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DEMOGRAPHIC STUDY ON THE TOTAL SURA DE STEPĂ BREED POPULATION IN ROMANIA**

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ABSTRACT. The research was conducted from August until November 2012 in the districts of Moldavia (Botoşani, Suceava, Iaşi, Vaslui, Bacău, Neamţ, Galaţi and Vrancea), in the West and the Central part of the country (Cluj and Covasna districts) and in the South-East of the country (Tulcea and Brăila districts). The choice of the districts was established based on the informations received from Animal Improvement and Breeding Offices in Romania. The purpose of this research was to identify the effective of Sura de stepă cattle breed in Romania and the evaluation of the phenotypic characters in steppe animals, which belong to the variety of Moldavian breed. The results showed that the Sura de stepă breed consists of a minor part, being raised in just two districts of Moldavia, Iaşi and Neamţ, respectively, as a pure breed with an average of 0,03 % (83 cows), at the Research and Development Station for Cattle Breeding (R.D.S.C.B.) Dancu-Iaşi, with a core of preservation of 59 cows (0,19 %) and at the Holding TCE 3 Brazi Society, Neamţ district, with a core of 24 cows (0,06 %), and under half-breed form with an average of 0,33 % (592 cows). In Harghita, Covasna and Cluj districts, 295 cows from the Sura de stepă breed, Hungarian variety, were identified, excepting being the animals belonging to University of Agricultural Sciences and Veterinary Medicine Cluj, which come from R.D.S.C.B. Dancu-Iaşi, which are Romanian Sura de stepă, Moldavian variety. In Tulcea district, 20 cows of half-breed Sura de stepă and 50 cows of pure breed cattle, Moldavian variety, were identified, from which 24 cows at a private landlord in Pardina locality, Tulcea district, and 26 cows belonging to nine owners from different localities (C.A. Rosetti, Pardina, Chilia Veche, Sfântu Gheorghe, Crişan), each owning 2-3 cows. The analysis of the main body indices showed that the Sura de stepă cows from Pardina, Tulcea county, are of small size and weight, having smaller

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values in all analysed parameters, compared to the Sura de stepă cows from R.D.S.C.B. Dancu-Iaşi from the North-East part of the country, which however fitted the specific limits of the breed, Moldavian variety.

Key words: Cattle; Sura de stepă cattle breed; Inventory; Geographical spreading.

REZUMAT. Studiu demografic asupra populaţiei totale din rasa Sura de stepă din România. Studiul a fost efectuat în perioada august-noiembrie 2012 în judeţele din Moldova (Botoşani, Suceava, Iaşi, Vaslui, Bacău, Neamţ, Galaţi, şi Vrancea), în vestul şi centrul ţării (Cluj, Covasna) şi în sud-estul ţării (Tulcea şi Brăila). Alegerea judeţelor s-a facut pe baza informaţiilor primite de la Oficiile de Ameliorare şi Reproducţie în Zootehnie. Scopul acestei lucrări a fost de a identifica efectivele de vaci din rasa Sura de stepă din Romania şi de a evalua caracterele fenotipice de rasă la animalele care aparţin varietăţii moldoveneşti a rasei. Rezultatele au evidenţiat că rasa Sura de stepă are o pondere foarte mică, fiind crescută doar în două judeţe din Moldova, respectiv Iaşi şi Neamţ, ca rasă curată, în medie 0,03 % (83 capete), la Staţiunea de Cercetare-Dezvoltare pentru Creşterea Bovinelor (S.C.D.C.B.) Dancu-Iaşi, cu un nucleu în conservare de 59 capete (0,19%) şi la S.C. Holding TCE 3 Brazi S.R.L., Neamţ county, cu un nucleu de 24 capete (0,06%), iar sub formă de metişi, în medie 0,33 % (592 capete). În judeţele Harghita, Covasna şi Cluj au fost identificate un număr de 295 animale din rasa Sura de stepă, varietatea maghiară, cu exceptia animalelor care aparţin U.Ş.A.M.V. Cluj, provenite de la S.C.D.C.B. Dancu-Iaşi, care sunt Sura de stepă românească, varietatea moldovenească. În judeţul Tulcea a fost identificat un numar total de 2011 capete metişi din rasa Sura de stepă, 50 capete taurine de rasă curată, varietatea moldovenească, din care 24 capete la un proprietar particular în localitatea Pardina, judeţul Tulcea, iar 26 de capete au fost identificate la nouă proprietari din diverse localităţi (C.A. Rosetti, Pardina, Chilia Veche, Sfântu Gheorghe, Crişan), câte 2-3 capete/gospodărie. Analiza principalilor indici corporali a evidenţiat faptul că vacile din rasa Sura de stepă de la Pardina, judeţul Tulcea, sunt de talie şi greutate mai mici, cu valori medii mai mici la toţi parametri analizaţi, comparativ cu vacile Sura de stepă de la S.C.D.C.B. Dancu-Iaşi, din zona de nord-est a ţării, dar care s-au încadrat în limitele specifice rasei, varietatea moldovenească.

