

NATIVE CATTLE BREEDS

Three cattle breeds are recognized as a national genetic heritage and are accordingly included in breeding programmes and other programmes through which the Republic of Croatia promotes their preservation. Programmes for the conservation of the Istrian and the Slavonian-Syrmian podolian cattle were launched in the 1990s, while the Busha breed was included in the conservation programme in 2003. Measures taken have stopped the negative population trends and stabilized the population structure. Most of the phenotypic and production characteristics have been established and the genetic structure is currently being determined

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
				6	54	130	129	180	253	318	425	530	747	886	1033	1259	1547	1920
210	280	314	393	448	351	463	458	668	768	819	1005	1005	1147	1163	1224	1293	1336	1386
46	48	57	63	92	82	123	132	158	162	204	229	248	261	297	299	313	317	340

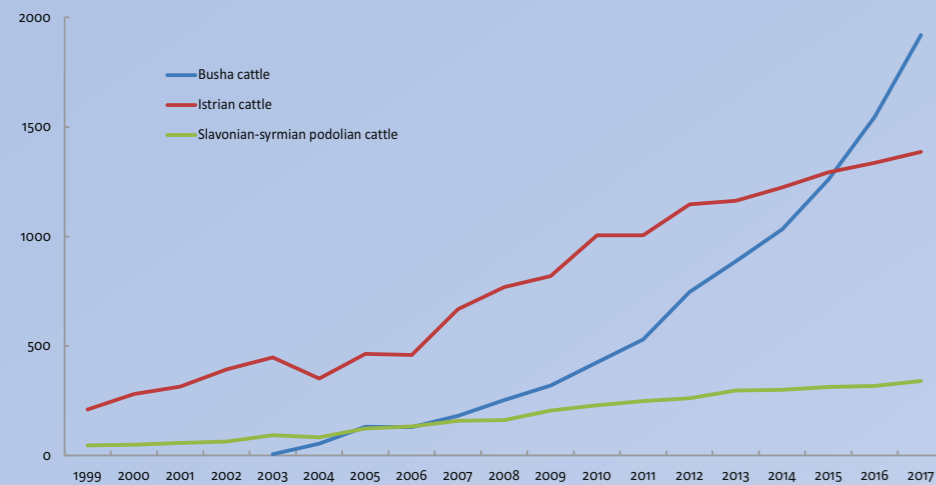


Figure 1 Trends in three populations of Croatian native cattle breeds (cows and female offspring)

Genealogical structure of the breeding of native cattle breeds

A reliable herd book allows planned management of breeding (planned mating) with the goal to preserve and increase genetic diversity and avoid harmful effects of breeding among related individuals (inbreeding) since the populations are small and bred in closed breeding (purebred).

The CAA conducted the systematization of breeding for all three native cattle breeds. The breeding of each breed is structured through bull lines as a sequence of genetically related male animals and cow lines as a sequence of genetically related female animals.

The result of the systematization is the following genealogical structure:

- Slavonian-Syrmian podolian: 7 bull lines and 13 cow lines,
- Istrian cattle: 6 bull lines and 144 cow lines,
- Busha cattle: 24 bull lines and 154 cow lines.

Genealogical structuring is a significant contribution to further conservation and genetic improvement of native cattle breeds. It allows planned management of breeding in order to preserve genetic diversity within the breed, while at the same time enabling targeted sampling in order to accurately determine the genetic diversity within the breed using molecular genetics methods.



IMPLEMENTATION OF BREEDING PROGRAMMES

PROTECTION OF NATIVE BREEDS



The Croatian Agricultural Agency (CAA) is an institution established in 1994 by the Government of the Republic of Croatia in order to improve livestock production and breeding in Croatia. Since its founding, its main activities are related to services in the livestock sector: participation in the implementation of breeding programmes for all livestock species and breeds, management of the Unique registry of domestic animals, laboratory analysis of the quality of milk, livestock feed and honey, organization of a quality assessment system in abattoirs, promotion of livestock products produced on Croatian farms, etc.

