

## Sura de Stepă Breed

[GADDINI A,, DASCALU D.-L. (2018) La Sura de Stepa. *Eurocarni*, 3: 72-79]

<http://www.pubblicitaitalia.com/eurocarni/2018/3/16469.html>

English translation by Andrea Gaddini (andgad@alice.it)

Sura de Stepă (Grey Steppe) is a Romanian cattle breed endangered of abandonment, belonging to Podolian strain, a group of grey breeds with great rusticity and resistance to adversities. Like all the Podolians, it had a triple purpose, with a prevalence for draft, about which it was very reputed in the Balkans. In 1860 it counted more than 2.6 million heads and five ecotypes, in different parts of Romania, but with the introduction of foreign breeds and farm mechanization it had a sudden decline, and became dual-purpose, with the prevalence of meat production.

### History

Several sources agree in reporting that for centuries in present-day Romania there were two sorts of cattle, a small-sized and short horned (*brachicerous*), living on the mountains, and a larger and long-horned one, living in the plain. Archeozoological surveys on medieval sites (*Bejenaru*) have identified cattle remains similar to the Sura de stepă type, with an average withers height of 112 cm, with short horns, which in the remains found in Dobrogea, in the Danube delta area, were longer.

The work also noted a slight size reduction in cattle between the 14th and 17th centuries, due to the strong exportation of the best specimens to Western Europe and Ottoman Empire, or for a crisis in fodder production due to the cooling of the climate of the end of the period.

In 1714 Dimitrie Cantemir in his "*Description of Moldavia*" related of small mountain cattle and large herds of strong plains cattle, of which forty thousand heads a year were sold in Gdansk, Poland, from where they were sold as Polish cattle in the neighboring regions.

In 1880 there were two breeds, the Sură de stepă, of Podolian strain, and largely prevalent, and the Mocănița, a mountain brachicerous, which lived in Transylvania, Banat and Bucovina. Also Nicolae Filip (1864-1922) distinguished in 1900 a large breed, with lyre horns and grey coat, and a smaller one with crowned horns, concave profile and protruding eyes.

In the 1951 edition of his Dictionary of Livestock Breeds, Mason distinguished the Mocănița, mountain brachicerous, with a fawn or grey coat, and the Romanian steppe, with four varieties, corresponding to the ecotypes of the Sură de stepă, except for Dobrogeană.

In 1909 in Neamt district, in Moldova, a bullock farm was built, for the nearby Popăuți bulls center, but the crisis, due the importation of improved breeds, thanks to a law of 1892, was already underway. After the First World War, substitution crossings created Bălțată Românească (Simmenthal type), Bruna de Maramureș, (Schwyz bulls on Sura de stepă and Mocănița), and Transylvanian Pinzgauer (Austrian Pinzgauer bulls on Sură de stepă). In 1934 Usuelli, who was in Romania to follow the acclimatization of the Romagnola Gentile, noted that the substitution crossings, widespread in the Balkans, were followed in the country with great care, while Bonadonna in 1950 deemed that Moldavian was only crossbred by Romagnola, considered as better than Charolaise and Simmental.

In 1935 Sura and Mocănița were 57.3% of the Romanian cattle, in 1955 47.3%, of cattle with functional controls on 776 animals, and in 1960 were 32%, while Simmenthal and its crossbreds were 38%. In 1969 Sura de stepă was 11.5%, and in 1977 only 2.1%. In 1986 it had only 513 heads, with 13 bulls, and 60 females registered in the herdbook,

and in 1987 it was only present in the Tulcea district

Nowadays, most of the purebred animals are in Moldova, at the "*Stațiunea de Cercetare Dezvoltare pentru Creșterea Bovinelor*" (Research Center for the Cattle Development) in Dancu, commune of Holboca, Iași county. The nucleus was established in 2002, with the purchase of 20 cows and heifers over 12 months, from the Mărgineni Research Center for cattle breeding, in the district of Neamț, closed after the end of the socialist regime, for the laws on the return of State land to the former owners. Since 2002 a plan of programmed matings is in progress, with the use of frozen semen.

