

PROTECTION OF TRANSBOUNDARY CATTLE BREED BUSHA IN THE R. OF MACEDONIA

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Abstract

The Program of conservation (biodiversity) of livestock breeds has started in the Republic of Macedonia since 2011 year. According to the Law of livestock production from 2008, in cattle there is only one domestic shorthorn breed called Busha. The Macedonian Busha was identified on five locations in the central and the southeastern part of Macedonia in three strains: black (Polog), grey (Povardarian) and brown strain, and the very rare red and tiger strain of busha cattle. The main morphological, productive and reproductive traits of busha have been investigated, and the procedure of collecting genetic material of the macedonian busha for DNA analyses has started.

Key words: biodiversity, conservation, cattle, busha.

Introduction

In Republic of Macedonia according to the Law of Animal Production from 2008, there are several autochthonous breeds of domestic animals: in cattle it is the breed Busha, in pigs shishka breed, in goats Balkan pied breed, in sheep there are 3 strains of pramenka, in poultry it is the Domestic breed of chicken, and in bees it is *Meliphera Macedonica*. In November 2010 the Ministry of agriculture edited a Program for biodiversity of domestic animals.

Busha cattle is a transboundary breed of the Balkan Peninsula where it has been bred for centuries. It belongs to a group of primitive shorthorn cattle (*Bos brachyceros europaeus*), which used to be dominant breed in Macedonia, as well as in Slovenia, Croatia, Bosnia and Hercegovina, Montenegro, Serbia, Albania, Bulgaria, Greece and Turkey until the beginning of XX century. Today in lowland regions with intensive agricultural farming it is already replaced with more productive and specialized cattle breeds.

In Republic of Macedonia Busha breed at the beginning was classified as triple purpose breed (for meat, milk and work) but considering it's low body mass, now is generally dual-purpose breed, for milk and meat production.

Because of absence of systematic cattle improvement program these animals have retained their poor milk and meat production capability.

Busha breed is well adapted to the very harsh feeding and housing conditions that exist in the rural areas of Macedonian mountains and which is resistant to diseases, it is still the most significant milk and meat resource for those areas where the more productive cattle breeds can not produce successfully. In the past several decades, as a result of uncontrolled

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crossing of this cattle with some more productive breeds, the number of purebred Busha animals has permanently being reduced which imposes an urgent need for setting up *in situ* and *ex situ* conservation program.

Cattle farming in Republic of Macedonia consists of three sectors: small-scale farmers (around 90%) keeping 1-3 cow and mainly producing for home consumption with low production; medium-scale farmers (5%) keeping 10-15 cows with annual production of 4000-5000 kg milk/head, and specialized commercial farms (around 5%) with more than 50 heads that produce annually over 7.000 kg milk intended solely for the market (Trajkovski and Bunevski, 2006).

Material and method of working

As a material for working 650 adult cattle Busha were taken in 5 herds, located in 5 different regions in South and Southeastern part of the R. of Macedonia. They belong mainly to three different strains of Busha: grey (Povardarian), brown and black strain. All of them are rearing free on pastures, with free natural mating with 1-2 bulls per herd. During the winter months cattle are housed in small barns, and during the summer months they are located at the mountain pastures. Some cows are milked manually by the breeders, which amount was measured in kilos. Some exterior traits were taken by the standard measuring practices, in cm.

Results and discussion

Morphological characteristics of the cattle breed Busha

Busha adult cattle have a small size and body mass. Carried by a short neck their head is small and light with short horns pointing upward and forward. The fully grown Busha animal is 90-115 cm tall at the withers. There are large variations in the length of the body which is a result of the extensive way of rearing, lack of any breeding program and the poor zootechnical measures. Some of these animals have 1-3% higher pins than withers and some are with horizontal back line. They have narrow chest whose width is approximately 27% and depth 50-55% of the withers height. The fore limbs are straight but the hind limbs are usually hocked in. The rear part is narrow and the legs are sturdy with strong joints and ligaments. The hooves are hard and strong which enables these animals to move easily on steep and rocky terrains. The udder is small and shallow but with regular shape. Those animals that are better fed usually have bigger and deeper udders with more glandular tissue.