The Croatian Agricultural Agency participates in the implementation of breeding programmes in close cooperation with breeders' associations, where the main part of the activities is related to the production traits recording of all species and breeds of livestock, testing the livestock using different breeding tests, analysis of the data collected through the implementation of breeding programmes and estimation of breeding values for all herd book animals.

The CAA participates in the design and implementation of breeding programmes for all Croatian native livestock breeds, which form an integral part of programmes for their protection and conservation. Furthermore, the CAA has, with the authorization of the Ministry of Agriculture, established a Gene bank for domestic animals of the Republic of Croatia. The Gene bank stores and protects biological (genetic) material from 27 native and protected breeds of domestic animals (nine sheep, four horse, three donkey, cattle and goat, two pig and poultry and one honeybee breed).

The Gene bank for domestic animals of the Republic of Croatia has been established under the National programme for conservation of native and protected breeds in the Republic of Croatia. The institutional framework of the Gene bank includes bodies from public administration, public institutions (Ministry of Agriculture, CAA), scientific and educational institutions, cooperating institutions with relevant expertise in agriculture and veterinary medicine, breeders' organizations, nongovernmental associations and companies from the field (Centres for artificial insemination).

The Gene bank consists of genetic material (embryos, ova, semen, and somatic cells) which is properly collected, processed and stored, and traceable documentation and information system which monitors storage of genetic material in the Gene bank collection. The Gene bank stores genetic material from breeds of local, regional and global significance, in accordance with the selection and conservation strategy.

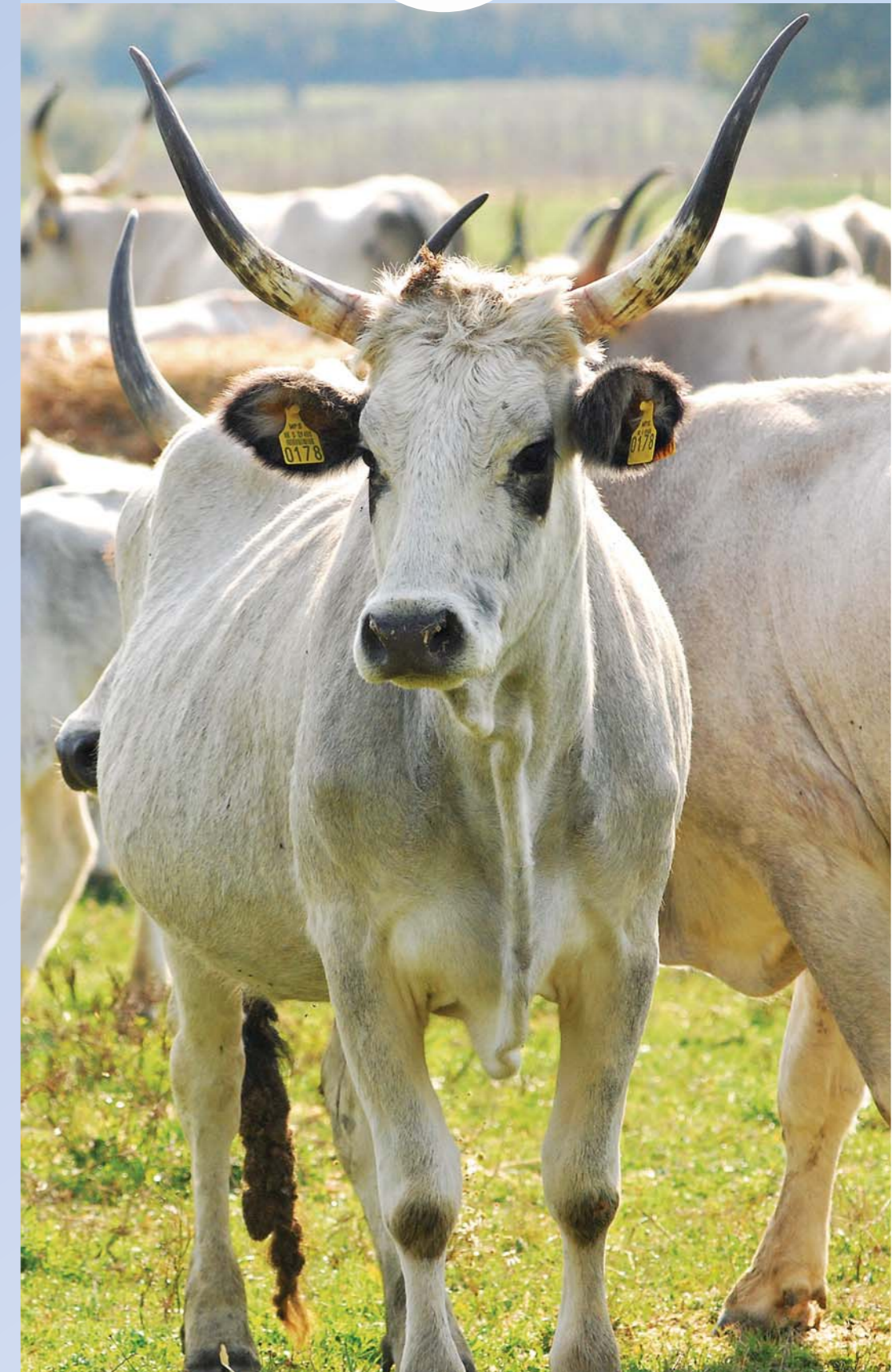
The genetic material stored in the Gene bank is public property. The Ministry of Agriculture has named the CAA the institution responsible for the establishment and further development of the Gene bank. Therefore, it is responsible for managing the Gene Bank Collection, as well as for the coordination of all activities related to the conservation and utilization of the genetic resources stored in the Bank.