Cuvinte cheie: taurine; rasa Sura de stepă; inventariere; raspândire geografică.

INTRODUCTION

The Sura de stepă breed represents one of the oldest indigenous breeds, which was born from the *Bos Taurus Primigenius*, having as common pattern other Europeans breeds (Andaluza, Romagnola, Zamorana, Salers, Podolica, Ukrainian Sura de stepă, etc.).

In different specialized studies in our country, it was estimated that the actual cattle breeds come from a single wild, *Bos Taurus Primigenius,* called *bour* in Romanian language, which existed until the 17th century. It is supposed that it was tamed in the Neolithic, in the South Alps, in Balkans and Small Asia, and then in Central and West Europe, Africa (Egypt), Iberian Peninsula and the lands of Romania (Transylvania, Moldavia and Wallachia), along with the bison (Creangă and Maciuc,

2010; Creangă *et al.,* 2009; Maciuc *et al.,* 2009).

In our country, until 1850, the cattle effective was formed of two indigenous breeds, the Sura de stepă and Mocăniţa, the first being spread more in steppe areas, being extended until the second half of the 19th century over a very vast geographical area, taking over the entire Old Kingdom, the centre and the West of Transylvania, as well as the centre of Bessarabia, and the other breed spread in mountain areas.

After 1892, along with the first law regarding the import of improved breeds (Simmental, Schwyz, Pinzgau), the indigenous breeds had entered a quantitative reduction process. This being said, in 1935, the Sura de stepă breed had an average of 57,3% of the total cattle effective, and in 1977 of 0,6% (Creangă and Maciuc, 2010).

Under the influence of the environmental conditions from different geographical areas, among the Sura de stepă breed there were differentiated more varieties, which got named according to the area they appeared in: Moldavian, Transylvanian, Bucşană, Ialomiţeană, Dobrogeană. These varieties have interest from an historical point of view, because they represent the basis for the formation of the improved local breeds: Bălţata românească, Bruna, Bălţata cu negru românească.

From the data received from the specialized literature, as well as the official records of The National Agency for Amelioration and Reproduction in Animal Husbandry, the Transylvanian Sura de stepă breed from 1915, the Bucşană and Ialomiţeană varieties from 1950 are no longer to be found nowadays, as they disappeared, being absorbed by other breeds (Creangă and Maciuc, 2010; Creangă *et al.,* 2009; Maciuc *et al.,* 2009).

It was estimated that populations of pure and half-breed Sura de stepă variety could still be found, with a different absorption level, isolated, in the North-East, the South of Moldavia and Danube Delta.

Taking into account the fact that in Romania the Sura de stepă breed can be found fewer than 150 specimens, according to the international standards, it is considered a cattle breed with a certain risk of extinction, being included in a critical category.

From the productive point of view, this breed no longer responds to the actual requests, but due to its historical, economic and genetic role it could have in the future, as a resource of valuable genes, this breed is still very important, fact which imposes the preservation of this biological source as a main priority due to the situation in which it can be found, an almost extinct breed.

The re-evaluation of breeding cattle with a high risk of extinction for the preservation of the valuable genetic fond and the assurance of the genetic diversity of the animals' populations is a current theme which preoccupies the specialists in the field (Chelmu *et al.,* 2007; Creangă and Maciuc, 2010; Creangă *et al.,* 2009; Dascălu *et al.,* 2012; Maciuc *et al.,*

2009; Nicolae *et al.,* 2008; Pântea *et al.,* 2005).

This approach is the major priority, given the conditions in which the extinction process of certain animal populations can irremediably affect the biodiversity of the genetic resources, this being essential for the production of goods of animal origin and the preservation of the planning diversity, as a source of income for the farmers and as an important part of the natural and cultural legacy of a country.

