Annals of the University of Oradea, Fascicle: Ecotoxicology, Animal Husbandry and Food Science and Technology, Vol. XVII/B 2018

Analele Universitatii din Oradea, Fascicula: Ecotoxicologie, Zootehnie si Tehnologii de Industrie Alimentara, Vol.XVII/B 2018

STUDY REGARDING THE MORPHOLOGY OF CAL DE BUCOVINA POPULATION, IN LUCINA STUDFARM, SUCEAVA COUNTY

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Abstract

The purpose of this paper was to analyze the morphological parameters of 21 horses of Cal de Bucovina population, selected for reproduction, in Lucina studfarm. The necessity of exploring this subject emerged from the authors' desire to contribute with researches about this indigenous horse breed, still insufficiently analyzed. Whereas the breed Cal de Bucovina holds interesting characters, acquired by crossing the Romanian Semigreu with Huțul horse breed and furthermore the number of registered livestock in Romania is reduced, we considered that highlighting the level of morphological status of Lucina studfarm population can offer a good perspective of the future of the breed we studied.

The analyze performed in this scientific paper included 3 body measurements found also in the scoring chart paper, like wither height (143.10±0.98 cm), chest girth circumference (171.48±1.80cm) and cannon bone circumference (19.81±0.22 cm), which led to the calculation of some of the body indices like massiveness index (119.42±1.09%), bone index (13.80±0.14%) and dactilo-thorax index (11.57±0.13%).

Key words: horses, mares, stallions, measurements, indices.

INTRODUCTION

The population of Cal de Bucovina is currently extremely low, being preserved through care of horse experts in Lucina studfarm.

The horse breed Cal de Bucovina, resulted by crossing the Romanian Semigreu and Huțul breeds, shows an interesting series of characters but, unfortunately, not widely studied (Burlică, 2009, Doliș et al., 2008, Doliș et al., 2014, Iacob et al., 2016, Mărginean, 2012). For this reason, we welcome any specialty study on this horse population.

Thus our study is also about adding a contribution to the information known about this horse and it follows to analyze the morphological parameters of Calul de Bucovina existing in Lucina studfarm.

MATERIAL AND METHOD

The biological material consisted in 21 horses from Cal de Bucovina population, from which 10 were reproduction mares and 12 were stallions (2 sires which represent the troop of Lucina studfarm and 9 public mount stallions).

The horses are from MOLID I, MOLID II, PILOT I and GĂMAN II genetic lines and the study included 3 body measurements that appear in all scoring chart papers like wither height, chest girth circumference and cannon bone circumference. (Doliș, 2008,2009, Doliș et al., 2008, Doliș et al., 2011, Doliș et al., 2014, Doliș et al., 2017, Furtunescu, 1971, Mărginean, 2005, Moldoveanu et al, 1961, Nagy et al., 2012).

Likewise, we calculated three body indices: massiveness index - (chest girth circumference/wither height) x 100, bone index - (cannon bone circumference/wither height) x 100 and dactilo-thorax index - (cannon bone circumference/chest girth circumference) x 100.

Data obtained regarding body measurements were centralized and statistical processed. (Cucu și et al., 2004)

RESULTS AND DISCUSSION

Regarding body measurements data obtained on the stock (table 1), can be claim that the wither height had an average value of 143.10±0.98 cm and the absolute values 139.00-149.00 cm, both of minimum and maximum values being observed on mares.

Average wither height values, regarding males and females, were close, the difference registered between them being only 0.90 cm.

The average withers height value of stallions exceeded the average value of wither height of the entire population by 0.43 cm (0.30%) and the average withers height value of mares by 0.43 cm (0.33%). Regarding this parameter, the coefficient of variation was 1.73%, which indicates that the studied population has a homogeneous character.

