6.80	6.73	7.00^{A}	6.76^{A}	7.16^{A}	6.76^{AB}	$6.52A^{C}$	$6.93B^{C}$
	CV	17.44	19.1	16.22	18.83	17.09	14.69	16.66	16.86	18.64	18.65
Belly Belt Pas brzuszny	N	975	680	141	1232	124	158	164	514	572	405
	$\bar{x}$	2.91	2.89	2.88	2.90	2.96	2.88	2.83^{A}	2.88^{B}	2.89^{C}	2.97^{ABC}
	CV	9.91	11.21	11.35	10.55	6.67	11.33	13.34	11.24	10.92	6.61
Total sum of points Suma punktów	N	975	680	141	1232	124	158	164	514	572	405
	$\bar{x}$	23.13	23.42	23.06^{A}	23.11^{B}	24.06^{AB}	23.84^{AB}	23.29^{a}	23.36^{Ab}	22.83^{ABab}	23.69^{ABa}
	CV	8.40	8.29	7.58	8.47	8.55	7.01	9.65	7.96	8.21	8.09

AA (aa) – mean marked by the same capital (lower-case) letters differ at $P \leq 0.01$ ($P \leq 0.05$).
AA (aa) – średnie oznaczone jednakowymi wielkimi (małymi) literami różnią się przy $P \leq 0,01$ ($P \leq 0,05$).

Taking into account the traits influenced byage (based upon statistical tests), a general trend was found that the older the animal the higher score for color type and color purity (Table 4). In the case of fur quality and total score, the highest mean values were characteristic for animals within the age were within the range from 11 to 14 months.

Analyzing the results of the chinchilla confirmation rating for the period 2007––2010, it has been observed that the mean values of body size and shape as well as color type had an increasing tendency (Table 4). In turn, color purity slightly decreased. However, an evident drop in rating scores was registered for fur quality – achieving the lowest value in 2009 (6.52 pts). Bely belt was the only trait which had constant increasing tendency within the investigated period. The mean total score increased significantly in the beginning, folowed by a relative decrease in 2009, and in 2010 this trait reached the highest score. The average evaluation re-

sults for this last considered trait differed significantly in comparison to the former years (Table 4).

Analyzing the values of Spearman coefficient of correlation (Table 5), it was stated that the greater was the chinchillas size, the slightly worse ($P > 0.05$) were such traits as: fur color type, fur quality and belly belt. It was also recognized that fur color purity, fur quality and belly belt had highly significant influence on the final phenotype evaluation. The highest value of the correlation coefficient was registered for the fur quality and the total score.

DISCUSSION

An increase of interest in breeding of the chinchilla can be observed not only in Poland but also in other European countries [Całka et al. 2005, Barabasz 2008]. Only recently, a strong interest in chinchilla breeding has begun in Russia.

In most cases, the farmers – selecting animals for the herd – take into account its conformation, i.e. phenotype, because it is a quick method and uncomplicated to carry out under on-farm conditions. Its drawback is subjective approach, although it is applied in many countries [Kopeć et al. 2000]. Strict and honestly performed assessment of confirmation is an important tool for a proper breeding policy.

Table 5. Spearman's correlation coefficients between investigated traits for the evaluation of confirmation of standard chinchillas

Tabela 5. Współczynniki korelacji Spearmana między badanymi cechami przy ocenie pokroju szynszyli odmiany standard

Trait Cecha	Animal size and constitution Wielkość i budowa zwierzęcia	Color type Typ brawny	Color quality of fur Czystość barwy okrywy włosowej	Fur quality Jakość okrywy włosowej	Belly belt Pas brzuszny	Total sum of points Suma punktów
	1	2	3	4	5	6
1		–0.0321	0.0038	–0.0250	–0.0210	0.2557**
2			0.2223**	0.1223**	0.1204**	0.4732**
3				0.1349**	0.0594*	0.5813**
4					0.0950**	0.7341**
5						0.2369**
6						

* Correlation significant at $P \leq 0.05$. Współczynnik korelacji istotny przy $P \leq 0{,}05$

**Correlation highly significant at $P \leq 0.01$. Współczynnik korelacji wysoce istotny przy $P \leq 0{,}01$.

Based upon the performed analysis of evaluation of conformation of Standard chinchilla in northern Poland within the period 2007–2010, we can state that the sizes of investigated chinchillas were on a satisfied, good level. It should be highlighted that this trait mostly influences the size of the obtained pelt. This relationship, i.e. between the body weight and the pelt length ($r_{xy} = 0.650$) was also

confirmed though in-depth investigations by a Hungarian author, Lanszki [1999]. The high dependence ($r_{xy} = 0.896$) between the body length and the fur length was reported by Poyraz et al. [2005].