The current state of the problem concerning the cattle preservation of the breeds in danger of extinction determines us to continue these studies and to finding the most modern and efficient preservation methods of these valuable resources in the genetic fond, represented by the Sura de stepă breed.

The present paper has as purpose the achievement of an inventorying study of the total population of Sura de stepă breed for the identification of the total effective of the cattle from this breed, which remained in Romania, and the evaluation of the phenotypic traits of the breed of the animals, which belong to the Moldavian variety.

MATERIALS AND METHOD

The research was achieved from August until November 2012 in the districts of Moldavia (Botoşani, Suceava, Iaşi, Vaslui, Bacău, Neamţ, Galaţi and Vrancea), in the West and the Centre of the country (Cluj and Covasna districts) and in the South-East of the country (Tulcea and Brăila districts). The choice of the districts was based on the information received by the Animal Improvement and Reproduction Offices. Based on the data received from the Offices, the geographical distribution of the cattle was established, in which the population of the Bruna de stepă breed was located, in what the owners and the number of the individuals from the population is concerned, in pure breed or half-breed.

In the areas where the populations of Bruna de stepă cattle were identified, travels were performed to the farms from Moldavia (R.D.S.C.B. Dancu-Iaşi and Holding 3 Brazi Society, Neamţ district) and Pardina, Tulcea county. In these locations owning the Bruna de stepă populations, Moldavian variety, biometric determinations were made in order to establish the phenotypic criteria of the breed and blood samples were taken for the DNA analyses.

RESULTS AND DISCUSSION

Analysing the obtained results, the following breed structure of the Moldavian cattle effective, in pure breed: Bălţată cu negru românească - 46,87%, Brună - 29,27%, Bălţată românească - 19,97%, Pinzgau - 3,18%, Holstein Friza - 0,48%, Montbeliard - 0,07%, Charolaise - 0,04%, Sură de stepă - 0,03%, alte rase - 0,07%.

Concerning this breed structure, it was showed that the population is minor in number, in pure breed of 0,03%, with a total number of 83 cows in two districts, Iaşi and Neamţ, and of 0,33% in half-breed, with a population of 592 animals, localized in the same districts Iaşi and Neamţ (*Tables 1 and 2*).

Table 1 - The structure of the effective breed cattle in the districts of Moldavia and in Brăila district from Romania

Districts	No.	Pure breed, total	Of which:									Half-breed, total	Of which:								
			BR*	B	BNR	HF	PT	CH	MB	SS	Other breeds		BR	B	BNR	PT	AN	SM	BBB	SS	Undefined
Iaşi	No.	**29750**	687	1502	27505	-	-	-	-	59	-	**24334**	730	3844	19220	-	-	-	-	540	-
	%	**100**	2,309	5,04	92,45	-	-	-	-	0,19	-	**100**	2,99	15,79	78,98	-	-	-	-	2,12	-
Vaslui	No.	**22043**	185	1943	18450	1280	-	-	185	-	-	**17500**	-	-	16445	-	-	-	-	-	1055
	%	**100**	0,8	8,8	83,7	5,9	-	-	0,8	-	-	**100**	-	-	93,9	-	-	-	-	-	6,1
Bacău	No.	**24559**	2666	18814	3079	-	-	-	-	-	-	**22849**	3905	17143	1773	28	-	-	-	-	-
	%	**100**	10,85	76,60	12,53	-	-	-	-	-	-	**100**	17,09	75,02	7,76	0,12	-	-	-	-	-
Galaţi	No.	**16574**	-	-	16468	-	-	-	-	-	-	**9987**	-	159	9828	-	-	-	-	-	-
	%	**100**	-	-	62	-		0,4	-	-	-	**100**	-	1,59	98,40	-	-	-	-	-	-
Neamţ	No.	**36571**	5510	24664	5910	-	463	-	-	24	-	**18787**	2088	11114	4100	780	180	178	295	52	-
	%	**100**	15,06	67,44	16,16	-	1,26	-	-	0,06	-	**100**	11,11	59,15	21,82	4,15	-	-	-	0,27	-
Brăila	No.	**27966**	45	-	27921	-	-	-	-	-	-	**1474**	-	-	1474	-	-	-	-	-	-
	%	**100**	0,16	-	99,84	-	-	-	-	-	-	**100**	-	-	100	-	-	-	-	-	-
Vrancea	No.	**20447**	570	17161	2716	-	-	-	-	-	-	**11010**	2693	6025	1316	-	-	-	-	-	976
	%	**100**	2,80	83,90	13,30	-	-	-	-	-	-	**100**	24,46	54,72	11,95	-	-	-	-	-	8,87
Botosani	No.	**35100**	2010	60	14940	-	-	-	-	-	-	**27020**	16000	-	11020	-	-	-	-	-	-
	%	**100**	57,3	0,2	42,5	-	-	-	-	-	-	**100**	59,2	-	40,8	-	-	-	-	-	-
Suceava	No.	**54180**	23610	14070	8260	-	8040	-	-	-	200	**46150**	17250	11240	8730	8420	-	-	-	-	510
	%	**100**	43,57	25,97	15,24	-	14,84	-	-	-	0,37	**100**	37,37	24,35	18,92	18,24	-	-	-	-	1,10
Total	No.	**267193**	53373	78214	125249	1280	8503	106	185	83	200	**179111**	42666	49525	73906	9228	180	178	295	592	2541
	%	**100**	19,97	29,27	46,87	0,48	3,18	0,04	0,07	0,03	0,07	**100**	23,82	27,65	41,26	5,15	0,10	0,10	0,16	0,33	1,42