The small body weight of these animals is not completely genetically dependent but also is a result of generations of underfeeding and neglecting. The coat of this breed is one-colored and on basis of the color there are several strains: grey, black, brown, red and so called "tiger" which is much rarer. The skin is elastic and hard. Those animals that are reared well have short and shiny coat hair while in those that are neglected the coat is long and dense. Those that are raised on high mountain pastures always have longer hair. They usually have a stripe over the back and the muzzle, the horns and the hooves are darkly pigmented.

The head is characterized with short and curved horns pointing upward and forward and light pigmentation around the eyes and the muzzle. It is very robust and resistant with very modest feeding and housing demands. They are well adapted to the very harsh feeding and housing conditions, resistant to diseases and have long production life - 10 and more

lactations. It could be said that the Busha's genome is very elastic, since this breed in more favorable conditions easily achieves bigger body weight and much better production.

Exterior and linear characteristics

Being reared extensively in rural areas with underdeveloped agricultural practices this breed of cattle represents typical reflection of those poor raising conditions. During the spring and summer months when the vegetation is most abundant, these animals usually gain most of their weight which in turn is drastically reduced in the winter period. The winter feeding is insufficient and consists of hay, corn straw and small quantities of grain concentrate.

The small, low and dark barns or cottages with poor hygiene are the housing facilities during the winter months and only make worse the negative impact of the unbalanced and obscure nutrition. The starvation of the new born calves begins early in their life since the milk is consumed by the owners. Because there isn't adequate milk replacement fed to the young calves, since the beginning of their life they grow slowly and are underdeveloped, a drawback which cannot be latter compensated for and which in turn results in raising animals with low production capabilities. The zootechnical practices at this raising facilities are at very low level and most of these breeders lack any scheduled and systematic measures for production improvement. It has been shown that those households that implement some kind of zootechnical measures usually achieve better production results with this breed.

Tab. 1 Some morphological traits in different strains of Busha cattle in Strumica and Mariovo region

Trait	Grew strain	Brown strain	Black strain
No. of cows	11	15	4
Wither height	107 (104-111)	105 (99-113)	105 (103-108)
Back height	107 (103-111)	105(101-114)	105 (103-109)
Rump height	109 (103-114)	108 (102-117)	107 (104-115)
Length of head	38 (33-42)	37 (31-40)	37 (35-41)
Length of horns	16 (14-21)	16 (12-19)	15 (14-18)
Born weight	15 (12-18)	14 (11-17)	15 (12-17)

Productive and reproductive characteristics

Milk production. In general Busha cattle has low production which is in accordance with the poor body conformation. On the basis of the production capabilities this breed can be classified as dual purpose breed (for milk and meat). The low milk production is a result of the poor nutrition and the underdeveloped udders. The milk production of this breed is around 700-1500 kg with 3,7-4,0% milk fat but there are also animals with higher milk

production with around 2400 kg or with 4,8% milk fat. The lactation period lasts around 240 days. This low production can not compete with the specialized dairy breeds and the European countries with highly developed cattle breeding practices abandoned or rearing this breed long time ago.

Tab. 2 Milk components of Busha cows milk

Busha strains cows	Milk fats, %	Milk proteins, %	Dry unfatted matters, %	Specific weight
Grey strain	3.89 (3.65-4.45)	3.57	9.49	1.0327
Brown strain	4.04 (3.79-4.61)	3.62	9.62	1.0328

Beef production. Because of the small body weight it is a poor working animal and because of it's poor body conformation and underdeveloped meat portions it is a weak fattening animal. The fattening capabilities of Busha cattle are relatively poor. The birth weight of the calves is 15 - 22 kg. The meat is also of poor quality. The fattening capabilities are low because of the undernutrition and delayed maturity. The meat is of low quality. The health and the conformation of these animals is generally satisfactory having in mind that in such a bad conditions no other specialized cattle breed can survive.

This breed is classified as late-maturity breed because it reaches puberty after 12 months of age and full growth at 4-5 years of age. The first service of the heifers is usually at 20-28 months of age.

Under good raising and feeding conditions the fertility of this breed is generally good but in poor conditions when underfed they easily develop anovulation due to hunger. The bulls reach breeding maturity at 2,5 to 3 years of age while the cows after calving usually have short period of days open from 4 to 6 weeks and can give birth 10-13 times in their life. These cattle show high disease resistance and adaptation to deficient nutritional and other environmental conditions.