Table 1

Results regarding withers height in the horse population studied

Specification	Mares	Stallions	Livestock	Molid I	Molid II	Pilot I	Găman II
n	10	11	21	5	2	3	11
x	143.10	144.00	143.57	144.80	146.00	142.33	142.91
var	9.66	3.20	6.16	7.70	-	9.33	3.69
s	3.11	1.79	2.48	2.77	-	3.06	1.92
SX	0.98	0.54	0.54	1.24	-	1.76	0.58
V%	2.17	1.24	1.73	1.92	-	2.15	1.34
MIN	139.00	142.00	139.00	142.00	144.00	139.00	139.00
MAX	149.00	148.00	149.00	149.00	148.00	145.00	146.00

Depending on the genetic line, it was revealed that the maximum value of wither height was registered on Molid II bloodline (146 cm), and the minimum value on Pilot I (142.33±1.76 cm). The maximum absolute value for this parameter (149 cm) was registered on a mare from Molid I bloodline (5 Molid I-49), and the minimum absolute value (153 cm) was found in case of 11 Pilot I-36 and Găman II-12 mares.

Regarding chest girth circumference, we discovered that the average value of the studied population was 171.48±1.80 cm. The average value of this parameter was 174.90±2.93 cm for mares and 168.36±1.84 cm for stallions, meaning that there was an average difference of 6.54 cm between males and females and 3.88% in behalf of mares (table 2).

The population was homogeneous also regarding chest girth circumference, fact revealed by the 4.82% coefficient of variation.

Depending on the genetic line, can be noticed that the average values of chest girth circumference oscillated between 165.45±1.35 cm (Gaman II) and 180.80±2.42 cm (Molid I). The maximum absolute value for this parameter (189 cm) was registered on a mare from Molid I bloodline (5 Molid I-49) and the minimum absolute value (160) was found at a stallion from Găman II bloodline (Găman II-19).

Table 2

Results regarding chest girth circumference in the horse population studied

Specification	Mares	Stallions	Livestock	Molid I	Molid II	Pilot I	Găman II
n	10	11	21	5	2	3	11
x	174.90	168.36	171.48	180.80	177.00	174.33	165.45
var	85.88	37.06	68.36	29.20	-	56.33	20.07
s	9.27	6.09	8.27	5.40	-	7.51	4.48
SX	2.93	1.84	1.80	2.42	-	4.33	1.35
V%	5.30	3.62	4.82	2.99	-	4.31	2.71
MIN	161.00	160.00	160.00	174.00	174.00	167.00	160.00
MAX	189.00	180.00	189.00	189.00	180.00	182.00	175.00

The cannon girth circumference in the population studied had values that oscillated between 18 and 21 cm, revealing an average of 19.81±0.22 cm (table 3). Depending on sex, the average value of this character was 19.50±0.37 cm on mares and 20.09±0.22 cm on stallions. The maximum absolute value of cannon girth circumference (21 cm) was registered for the two sires, Molid II and Găman II, for the public mount stallion Găman II-17 and for 5 Molid I-49 and 11 Pilot I -36 mares. The minimum absolute value for this parameter (18 cm) was discovered on 3 Molid I-38, 10 Găman II-10 and 12 Găman II-12 mares.

The population was homogeneous also regarding cannon girth circumference, fact revealed by the 5.02% coefficient of variation.

Depending on the genetic line, we revealed that the maximum value of cannon girth circumference was found on Molid II genetic line (20.75 cm) and the minimum value was found on Găman II genetic line (19.50 ±0.31 cm).

Table 3

Results regarding cannon girth circumference in the horse population studied

Specification	Mares	Stallions	Livestock	Molid I	Molid II	Pilot I	Găman II
n	10	11	21	5	2	3	11
x	19.50	20.09	19.81	19.80	20.75	20.33	19.50
var	1.39	0.54	0.99	1.20	-	0.33	1.05
s	1.18	0.74	0.99	1.10	-	0.58	1.02
SX	0.37	0.22	0.22	0.49	-	0.33	0.31
V%	6.04	3.66	5.02	5.53	-	2.84	5.25
MIN	18.00	19.00	18.00	18.00	20.50	20.00	18.00
MAX	21.00	21.00	21.00	21.00	21.00	21.00	21.00

Regarding the massiveness index (table 4), we found that the average value for the studied population was 119.42 ±1.09%. The average value of this trait was 122.19 ±1.60% for mares and 116.91 ±1.07% for stallions, the difference between males and females being of 5.28% meaning that mares are more solid.