*BR – Bălţată românească; B – Brună; BNR – Bălţată cu negru românească; HF – Holstein Friza; PT – Pinzgau; CH – Charolaise; MB – Montbeliard; SS –Sură de stepă; AN –Aberdeen Angus; SM – Simmental; BBB – Blanch Blue Belgian.

Table 2 - The demographic distribution of the Sura de stepă cattle, in pure breed and half-breed in the districts of Moldavia and in Brăila district from Romania

Districts	No.	Pure breed total	Of which: Sura de stepă	Half-breed total	Of which: Sura de stepă
Iaşi	No.	29750	59	24334	540
	%	100	0,19	100	2,12
Vaslui	No.	22043	-	17500	-
	%	100	-	100	-
Bacău	No.	24559	-	22849	-
	%	100	-	100	-
Galaţi	No.	16574	-	9987	-
	%	100	-	100	-
Neamţ	No.	36571	24	18787	52
	%	100	0,06	100	0,27
Brăila	No.	27966	-	1474	-
	%	100	-	100	-
Vrancea	No.	20447	-	11010	-
	%	100	-	100	-
Botoşani	No.	35100	-	27020	-
	%	100	-	100	-
Suceava	No.	54180	-	46150	-
	%	100	-	100	-
Total	No.	213010	83	179111	592
	%	54,32	0,04	45,67	0,33

It was also observed that in the district of Iaşi the majority of cattle from the Sura de stepă breed were raised at the Research and Development Station for Cattle Breeding (R.D.S.C.B.) Dancu-Iaşi, which owns the most numerous effective of Sura de stepă breed, Moldavian variety, 59 cows (0,19%), of which 43 cows, two heifers, four mounted heifers, five heifers of 12-18 months, two heifers of 0-6 months and three growing males.

R.D.S.C.B. Dancu-Iaşi, through the alignment to the national and worldwide FAO program concerning the preservation and the management of the genetic resources, has as main priority the reevaluation of the cattle breeds in danger of extinction, as the Sura de stepă breed is for the preservation of this valuable genetic fond. In this context, in 2002, a core of Sura de stepă cattle was created by buying a number of 20 cows , youth female over 12 months and two males over 18 months from R.D.S.C.B. Mărgineni, district of Neamţ. From 2002, a conducted mating program was used, the cows from the core of Sura de stepă breed being inseminated with frozen semen from Sura de stepă breed bulls: 79004-NAVOD, 79005-NUFAR, 79006- NUFAR, 79007-NECAZ, 79008- NAMOL, 79009-

NAIV, SURAFORT 1, SURAFORT 2, SURAFORT 3.

Two bulls, obtained in the R.D.S.C.B. Dancu-Iaşi from cows inseminated with frozen semen from the bull 79008, were sold to the Jucu farm, the district of Cluj.

To avoid the genetic drift and to assure the genetic stability of the resulted copies, conducted breeding programs were used, following the maintenance of the Sura de stepă breed effective to a minimum of 50 cows.

In the district of Neamţ, the cattle from the Sura de stepă breed raised in pure breed, can be found in the private sector, at the Holding TCE 3 Brazi farm, in a number of 24 cows, which employs frozen semen for artificial insemination from the following bulls: code RO:20151-JIMY, registration number RO295000098327, and code RO: 20139-FRUMUSEL, registration number RO294000098004.