According to Zimmerman [1956], the animals having a long black ending of a hair, and a short white zone of down fur are those most demanded. The average value of color type (3.14) observed here strongly deviated from the maximal value, i.e. 5 pts. The chinchillas' fur color depends on the level of the color zones of the hairs. Therefore, the conclusion can be drawn that some intensification of breeding works is needed aiming at an improvement of color type.

Within the five evaluated traits, the most close to the pattern value was the mean value of belly belt and fur quality, which differed most significantly from the possible maximal score. Based upon the investigations performed by Socha [1996], it was obtained that the hereditary coefficient connected with the fur density – i.e. a parameter which has an significant influence on the fur quality – is very low. It varies within the range from 0.046 to 0.315 – depending on components from parents. Due to this relationship, the author suggests that the selection should be viewed considering additionally other traits (e.g. performance of offspring) and the farmers should not rely only on the phenotype evaluation.

The total score observed here was identical to that obtained by Socha et al. [2004] on a chinchilla farm in southern Poland.

To sum up, it should be stated that among 5 evaluated traits – where according to the pattern valid in 2000, a particular chinchilla can achieve 30 pts – the fur quality was the trait having the greatest difference between assign values and the possible maximum. It proves the necessity of intensification of breeding works also for this trait.

The performed analysis of scores assigned to particular traits shows that in the case of an animal size and shape, as well as belly belt – there were more than 70% of highest scores. Similar results according to the animal size and shape were obtained also by Święcicka et al. [2011]. They investigated the standard chinchillas on the 5 farms in northern Poland. In other investigations of Święcicka et al. [2012], even greater population (80%) of individuals excellent according to the trait: belly belt was observed.

In our study, fur purity and fur quality were more frequently assigned 7 pts. The same percentage of 7-point scores for fur purity was noted by Święcicka et al. [2011]. It should be stressed that this trait has also a significant influence on the price of the pelt [Barabasz 2001]. Cappelletti and Rozen [1995], basing upon their investigations, expressed an opinion that the fur quality is determined mainly by guard hair, despite the fact that their proportion in the coat is relatively low.

The highest share of maximal evaluations (3 pts) was characteristic for the belly belt for both males and females (Table 2). The maximuml score is assigned

to an animal that has a characteristic snow-white belly belt, showing a clear contrast alongside the body sides [Woźny 2002]. The belly belt was the most stable trait of chinchilla in the investigated farms.

As was formulated e.g. by Sulik and Cholewa [1989], the color purity means that there is lack of fluctuation of the main color, lack of any color zones, spots of slightly other colors. Lack of color purity can have different nature e.g. yellowish or brown discolorations. Color purity to a great extent depends on lighting. Felska-Błaszczyk and Brzozowki [2005] show that the optimal lighting should remain within the range from 21 to 80 lx. Moreover, increasing of lighting above 120 lx causes deterioration of fur quality as well as some worsening of color purity [Felska-Błaszczyk 2006]. Socha et al. [2007] had shown statistically significant influence of the animal sex on color type of hair and highly significant influence on color purity of hair.

In the analyzed chinchilla population, females and males differed highly significantly according to traits: color type and color purity of fur hair, with males achieveing higher scores. The superiority of males over females in the discussed traits was observed also by Socha et al. [2010].

Considering the influence of age on the evaluated traits, it was observed that the higher was the age, the better were color type and color purity. This relationship indicates that just the individuals of age 11–14 months, 15 months and older have fully developed mature hair. Comparing the total score within the period from 2007 till 2010 (Table 4), we can state that there was an increase of the parameter by 0.40 pt, which confirms the proper direction of the breeding work. However, the overall level is still slightly dissatisfying.