Other animals, morphologically similar to the Moldavian ecotype, but of uncertain genealogy, are found in the Danube delta: 162 adult animals, and 171 young cattle, are in Pardina, Tulcea district, on the right bank of the Chilia Veche, where natural mating is performed by two Grey steppe bulls from Hungary aged 3 and 6 years.

In Harghita, Covasna and Cluj districts in Transylvania, breeders of Magyar ethnic group hold 556 heads of Hungarian Grey, 374 females, 9 males and 173 young cattle. Isolated specimens are in holdings of the Eastern Carpathians (Neamț, Bacău, Vrancea).

Further 24 purebred and 52 crossbred cows were raised until 2014 by the TCE 3 Brazi holding, in Dărmănești, Piatra Neamț municipality, Neamț district, in Moldova, which used artificial insemination, and in 2004 obtained 16 embryos with embryo transfer on Holstein and Bălțată Românească heifers.

In 2015 Bălțată Românească was 30.96% of the Romanian cattle, Bălțată cu negru Românească (Holstein strain) was 20.28%, Bruna de Maramureș 13.58%, Sura de stepă purebred were 0.03 % (83 cows), and 592 crossbreds 0.33%.

## The five ecotypes

The most representative was **Moldovenească**, the only one left today, widespread in western Moldavia, a region that borders the Republic of Moldova, and has as its emblem a bull's head, as well as in Muntenia, Oltenia and Dobruja. It had a great aptitude for draught, with big, sturdy oxen, incomparable with other breeds for resistance, hardiness, adaptability to the environment. They worked tirelessly for tens of kilometers, in winter frost and in summer heat. Two Moldavian cattle could plow half a hectare per day, and a household could cultivate 15 or 20 hectares,

Mostly widespread in central Moldavia, **Bucșană** was similar to the Moldavian, with which it often shared the area, being anyway smaller and darker. Withers height did not exceed 130-135 cm, its head was short and thin, almost point-shaped towards the muzzle, which was black. It had a wide forehead, small black ears, small and lively black eyes, short and lyre-shaped horns, with white-greyish base and black tip, rather fine and smooth, short and thin neck, with poorly developed dewlap, deep and wide trunk, with pretty arched ribs, clean withers, usually straight back, short limbs, small and black hooves, good musculature, hard and thick skin (30-35 kg), though easily detachable from the subcutaneous tissue.

The foretrunk was slightly higher than hindtrunk, not very muscular, with a low base of tail. The udder was poorly developed and hairy; the coat was long and coarse, with various shades of grey, darker than in the Moldavian, with black apical pigmentation, particularly in bulls, and almost black end parts of the limbs, sides of the neck, chest and abdomen.

For their color these animals were known as "*porumbe*" or "*hulube*" (pigeons). The milk production was similar to Moldavian, but the oxen were heavier, slower and had a shorter pace. It had a more distinct beef aptitude, with higher daily growth, muscularity

and dressing percentage (45-55%), due to the lower proportion of bones on the carcass. Bucșană cattle, slaughtered in Rome, had yields of 54%, meat of nice appearance and taste and good marbling of fat. Probably this ecotype disappeared around 1950.

The **Transilvăneană** (grey or white Transylvanian), was until 1880 the only breed in the region, which until 1918 belonged to Hungary. It was very similar to Hungarian Grey, although for Hönsch it was more similar to the Romagnola. It was hypermetric, with withers height of 140-155 cm and weight of 400-500 kg, with peaks of 600-700 kg. It had a large, elongated head and large lyre-shaped horns, which reached 80-100 cm in bulls, long neck, abundant dewlap, prominent withers, long back, long and powerful limbs, and grey, silver or white coat. The attitudes were work and meat, and to a lesser extent milk. In 1950 it was still present in the districts of Arad, Sălaj, Satu Mare and Cluj.

The **Ialomiteana** was widespread in the south of the country, in the plain of Bărăgan, and in the districts of Ialomița, Brăila and Vlașca. It was a crossbred between Moldava, Mocănița and Transylvanian, brought by mountain populations, settled in the area, and therefore it had intermediate traits, though more similar to Transylvanian. The animals were light, long and had shorter, and lyre-shaped horns wider than Moldavian, and a light grey coat. The back was oblique, with sloping rump. It was suitable for work, but not for fattening, with milk production of 7-8 kg/day. It disappeared in the 1950s.