CROATIAN AGRICULTURAL AGENCY
Poljana Križevačka 185, 48260 Križevci
Tel: +385 48/279-072; Fax: +385 48/693-216

hpa@hpa.hr
Ilica 101, 10000 Zagreb

www.hpa.hr

27 – 31
August
2018



PROTECTION OF NATIVE LIVESTOCK BREEDS

SLAVONIAN-SYRMIAN PODOLIAN CATTLE



Origin: Slavonian-Syrmian podolian cattle settled on Croatian plains two thousand years ago, while the Roman legions advanced towards the plains of the Danube delta. In the second wave the podolian cattle reached the Croatian plains together with the arrival of Avar tribes from the East. Cattle production in the area of Baranya, Syrmia, Slavonia and Podravina, was based on this breed until the 20th century.

Phenotypic and production characteristics: Slavonian-Syrmian podolian cattle is a late maturing breed of moderate frame size (height at withers ranges from 125 to 140 cm). The animals are grey-white to dark grey, while the neck dewlap and the head often have darker pigmentation. In bulls, there is noticeable pigmentation and larger dark circles around the eyes. The muzzle, eye mucosa and hooves are of a darker pigmentation (black). The udder is small. The horns are exceptionally long, often slanted with tips that stick out on the sides and with a large range of the tips (lyre-shaped). There is also another type of horns that are placed more vertically, and the tips are curved backwards forming the shape of a pitchfork. The average milk production is around 800 to 1000 litres per lactation. Slavonian-Syrmian podolian cattle are kept in pasture for the most of the year.

Breeding area: The Slavonian-Syrmian podolian cattle population is bred in the area of Prigorje, Posavina, and Slavonia. The Lonjsko Polje Nature Park and The Gajna protected landscape keep podolian herds included in the implementation of the breeding programme.

Population size: In the late 1980s, the Slavonian-Syrmian podolian was on the verge of extinction, and the implementation of a programme for systematic protection started in 1997. Today, only 33 breeders breed a total breeding population which in 2017 consisted of 11 bulls and 201 cows. The effective population size (Ne) is 41.72 which categorizes this breed as critically endangered (Ia). Since it is suitable for less intensive farming systems, programmes for their economic utilization are also being designed.