We found a negative though low and non-significant relationship between 'body size and shape' and 'color type and quality of hair fur as well as belly belt' (Table 5). It confirms the low influence of animal size and shape on the evaluation of traits taken into account during an evaluation of chinchillas' conformation. However, the positive and statistically significant correlation was observed between body size and shape and total score. Similar correlations among the above discussed traits were fuond also by Socha et al. [2010], Święcicka et al. [2011], and Zawiślak et al. [2011].

The results by Socha et al. [2010] demonstrated a positive and low correlation (correlation coefficients ranging 0.026–0.254) among most of traits evaluated during license procedure, with an exception of animal size and shape. In the presented own investigations, the same nature and tendencies of relationships were obtained. Moreover, all calculated relationships were confirmed via adequate statistical tests.

All the traits taken into account during the license procedure were positively and significantly correlated with total score attained. Kołodziejczyk et al. [2013]

show similar dependencies. The strongest relationship was observed between fur quality and total score (Table 5). A similarly strong relationship ($r_{xy} = 0.678$) between these two traits was noticed also by Socha et al. [2010].

It is also important to highlight the low and positive significant correlation between color type and fur quality. Taking into account the fact that these traits demand active and dedicated breeding works, however improving one of these traits should cause an improvement in the other. Such possibility is theoretically confirmed through positive genetic correlations ($r_g = 0.22$) between color type and general appearance of an animal, which was expressed by Wierzbicki and Filistowicz [1999].

As far as highly heritable traits are concerned, performing of proper breeding works is relatively easy; however in the case of low heritability nature (such as e.g. fur quality), an improvement in the breeding value of chinchillas on a farms poses much difficulty.

CONCLUSIONS

1. The analysis of Standard chinchilla conformation evaluation (carried out in the years 2007–2010) proved that the traits belly belt as well as animal size and shape were evaluated as the highest (highest scores). On the other hand, quality of fur attained lower scores. Due to this, it is necessary to intensify the breeding programs aiming at improved fur quality, taking into consideration that this trait is most strongly correlated with the total score (aggregated number of points).
2. Based upon the performed investigations, it was proved that the age of the evaluated chinchillas had an significant statistical influence on: animal size and shape, fur color type and total sum of points. The sex of the evaluated animals had a highly significant influence on fur color type and fur purity. Moreover, the year of evaluation was a statistical source of variability in all the analyzed traits of chinchillas.

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WPŁYW WIEKU, PŁCI I ROKU OCENY NA CECHY POKROJU SZYNSZYLI ODMIANY STANDARD

Streszczenie. Celem badań było określenie wpływu wieku ocenianych zwierząt, płci oraz roku przeprowadzonej oceny na cechy pokroju szynszyli odmiany standard. Materiał do badań stanowiły wyniki oceny pokroju szynszyli odmiany standard przeprowadzonej na 1657 osobnikach (976 samicach i 681 samcach) pochodzących z ferm z północnej części Polski w latach 2007-2010. Na podstawie przeprowadzonych badań stwierdzono, iż najwyżej ocenione cechy pokroju to pas brzuszny stanowiący u ponad 90% osobników ocenę doskonałą oraz wielkość i budowa zwierzęcia, gdzie maksymalną liczbę punktów (4 pkt.) otrzymało 74% zwierząt. W badaniach wykazano, statystyczny wpływ wieku ocenianych zwierząt, płci oraz rok przeprowadzanej licencji na wielkość oceny szynszyli. Zaobserwowano, iż w różnych grupach wiekowych szynszyli (do 6 mies., 7–10 mies., 11–14 mies., pow. 15 mies.) wyniki uzyskane przez zwierzęta za wielkość i budowę, typ barwny czy jakość okrywy włosowej różniły się istotnie. Najwyższą wartość tych cech wykazywały szynszyle z grup wiekowych 7–10 mies. i 11–14 mies. Ponadto, przy zastosowaniu analizy wariancji wykazano statystyczny wpływ płci na typ barwny i czystość okrywy włosowej. Stwierdzono, że wyższą punktację za powyższe cechy otrzymywały samce. Odnotowano istotną interakcję między wiekiem a płcią w zakresie czystości barwy okrywy włosowej.

Słowa kluczowe: szynszyle, cechy pokroju, interakcje, korelacje fenotypowe

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