The minimum absolute value of massiveness was registered on a stallion (112.68%) and the maximum absolute value was found on a mare (127.47%). The value of 4.20% calculated for the coefficient of variation indicated that the population is homogeneous also regarding this parameter.

Table 4

Results regarding the body indices in the horse population studied

Specification	Mares			Stallions			Livestock		
	MI*	BI**	DTI***	MI*	BI**	DTI***	MI*	BI**	DTI***
n	10	10	10	11	11	11	21	21	21
x	122.19	13.63	11.16	116.91	13.95	11.94	119.42	13.80	11.57
var	25.68	0.60	0.30	12.49	0.28	0.16	25.11	0.43	0.38
s	5.07	0.77	0.55	3.53	0.53	0.40	5.01	0.66	0.61
SX	1.60	0.24	0.17	1.07	0.16	0.12	1.09	0.14	0.13
V%	4.15	5.67	4.89	3.02	3.76	3.38	4.20	4.78	5.30
MIN	114.69	12.50	9.95	112.68	13.01	11.24	112.68	12.50	9.95
MAX	127.47	15.11	12.07	125.00	14.69	12.43	127.47	15.11	12.43

*Massiveness index

**Bone index

***Dactilo-thorax index

The bone index had an average value of 13.80±0.14% for the population. The average value on mares for his parameter was 11.63±0.24% and on stallions was 13.95±0.16%. The minimum value (12.50%) and the maximum value (15.11%) were both registered on mares.

The dactilo-thorax index oscillated between 9.95%, found on a mare and 12.43%, found on a stallion, the average value consisting in 11.57±0.13%.

The results we gathered are specific for Cal de Bucovina breed and within the acceptable limits described in literature.

CONCLUSIONS

Regarding the study made upon the reproduction horses from Cal de Bucovina population, from Lucina studfarm, we gathered the following conclusions:

- the wither height had an average value of 143.10±0.98 cm, the minimum value was 139.00 cm and the maximum value was 149.00 cm;
- the chest girth circumference had an average value of 171.48±1.80 cm, the minimum value was 160 and the maximum value was 189 cm;
- the cannon girth circumference had an average value of 19.81±0.22 cm, the minimum value was 18 and the maximum was 21 cm;
- the massiveness index had an average value of 119.42±1.09%, the minimum value was 112.68 and the maximum was 127.47 %;
- the bone index had an average value of 13.80±0.14%, the minimum value was 12.50 and the maximum was 15.11%;
- the dactilo-thorax index had an average value of 11.57±0.13%, the minimum value was 9.95 and the maximum was 12.43%;

The results we registered are specific for Cal de Bucovina horse breed and within the acceptable limits described in literature.

REFERENCES

1. Burlică M., 2008, Calul Huțul. Editura Alfa, Iași
2. Cucu G.I., Maciuc V., Maciuc D., 2004, Cercetarea ştiinţifică şi elemente de tehnică experimentală în zootehnie. Editura Alfa, Iaşi.
3. Doliş M., Gavrilaş Angela, 2008, Tehnologia creşterii animalelor. Editura Alfa, Iaşi
4. Doliş M – 2008 - Cercetări privind evoluţia unor dimensiuni corporale la tineretul femel din rasa Shagya (Research regarding the corporal dimensions evolution at young females from Shagya race). The 51st scientific conference „Durable agriculture in context of environmental changes" – USAMV Iaşi, Facutatea de Agricultură. Lucrări ştiinţifice vol. 51/2, seria Agricultură, Ed. Ion Ionescu de la