The **Dobrogeană** derived from the Bulgarian Podolian breed of the Isker river valley, then spread in southern Dobruja, giving origin to Dobrugian Red, by means of absorption crossings. It had a reduced size compared to the other ecotypes, with withers height 115-120 cm, and weight of 250-350 kg, white coat, similar to Bucșana, well grown thorax and dewlap, short limbs, short and straight horns, but often crown-shaped or irregularly shaped. Milk production was higher than in other ecotypes, reaching 10-12 kg/day, with 3.5-4.5% fat. It was not suitable for heavy work and meat production was low, with slaughter yield similar to Moldavian.

### **Current morphology of the breed**

The trunk is narrow with a more developed foretrunk, which is sturdy and sometimes coarse and compact. The head is long, narrow and expressive, with a straight profile, sometimes slightly convex, especially in bulls, with wide horns of various shapes, often in lyre, neck well-connected with head and trunk, high and narrow withers. The rump is sloping, the limbs are well developed, with strong joints, tough hooves and frequent defects as knock-kneed, sickle-hocked, outwardly rotated feet.

The coat is grey or silver grey, very light to dark, with darker pigmentation on the forelimbs, back and forehead. Ears, nostrils, end of the limbs, mucous membranes, eyelashes, muzzle, tuft of the tail, skin and hooves are black. The horns are white with black tips. The calves are fawn at birth and at two or three months of age start to change their coat to grey.

The withers height in the Moldavian ecotype was 130-135 cm for bulls and 118-122 for cows. Filip in 1900 reported that the Moldavian had a weight of 500-600 kg for bulls, 400-500 kg for oxen and 300-400 kg for cows (372 kg in 1961 and 415 kg in 1982). Currently the average weight of cows is 542.86 kg, with peaks of 710.00, while in bulls it ranges from 549.38 to 626.67 kg. The average dressing percentage is 51.55%, with 53-55% in the best specimens, and 47.23% for cows. The average daily growth of males was 700-800 g. The average chest girth increased from 167.13 cm (1925) to 189 cm (2009). In Pardina the size is smaller than in Dancu, as shown in the table:

Morfological parameters (cows)	Dancu		Pardina	
	<i>average</i>	<i>interval</i>	<i>average</i>	<i>interval</i>
Withers height (cm)	122± 1.60	114-127	120.35± 1.60	111-145
Rump height (cm)	125±2.50	118-130	118±1.08	114-123
Tail height (cm)	126.50±3.58	119-132		
Diagonal length of the body (cm)	154.90 ±2.90	139-170	130.85 ±2.35	121-139
Rump width at hips (cm)	49.83±0.50	43-57	36.4±0.87	32-39
Rump width at coxofemoral artic. (cm)	43.76±0.42	40-51	34.42±1.13	31-38
Croup width at ischia (cm)	16.90±0.42	13-22	16.71±0.077	15-21
Thorax perimeter (cm)	189±2.18	158-207	168.42±3.99	158-188
Thorax depth (cm)	69.50±2.71	64-80	57.21	
Shin perimeter (cm)	18.07±0.15	17- 20	16.57	
Live weight (kg)	542.86±18.45	390-710	393.42±28.42	335-540

## Productions

In 1900, according to Filip, the average daily milk production at the peak of lactation was 10 kg, with 4-5% fat, which in some cows reached 6-7%, and the butter from the milk of the Moldavian cows was high quality and very aromatic. In the 1950s, in household farms the yield was 800-900 kg with 4-5% fat per lactation of 210 days, while in large farms it reached 1,500-2,000 kg, with a record of 4,008 kg in normal lactation, at the Popăuți Institute of Zootechnical Research, in Botoșani district. At the Bucharest School of Agriculture, Moldavian cows produced 12-15 kg of milk a day.