Since 2008, breeders of this breed are united within the Slavonian-Syrmian podolian cattle breeders association ("Udruga uzgajivača slavonsko-srijemskog podolca" - UUSSP) based in Slavonski Brod. The association has the status of recognized breeders' organization and it implements a breeding programme for Slavonian-Syrmian podolian cattle in cooperation with the CAA.

ISTRIAN CATTLE



Origin of the breed: There are more theories about the arrival of ancestors of today's Istrian cattle. However, the breed has lived in the area of Istria and the Kvarner islands since ancient times, as verified by numerous archaeological evidences. In the late eighteenth century, a targeted introduction of Italian bulls from Romagna and Puglia and later from Marche and Polesina was conducted with the goal to improve production traits.

Phenotypic and production characteristics: The Istrian cattle breed is a late maturing (reaches maturity at the age of 6 to 7 years), long-lived with a moderate frame size (height at withers ranges from 135 to 150 cm, bulls even 170 cm). Milk production is low, 800 to 1500 litres per lactation. The animals are usually monochromatic: light gray to white with transitions to darker shades of gray. Bulls are generally darker than cows and heifers. One of the characteristics (more frequently in bulls) is a darker pigmentation on the neck, shoulders, lower parts of the ribs and abdomen, along the nasal ridge, phalanges, part of the face, around the eyes, on the edges and inside the ear and on the lower inner part of the tail. The eyelid mucosa and eyelashes are dark grey to black. The tongue is lead gray, while the palate is almost black. The horns are long and lyre-shaped, with a range of 70 cm or more. The roots of the horns are greyish to yellowish and the upper half of the horns is dark gray to black. The calves are mostly red upon birth, but they can also be white to gray.

Breeding area: The Istrian cattle population is bred in Istria and to a lesser extent in the Primorje-Gorski Kotar County.

Population size: In the late 1980s, an initiative was launched to protect Istrian cattle. The implementation of a registration and monitoring programme started in 1994. In 2017, the breeding population consisted of 49 bulls and 860 cows, which are bred by 152 breeders. The effective population size (Ne) is 185.43 which categorizes this breed as highly endangered (I).

Since 1990, the Istrian cattle breeders' association ("Savez uzgajivača istarskog goveda" - SUIG) based in Višnjan acts as the recognized breeding organization for Istrian cattle

BUSHA CATTLE



Origin: The monophyletic theory assumes that the formation of Busha cattle started 6500 years ago, when domesticated cattle from the Middle East were introduced to the existing local wild cattle populations in south-eastern Europe (secondary domestication).

Physical and production characteristics: The Busha cattle breed has a smaller body frame (height at withers ranges from 100 to 115 cm). The cows can weigh up to 250 kg, and bulls up to around 300 kg. This is a late maturing breed; heifers become mature at the age of 2. The calves are very small; their weight at birth is about 15 kg. Female animals breed for 10 to 12 years, and live up to 20 years. The animals of this breed are always monochromatic: light, brown, red or black, with a stripe on the back in contrast with the base colour. Striped Busha cattle are less frequent (narrow stripes along the body). The Busha cattle have a typical muzzle (dark pigmented mucous membrane with a white edge). The horns and hooves are always dark. The short horns often have light coatings around the root, while the tips are regularly black. The bones of the head are gentle, the forehead is broad, and the horns are short and horizontally oriented at the base. The neck is dry, with taut skin and unexpressed dewlap. The back is narrow, short and straight and the croup is roof shaped and downcast. Milk production per lactation is around 750 litres with the fat content from 4 to 6%.

Breeding area: With the introduction of productive, conventional breeds, the Busha population diminished. The remaining animals were saved in Lika and Dalmatia, but nowadays Busha is reared in the most parts of Croatia.

Population size: The programme for the protection of Busha cattle was initiated in 2003, and from 2007 Busha cattle is reared under the national breeding programme. In 2017, the breeding population consisted of 84 bulls and 1060 cows bred by 118 breeders (CAA, 2017). The effective population size (Ne) is 311.33 which categorize this breed as potentially endangered (II).

Busha cattle breeders association (Udruga uzgajivača buše – UBB), was established in 2008 as a recognized organization of Busha cattle breeders.