Brad, Iaşi. ISSN 1454-7414, pp. 408-413
5. Doliş M – 2008 - Cercetări privind evoluţia unor dimensiuni corporale la tineretul mascul din rasa Shagya (Research regarding the corporal dimensions evolution at young males from Shagya race). The 51st scientific conference „Durable agriculture in context of environmental changes" – USAMV Iaşi, Facutatea de Agricultură. Lucrări ştiinţifice vol. 51/2, seria Agricultură, Ed. Ion Ionescu de la Brad, Iaşi. ISSN 1454-7414, pp. 414-419.
6. Doliş M – 2009 – Study on the evolution of the body sizes in yong horses of the Shagya breed Cercetări Agronomice în Moldova, vol. XLII; nr.2 (138)/2009, Ed. Ion Ionescu de la Brad, Iaşi, ISSN 0379-5837, pp. 71-78.
7. Doliş M., USTUROI M.G., NAGY P.T., DOLIŞ Luminiţa, 2011 - Study on the evolution of the body height sizes in young horses. Analele Universităţii din Oradea, Fascicula: Ecotoxicologie, Zootehnie si Tehnologii de Industrie Alimentară, vol. X/A, ISSN 1583-4301 (Ed. română) ISSN 2065-3476 (Ed. engleză) ISSN 2065-3484, pp. 149-155.
8. Doliş M. G., Nagy P. T., Nistor C. E., 2014 - Studiu morfologic privind cabalinele de reproducție din rasa Semigreul românesc, de la hergelia Rușețu. Lucrări ştiinţifice, seria Zootehnie, Ed. Ion Ionescu de la Brad, Iaşi, vol. 63/20, pp. 35-39, ISSN-L 1454-7368, CD-ROM ISSN 2284-6964, pp.73-77.
9. Doliș M., Ivancia M., Șonea C.G., Donose R, Nistor C. E,, 2017, Study regarding some body dimensions to horses from Shagya breed from Rădăuți stud farm, Romania. Lucrări ştiinţifice, seria Zootehnie, Ed. Ion Ionescu de la Brad, Iaşi,vol. 68/22, pp.45-49.ISSN-L 1454-7368.
10. Furtunescu A., 1971, Zootehnie generală și genetică. Editura Didactică și Pedagogică, București
11. Iacob L., Viziteu C., Șonea C.G., Doliș M.G., Nacu G., Nistor C. E., 2016, Study regarding the breeding activity of Cal de Bucovina population. Ed. Ion Ionescu de la Brad, Iaşi, vol. 67/22, pp. 170-175, ISSN-L 1454-7368, CD-ROM ISSN 2284-6964, pp.6-11.
12. Mărginean G.E., Georgescu G., Maftei M., 2005, Îndrumător de lucrări practice pentru exploatarea cabalinelor. Editura AgroTehnica, Bucureşti
13. Mărginean G.E. (coordonator), 2012, Tratat de hipologie. Editura Academiei Române, București
14. Moldoveanu G., Radu A., Temişan V., 1961, Aprecierea valorii productive a animalelor după exterior. Editura Agrosilvică, Bucureşti.Negruţiu E., Petre A., Pipernea N., 1969, Genetica şi ameliorarea animalelor, Editura Didactică şi Pedagogică, Bucureşti.
15. Nagy P.T., Gîlcă I., Doliș M.G., Nistor C. E., 2012 - Study regarding some morphologic characters at mares belonging to Romanian Sport Horse breed. Lucrări ştiinţifice, seria Zootehnie, Ed. Ion Ionescu de la Brad, Iaşi, vol. 58/17, pp. 87-90, ISSN-L 1454-7368, CD-ROM ISSN 2284-6964, pp. 263-266 .
16. XXX: Criterii de bonitare privind cabalinele de reproducţie. Monitorul Oficial al Românei, partea I, 29.07.2008.