Tab. 3 Some reproductive traits in Busha cattle in Mariovo and Strumica region

Trait	Male	Female
Age at first calving	/	28 months (19-39)
Weight at first mating	125 kg (95-155)	150 kg (125-200)
Age at first mating	After 12 months	After 24 months
Fertility (%)	/	55%
Birth weight (kg)	17	13,5
Body weight (kg)	275 (245-390)	230 (180-360)
Age at 12 months of age	125 kg (95-155)	115 kg (90-132)

Future measures for conservation

Busha cattle can be found in mountainous rural areas where it is bred extensively on natural pastures with little man care. Today animals of purebred Busha are less comparing with the other breeds of cattle like simmental, brown, grey tyrol and holstein-friesian cattle.

Although in Macedonia the status of Busha breed is defined as stable/undetermined (Action plan for conserving the animal biodiversity 2011-2017) our opinion is that the actual number of the autohtonous purebred Busha animals is very low. According to the official data of the State Institute for Statistics, animals in Busha type are dominant in the Macedonian cattle population but this number includes all of the genotypes that are morphologically similar to Busha including its crosses with other breeds. In order to conserve this valuable genetic resource this Action plan defines the measures for *in situ* and *ex situ* conservation of this breed as well as creation of a Gen bank as a system for monitoring and sustainable utilization of our autochthonous breeds.

For DNA analyses from a purebred Busha cattle a blood samples and hair samples from the tail were taken and storing, for the further genetic analyses.

Breeding program. Also, a separated Breeding program for Busha cattle has been prepared, where all the necessary aspects ought to be taken, like: population size, breeding goals, selection program, animal identification, book recording, measuring of productive traits for beef and milk production, measuring of the reproductive traits, calculating the genetic parameters, measuring the reproductive traits separate for male and female adult cattle, information system, prevention of inbreeding, traditional rearing technology, biodiversity aspect and other aspects necessary for one breeding program for one breed of cattle on the national level.

Regional cooperation for Bucha improvement

From 2010 some activities were taken between the most competitive people from the Balkan countries, for the simple aim - to improve the domestic cattle Busha. The basic aspects of that regional working are

- Establish regional cooperation
- Knowledge of current status of breed in each region
- Exchange expirience of NC and breeders
- Higher recognizability of the breeds
- For the transboundary breeds to establish common flock book, herd book and other booking documents,
- Development of regional network in Agricultural law, etc.

The main aspect was put not on all transboundary breeds, but only on endangerment breeds.

Conclusions

After a long period of unplanned selection and national strategy for conservation and improving the transboundary breed of cattle Busha, the biodiversity program for Busha cattle in the R. of Macedonia was started since 2011. The main objective is to register, book record and maintain the population size of Busha, as well as to start the breeding program and

enlarge the population size taking into account the planned selection and mating of the superior bulls and cows.

Literature

- Bunevski Gj. (2011) – Breeding program for the transboundary breed Busha in the R. of Macedonia, 1-69, Skopje.
- Trajkovski T., Bunevski Gj., (2006). Cattle Production (book), 1-351, Skopje.
- Law of Animal Production, (2008), Ministry of Agriculture, Forestry and Water Utilization, Skopje.
- Program for Biodiversity of Domestic Animals, (2010), Ministry of Agriculture, Forestry and Water Utilization, Skopje.

ZAŠTITA AUTOHTONE RASE GOVEDA BUŠA U R. MAKEDONIJI

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Rezime

Od 2011 godine u R. Makedoniji započet je program zaštite biološke raznovrsnosti u stočarstvu. Saglasno Zakonu o stočarstvu od 2008 godine, od goveda, jedina autohtona rasa je domaće kratkorogo goveče Buša. Na pet lokacije u centralnom i jugoistočnom delu Makedonije je identifikovana makedonska buša u tri soja: crni (pološki soj), sivi (povardarski soj) i smeđi, a veoma retko se može naći crveni i tigrasti soj buše. Ispitane su glavne morfološke, produktivne i reproduktivne osobine buše, a takođe je u postupku skupljanje genetskog materijala od makedonske buše za DNK analize.

Ključne reči: biološka raznovrsnost, konzervacija, goveda, buša.

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