Today, in the first lactation, the yield is 1,589.64 kg, 62.69% of the maximum (the fifth one, of 2,535.43 kg), an index of tardiness for milk production. The variability of the production is however very wide, 544.10 kg in the first lactation and 1,185.89 in the fifth, leaving chances for great improvements. Lactation does not exceed 305 days. The average fat content is 4.71%, and average proteins are 3.71%, both in fifth lactation. It should be noted that in Romania there is no tradition of cow milk cheese, and milk is therefore mainly used as a drink.

According to Filip (1900) the Moldavian ecotype was late-maturing, with full somatic development at 5-6 years, while currently the reproductive maturity is 30-32 months, with first calving in average at 39.03 months varying between 22 and 58 months. Fertility is 86.8% and birth rate is 63.0% for the whole population and 72.6% for the artificially inseminated cows. The gestation is between 275 and 282 days and the calving interval is about 400 days. The breed is long-lived, it keeps yielding for 11-12 years, but in Dancu a cow has calved at 22 years. Calving is natural, without veterinary intervention, except for rare cases of dystocia, placenta retention and other postpartum problems. The calf at birth weighs 27-30 kg.

## Rusticity

The breed has a lively temperament and rusticity and resistance to climatic adversities and diseases, in particular tuberculosis, brucellosis and leucosis. The veterinarian intervenes almost exclusively for vaccinations. The farmers choose it for its low cost of management, since it grows grazing, with supplements, not always necessary, of coarse fodder and feed (straw, lucerne hay, ground maize grain). From November to March the animals are free pasturing, with shelters with a roof, at disposal, only on rainy

or very cold days. The cows have a strong maternal instinct, which also pushes them to attack, when they consider their calf in danger, and do not release their milk except in the presence of the calf.

### **Comparisons with other breeds**

Georgescu *et al.* (2009), using microsatellites as markers, demonstrated the diversity of the Sura from Simmental, Friesian, Brown and Montbéliarde. Ilie *et al.* studied the differences between Sura, Bruna, Bălțată Românească and Bălțată cu negru, using 11 specific microsatellite markers and a 638 bp mtDNA D-loop. A high genetic variability emerged: despite the reduced census, all three haplogroups T3, T2 and T1 were identified, and on 32 animals, 18 haplotypes were found, more than those found in other Podolians, Istrian, Slavonian-Syrmian, Bulgarian Grey, Serbian Podolian and Ukrainian Grey, a clue of a high genetic variability (0.927) of the maternal component of the breed. In this work the Sura shares in two cases 12 haplotypes with Hungarian Grey, and in one case haplotypes with Podolians (Hungarian, Bulgarian and Ukrainian Grey, Istrian and Slavonian-Syrmian), Brahman (zebu) and Portuguese (Maronesa, Ramo Grande) and Spanish breeds (Palmera).

The  $\alpha$ S1-casein IRV polymorphism has been identified, never found in European breeds, including Podolians, but isolated in the African Kuri breed and in Nepalese taurine cattle. This allele is an important marker for studies on the origin of breeds.

### **Protection**

The Herdbook was established in 1924, before the decline. The first initiative to protect the breed took place in 1963, with the storage of 4,000 semen doses, from the last elite farm of the breed in Popăuți, in Botoșani district, which went lost in the 1970s. The Semtest of Balotești has acquired frozen semen.

In winter 1981, the State farm I.A.S Dumbrava, in Targu Neamț, in Moldova started a program comparing cattle from holdings in the mountain area of the Neamț district and surrounding areas. A small nucleus of heterogeneous-looking cattle emerged, with coats between lead grey and off-white, attributable to Sura de Stepă and Mocăniță, with several crossbreeds.

The breeders' association "*Asociația Crescătorilor de Vaci de Lapte Holboca-Iași*", based in Dancu Center, holds the herdbook, which is divided into a section for the 48 purebred heads with proven genealogy (33 females, 2 males and 13 calves, of which 4 males and 9 females), and one with about 500 heads of Pardina and the Hungarian Greys.

Two cows from Dancu Center, Miranda, 12 years, and Mandiga, 11 years old, were exhibited at Agralim 2017 agricultural fair, in the agri-industrial Park TransAgropolis in the municipality of Lețcani, Iași district. raising the appeal and curiosity of visitors.