Under the form of half-breed Sura de stepă there can be found 0,27% of cases at different private owners.

In the district of Tulcea, a total number of 2011 half-breed cows and 50 cows of pure Sura de stepă, Moldavian variety, was identified according to the data received from The Animal Improvement and Reproduction Office.

From a total of pure Sura de stepă breed, a number of 24 heads was identified at a private owner from Pardina locality, situated on the right bench of Chilia Veche, at 37 km from Tulcea. For reproduction, the natural breeding with two bulls of 3-6 years was employed (RO384000043735; RO386000043723; RO38900100227).

The animals are raised in a natural environment, on fields, in winter as well as in summer, the feeding consisting in natural herbs from the pastures, supplemented by hay of lucerne and ground corn, both in winter and summer.

The conducted studies in the West and the central part of the Romania, Cluj and Covasna districts, indicated the cattle populations belonging to the Hungarian Sura de stepă breed, which come mainly from Hungary.

The breeders from these areas prefered this breed due to the reduced costs for the maintenance. The animals are raised in the extensive system on natural pastures, in the majority of cases the animal ratio is not supplemented by concentrated feed. During the cold season, meaning from November to March, the animals are held outdoor, in shelters provided with shed and they are fed with roughage (hay, straw). The animals don't need shelter but during the cold season, in rainy days or when the temperatures are very low. Concerning the animal reproduction, the breeding is used, and also the switching of the bull in a certain interval of time, in order to avoid the inbreeding. The majority of farmers has a core effective, and the calves are destined to slaughter, the Sura de stepă breed being raised for meat. For these reasons, the costs concerning the

labour are reduced. None of the breeders raised any reproduction or calving problems, the intervention of a vet being unnecessary.

In the farms where the population of the Sura de stepă breed from Moldavia was identified (in R.D.S.C.B. Dancu-Iaşi) and in Tulcea district, Pardina farm, different biometric determinations were made to identify the phenotypic traits of the breed and blood samples were taken for genetic analyses.

The investigations showed some variations of the morphological traits analysed in the areas of spreading of the Sura de stepă breed, which were situated generally in the specific limits of the breed.

The analysis of the results concerning the body development of the Sura de stepă breed from R.D.S.C.B. Dancu-Iaşi showed the following medium values of the main morphological parameters:

- *average size of cows of* 122± 1,60 cm, with variations between 114-127cm;
- *average height at croup of* 125±2,50 cm, with variations between 118-130 cm;
- *diagonal length of the trunk* of 154,90 ±2,90 cm, with variations between 139-170 cm;
- *croup width at hips,* of 49,83±0,50 cm, with variations between 43-57 cm;
- *croup width at artic. coxo-femoral,* of 43,76±0,42 cm, with variations between 40-51 cm;
- *croup width at ischia,* of 16,90±0,0,42 cm, with variations between 13-22 cm;
- *thorax perimeter,* of 189±0,2,18cm, with variations between 158-207 cm;
- *body weight,* of 542,86±18,45 kg, with variations between 390-710 kg., favourable to the selection concerning the meat production (*Tab.3*).

Table 3 - The medium values and the estimated statistics of the main morphological parameters in the Sura de stepă breed from R.D.S.C.B. Dancu-Iaşi

Specification	UM	n	$\overline{X}$	±s $\bar{x}$	s	V%	Min	Max
Withers height	cm	40	122,00	1,60	2,96	4.51	114,00	127.00
Croup height	cm	40	125,00	2,50	2,93	3,60	118,00	130,00
Height to the tail	cm	40	126,50	3,58	3,30	3,49	119,00	132,00
Depth of the thorax	cm	40	69,50	2,71	2,97	4,60	64,00	80,00
Diagonal length of the body	cm	40	154,90	2,90	8,43	4,59	130,00	170,00
Rump width at hips	cm	40	49,83	0,50	2,70	5,41	43,00	57,00
Rump width at artic.coxo-femoral	cm	40	43,76	0,42	2,27	5,20	40,00	51,00
Croup width at ischia	cm	40	16,90	0,42	2,27	13,45	13,00	22,00
Thorax perimeter	cm	40	189,00	2,18	11,75	6,22	158,00	207,00
Whistle bone perimeter	cm	40	18,07	0,15	0,82	4,54	17,00	20,00
Body weight	kg	40	542,86	18,45	99,38	18,30	390,00	710,00

The biometric determinations indicated a good body growth, which corresponds to the limits of the breed.

The phenotypic analysis of the population of the Sura de stepă breed from R.D.S.C.B. Dancu-Iaşi indicated the fact that the individuals show characteristic traits of the breed, Moldavian variety: the typical conformation to the type of milk, elongated *head*, thin, often straight profile, slightly convex, especially in males, *the horns* have various forms, most commonly under the shape of the pound, proportional croup, diagonal in general, *colour* ranging from silver white to dark grey or light grey, darker shade, to black, in some areas of the body, especially in the ears, back, around the eyes, the area between the ears. The horns are bicolored, white with a black spot. The colour in calves is slightly red, which turns to grey under the influence of the sun, around the age of 2 months (*Fig. 1*).

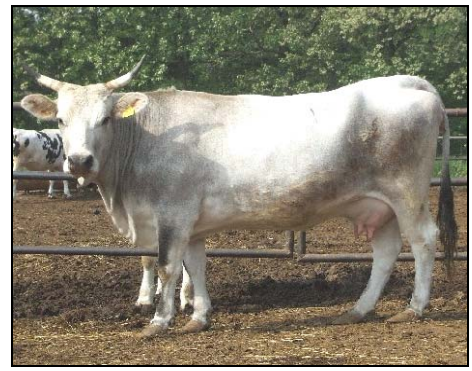

Figure 1 - Sura de stepă cow from R.D.S.C.B. Dancu-Iaşi

From the analysis of the main morphological traits of heritability, the values for the body weight are showed (h^2 = 0,41) and withers height (h^2 =0,37), which shows a good genetic consolidation of the studied core, the phenotypic selection for these characters being efficient.

The repeatability of the analysed traits shows the same good genetic consolidation of the Sura de stepă breed and the possibility of the improvement through a phenotypic selection (*Tab. 4*).

Table 4 - Heritability (h^2) and repeatability (R) of the primary morphologic traits in Sura de stepă cows from R.D.S.C.B. Dancu-Iaşi

Specification	Heritability (h^2)	Repeatability (R)
Withers height	0,37	-
Thorax perimeter	0,33	-
Body weight	0,41	-

The studies achieved by Creangă and Maciuc (2010) concerning the Sura de stepă population from R.D.S.C.B. Dancu-Iaşi indicated, as well, a good body development of the genetic groups, with values for the body weight between 549,38 kg (87027) and 626,67 kg (code 79005). The data were estimated as being favourable to the selection of the Sura de stepă population concerning the improvement of the meat production.

At the Holding TCE 3 Brazi Society, district of Neamţ, after the external estimation of the core of Sura de stepă breed, it resulted that it presents the phenotypic traits specific to the breed, the Moldavian variety, in what the conformation, body shape and colour is concerned (*Fig. 2*).

Figure 2 - Sura de stepă cows from Holding TCE 3 Brazi Society, Neamţ district

Figure 3 - Sura de stepă cow and calf from Pardina, Tulcea district

The studies concerning the main morphological parameters in Sura de stepă cows from the farm of Pardina, Tulcea district, indicated some variations, which were situated in the breed's limits, having the following medium values:

- *average size of cows of* 120,35± 1,60 cm, with variations between 111-145 cm;
- *average height at croup of* 118±1,08 cm,with variations between 114-123 cm;
- *diagonal length of the trunk of* 130,85 ±2,35 cm, with variations between121-139 cm;
- *croup width at hips*, of 36,4±0,87 cm, with variations between 32-39 cm;
- *croup width at artic.coxo-femoral*, of 34,42±1,13 cm, with variations between 31-38 cm;
- *croup width at ischia*, of 16,71±0,077 cm, with variations between 15-21 cm;
- *thorax perimeter*, of 168,42±3,99 cm, with variations between 158-188 cm;
- *body weight*, of 393, 42±28, 42 kg, with variations between 335-540 kg (*Fig. 3 and Tab.5*).

The estimation of the external traits, typical conformation, fine body shape, the colour, the size, the special resistance to all environment factors, leads to the analysed population of the farm cattle having the traits of the Sura de stepă breed, Moldavian variety.