The national coordinator for the protection of the breed is Dr. Livia Vidu, of the Faculty of Animal Sciences of the University of Bucharest. Sura de Stepă has been inserted by Slow Food Foundation into the Ark of Taste, which collects traditional products and local breeds. However, the meat of the breed is not appreciated in the native area. The price of a cow is between 1,500 and 2,000 euros.

### **Perspectives**

The latest works indicate that the genetic variability of the breed has been preserved, due to the low selective pressure for the production traits. The heritability of body weight and withers height show a good genetic consolidation, a clue of a cautious phenotypic selection until now, based on these characteristics, with a possibility of improvement, also for milk, due to the high variability of production among the specimens.

The Consens 120/2012 Partnership Program started the collection and conservation of gametes, muscle tissue, stem-cells of fibroblast lineages, blood for genetic testing, constituting a gene bank. The Dancu animals have been phenotypically and genetically characterized in order to identify SNPs (Single Nucleotide Polymorphisms). At the SCDCB in Arad, oocytes were collected and stored from slaughtered cows, then cryopreserved in Dancu.

The conservation program aims to preserve the rusticity and resistance of the breed, both for low environmental impact breeding and for industrial crossings with improved Podolians or other specialized beef breeds, transferring them the positive traits.

To achieve this it is necessary to maintain and expand a purebreds nucleus, not subjected to intense selection, to avoid losing the positive traits of resistance and low-cost management, given the low number of heads available, but aiming to increase the body size and the precociousness, maintaining the milk attitude, with greater productions and milking ease. Therefore the somatic peculiarities that the breed currently holds must be safeguarded, excluding the defects and deviations from the breed characters. Morphological variants, "green" or "lyre" horns, dark coat, small size, are as important as biochemical polymorphisms as characteristic of the primitive type.

**Andrea GADDINI**, Agronomist, Rome, Italy

**Dan-Lucian DASCALU** — zootechnician - SCDCB Dancu, Romania

### **Bibliographic references:**

- An. (2013) Vitele din rasa Sura de Stepa, pe cale de disparitie. <http://observator.tv/> 11.07.2013.
- BEJENARU Luminița (2003) Date Arheozoologice Privind Tipologia Bovinelor Crescute în Așezările Medievale de pe Teritoriul României. *Arheologia Moldovei*, XXVI: 325-330.
- BĂCILĂ Vasile, VIDU Livia (2011) Sura de Stepa. In: Bodó Imre (a cura di) Podolic Cattle-Characterisation of Indigenous and Improved Breeds. *Te-Art-Rum Bt., Budapest, Hungary*.
- BONADONNA Telesforo (1950) Zootecnica speciale. Vol. 2: Bovini, equini. *Istituto Editoriale Cisalpino, Milano, Varese, Italy*.
- CALOTESCU Tudor (2017) Sura de stepă încă mai respiră... promisiuni. *Revista Ferma*, 28 octombrie 2017.
- CANTEMIR Dimitrie (1714) Descriptio Antiqui et Hodierni Status Moldaviae - Caput VII - De Animalibus Feris et Domesticis. *Bibliotheca Academiae Mosquitanae, Moscow, Russia*.
- CHELMU S.S., MACIUC Vasile, CREANGĂ Șteofil (2013) Reproduction indexes of Grey Steppe cattle breed from Romania been in genetic bio preservation. *Romanian Biotechnological Letters*, 18 (5): 87158722.
- CONDREA-ZĂPODEANU Tina (2017) Idei de afaceri: vaci rasa Sura de stepă. *Ziarul Ceahlăul, Piatra Neamț, Romania*. 28/09/2017.
- CREANGĂ Șteofil, MACIUC Vasile, GÎLCĂ Ioan (2010a) Research Regarding Genetic Polymorphism on the Main Lactoproteins at Sură de Stepă Breeds. *Scientific Papers: Animal Science and Biotechnologies*, 2010, 43 (2): 221-225.
- CREANGĂ Șteofil, MACIUC Vasile, GÎLCĂ Ioan (2010b) Contributions to the Study of Sura de Stepa Cattle Breeds. *Scientific Papers: Animal Science and Biotechnologies*, 2010, 43 (2): 252-257.
- CREANGĂ Șteofil, DASCĂLU Dan-Lucianu, RUGINOSU Elena, BORȘ I., ILIE Daniela Elena, CEAN Ada (2013) Demographic Study on the Total Sura de Stepă Breed Population in Romania. *Cercetări Agronomice în Moldova* Vol. XLVI , No. 2 (154).
- DASCĂLU Dan-Lucian (2014) Conservarea Rasei Sură de Stepă din România. *Universitatea de*

*Științe Agricole și Medicină Veterinară "Ion Ionescu de La Brad" Iași, Romania.*

FILIP Nicolae (1900) Les animaux domestiques de la Roumanie : chevaux, boeufs, moutons et porcs. *I. V. Socecu, Bucarest, Romania.*

FRENCH M. H. (1969) Les bovins d'Europe. Volume II. *FAO, Rome, 271-277.*

GEORGESCU Sergiu Emil, MANEA Maria Adina, ZAULET Mihaela, COSTACHE Marieta (2009) Genetic diversity among Romanian cattle breeds with a special focus on the Romanian Grey Steppe Breed. *Romanian Biotechnological Letters*, Vol. 14, No. 1, 4194-4200.

GEORGESCU Sergiu Emil, COSTACHE Marieta (2012) Genetic Characterization of Romanian Local Breeds Using Microsatellite Markers. In Caliskan Mahmut (editor) *Analysis of Genetic Variation in Animals*, 27-44.

HÖNSCH Pal (1971) Il problema della somiglianza, ovvero della identità tra la razza bovina Maremmana e la Grigia ungherese. *Zootecnica e veterinaria*, 11-12: 204-223.

ILIE Daniela Elena, CEAN Ada, CZISZTER Ludovic Toma, GAVOJDIAN Dinu, IVAN Alexandra, KUSZA Szilvia (2015) Microsatellite and Mitochondrial DNA Study of Native Eastern European Cattle Populations: The Case of the Romanian Grey. *PLOS One*, 10(9):e0138736.doi:10.1371/journal.pone.0138736.

LANCIONI Hovirag, DI LORENZO Piera, CECCOBELLI Simone, COLLI Licia, CARDINALI Irene, KARSLI Taki, CAPODIFERRO Marco Rosario, FERRETTI Luca, AJMONE-MARSAN Paolo, SARTI Francesca Maria, LASAGNA Emiliano, ACHILLI Alessandro (2017) Ancient distinctive migration routes suggested by the current mitochondrial gene pool of Podolic cattle breeds in Italy. *Italian Journal of Animal Science*; volume 16: supplement 1. (*abstract*)

MACIUC Vasile, CREANGĂ Șteofil (2010) Rasa Sură de Stepă din România. *Editura Alfa, Iași, Romania.*

MASCHERONI Ettore (1929) I bovini. *UTET, Torino, Italy.*

MASON Ian Lauder (1951) World Dictionary of Livestock Breeds, Types and Varieties. *Commonwealth Agricultural Bureaux, Slough, Bucks, England.*

PACHIȚANU Vasile (2006) Patrimoniul genetic - Sura de stepă. *Revista Ferma, Dumbrăvița, Romania*, 24/01/2006.

USUELLI Filippo (1934) Delle razze bovine autoctone e dell'acclimatazione delle razze straniere in Rumania. *La Clinica Veterinaria*, 607-633.

VIDU Livia, BĂCILĂ Vasile, CĂLIN Ion, UDROIU Alina, VLADU Marius (2013) The Importance of Ancestral Grey Steppe Breed in Romania for Ensuring Biodiversity Cattle in South East Europe. *Analele Universității din Craiova, seria Agricultură – Montanologie – Cadastru*. Vol. XLIII 2013

**Images in the published version of the article** (*all images by Dan-Lucian DASCALU*)

**72** Dancu, cows and calves

**74** (*left*) Pardina – bull (*right*), cow and calf

**78** The location of municipalities of Dancu and Pardina in Romania.