Table 5 - The medium values and the statistical estimations of the main morphological parameters in Sura de stepă breed from Pardina farm, Tulcea district

Specifications	Wither height	Back height	Croup height	Tail base height	Torax depth	Height at sterne	Diagonal length	Horizontal length	Croup length	Thorax length	Head length	Thorax perimeter	Whistle bone perimeter	Croup width at hips	Croup width at art. coxo-femoral	Croup width at ischial	Head width	Chest width	Body weight
UM	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	Kg
1075	145	121	119.5	118	83	62	135	148	36	66	37	188	17.5	37	32	17	15	33	540
2488	118.5	112	117	114	57.5	61	130	105	31	62	39	158	14.5	38	31	15	20	27	345
4011	119	117.5	123	124	52	67	139	131	40	75	43	173	17	35	38	21	23	32	420
3704	116	115	114	115	54	62	125	118	31	62	41	161	16	32	31	17	17	28	335
2323	111	118	116	116.5	47	64	121	109	27	63	42	162	16.5	37	36	16	20	32	340
3910	113	114.5	118	118	53	60	131	111	33	67	42	163	17	39	36	15	21	30	348
2051	120	121	119	119	54	66	135	136	30	75	45	174	17.5	37	67	16	26	32	426
N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
$\overline{X}$	120.35	117	118.0	117.78	57.21	63.14	130.85	122.57	32.57	67.14	41.28	168.42	16.57	36.42	34.42	16.71	20.28	30.57	393.42
$\pm s_{\overline{x}}$	4.29	1.27	1.08	1.23	4.45	0.98	2.35	6.06	1.61	2.15	0.99	3.99	0.39	0.868	1.13	0.77	1.37	0.86	28.42
s	11.35	3.37	2.86	3.26	11.79	2.6	6.22	16.05	4.27	5.69	2.62	10.56	1.05	2.29	2.99	2.05	3.63	2.29	75.19
V%	9.43	2.88	2.42	2.77	20.61	4.13	4.76	13.09	13.12	8.48	6.36	6.2	6.38	6.31	8.69	12.31	17.93	7.52	19.11
Min	111	112	114	114	47	60	121	105	27	62	37	158	14.5	32	31	15	15	27	335
Max	145	121	123	124	83	67	139	148	40	75	45	188	17.5	39	38	21	26	33	540

The comparative analysis of the main body indices showed that the Sura de stepă breed cows from Pardina farm, Tulcea district, are of a smaller size, recording smaller medium values in all the analysed parameters, compared to the cows from R.D.S.C.B. Dancu-Iaşi from Moldavia, being framed in the specific limits of the breed, Moldavian variety (*Tab. 6*).

Table 6 - The comparative results regarding the main body indices in Sura de stepă cows from Moldavia (RDSCB Dancu-Iaşi) and Tulcea district, Pardina farm

Specification	UM	Pardina farm, Tulcea district $\overline{X}$	R.D.S.C.B. Dancu-Iaşi Iasi $\overline{X}$	Differences ± Pardina Farm/ R.D.S.C.B. Dancu-Iaşi
Wither height	cm	120.35	122.00	-1.65
Croup height	cm	118.0	125.00	-7
Tail base height	cm	117.78	126.50	-8.72
Thorax depth	cm	57.21	69.50	-12.29
Diagonal length of the body	cm	130.85	154.90	-24.05
Croup width at hips	cm	36.42	49.83	-13.41
Croup width at art. coxo-femoral	cm	34.42	43.76	-9.34
Croup width at ischia	cm	16.71	16.90	-0.19
Thorax perimeter	cm	168.42	189.00	-20.58
Whistle bone perimeter	cm	16.57	18.07	-1.5
Body weight	kg	393.42	542.86	-149.44

CONCLUSIONS

The results of the study showed that the Sura de stepă breed, Moldavian variety, is smaller in number, being raised in just two districts of Moldavia, Iaşi and Neamţ, as a pure breed with an average of 0,03 % (83 cows) and under the form of half-breed with an average of 0,33 % (592 animals).

In Covasna and Cluj districts, it was identified a number of 295 half-breed Sura de stepă, Hungarian variety.

In Tulcea district it was identified a total number of 2011 half-breed Sura de stepă cows and 50 pure breed cattle cows, Moldavian variety, of which 24 cows at a private owner in Pardina, Tulcea district, and 26 cows were identified at nine owners from different locations, each having 2-3 cows.

The analysis of the main body indices showed that the Sura de stepă cows from Pardina farm, Tulcea district, have smaller medium values in all analysed parameters, compared to the Sura de stepă cows from the North-East part of the country, but which have the specific limits of the breed, Moldavian variety.

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