

CHARACTERISTICS AND PRESENT SITUATION OF ANIMAL GENETIC RESOURCES IN CROATIA

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Abstract

The abundance and variety of local breeds of the Republic of Croatia have been the consequence of the breeding tradition, as well as the diversity of climate in which natural and genetic resources have been tried to be used optimally. In the Republic of Croatia 25 local breeds of domestic animals have been observed, out of which there are five breeds of horses, three of donkeys, four of cattle, six of sheep, three of goats, two of pigs and two breeds of poultry. Intensifying animal production in last and this century, less productive, autochthonous breeds have been replaced with more productive foreign breeds. Also, war, political and economic relations in the last decade have influenced the significant fall in the total livestock numbers in the Republic of Croatia. Efforts to preserve endangered breeds have been made for fifteen years and the first positive results have already been noticed. Constant financial support of the respective Ministry, the application of the latest scientific achievements and experiences of the neighbouring countries connected to the mentioned problems have also contributed to this.

Introduction

Having inhabited areas from fertile lowland field in the north to the Karst regions of Dalmatia and islands in the south, the populations of domestic animals have adapted to the environment, taking special breed characteristics,

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thus helping the inhabitants in the fight against brutal conditions of the environment. Choosing those kinds and types of animals, most suitable for the climate, breeders have been trying for centuries to create optimum breeds. Thus, in lowland conditions of the north, we can find horses and cattle of the strong constitution which helped man in farming the land. Sheep, donkeys and cattle of smaller constitution are characteristic for mountain regions of Lika, Gorski kotar and Dalmatinska Zagora, while on the coast and islands, small cattle of significant modesty and resistance are raised. Such movements resulted in the considerable decrease of the size of some autochthonous populations and in some cases in their disappearance. In the middle of this century, leading scientists (Adametz, 1898; Ogrizek, 1930; Rako, 1947; Rako et al., 1957; Rako 1958) already indicated the value of autochthonous breeds warning about incalculable damage in case of their possible loss. Arousing conscience and cognition in the last decades, the general public has been informed about the problem of preserving autochthonous breeds. The application of the latest scientific achievements, as well as the significant support of respective state institutions raise hopes about the final result of the preservation of genetic resources in the Republic of Croatia.

Actual state of animal genetic resources in Croatia

Horse

The name of the breed: POSAVSKI KONJ (Posavina Horse)

Main characteristics: The breed is very well adapted to harsh conditions, especially flooded areas, and is resistant to diseases.

Description:

- Adult live weight males / females (average, kg): 600 / 500
- Adult wither height males / females (average, cm): 150 / 143
- Colour: Bay, dark bay, grey or sometimes black.
- Specific visible traits: Ears are elliptic and wide apart. The head is noble in profile. Shoulders are medium long, hooves are flat, broad and concave. The body is compact and firm (Romić, 1965).

Utilization: Work - draught horse.

Present situation: Endangered maintained

The name of the breed: MEĐIMURSKI KONJ (Murinsulaner Horse)

Main characteristics: The breed is very well adapted to the local environment.

Description:

- Adult live weight males / females (average, kg): 800 / 650
- Adult wither height males / females (average, cm): 165 / 158
- Colour: Unicoloured: brown, black or grey.
- Specific visible traits: Strong, well-proportioned body, stocky, compact, deep girth and broad chest (Kursar et al., 1994).

Utilization: Work - draught horse.

Present situation: Critical

The name of the breed: HRVATSKI HLADNOKRVNJAK (Croatian Coldblooded)

Main characteristics: Adaptable and hard working animals.

Description:

- Adult live weight males / females (average, kg): 700 / 625
- Adult wither height males / females (average, cm): 165 / 160
- Colour: Usually chestnut or brown.
- Specific visible traits: The body is compact and firm. Shoulders are medium long, hooves are flat, broad and concave.

Utilization: Work - draught horse.

Present situation: Not endangered

The name of the breed: LIPICANSKI KONJ (Lipica Horse)

Main characteristics: Although this breed is not autochthonous, some lines which appeared in Croatia after a hundred-year selective work and the influence of the environment have adopted some characteristics typical only for them.

Description:

- Adult live weight males / females (average, kg): 600 / 500
- Adult wither height males / females (average, cm): 150 / 143
- Colour: Grey and after the age ten of assumes white colour.
- Specific visible traits: The body is compact and firm. small shovel is long and forearm is short which results in the high action of front legs. Swan neck (Brinzej, 1980).

Utilization: Riding, pulling loads.

Present situation: Not endangered

The name of the breed: KRČKI PONI (Krk Island Pony)

Main characteristics: The breed has adapted to a dry Mediterranean scarce coastal vegetation.

Description:

- Adult wither height (average, cm): 114 - 130
- Colour: The body colour is dark brown and the mouth, mane and tail are black.
- Specific visible traits: Wide head, with concave profile line, short ears, excellently situated and muscular neck, short and strong back (Ogrižek, 1914).

Utilization: Work - draught animal also used for riding.

Present situation: Unknown (extinct?)

Donkey

The name of the breed: PRIMORSKO DINARSKI MAGARAC (Littoral Dinaric Donkey)

Main characteristics: By its size, demands and resistance adapted to the conditions of the Croatian Karst coast. Small and horny hoofs are adapted to moving on rocky terrains.

Description:

- Adult live weight (average, kg): 90
- Adult wither height (average, cm): 96,3
- Colour: Grey to dark grey with light to white belly, expressive and clearly discernible cross and stripes.
- Specific visible traits: Small, compact frame, straight profiled head line, short bristly mane (Ivanković et al., 1998).

Utilization: Work - draught animal also used for riding.

Present situation: Not endangered

The name of the breed: SJEVERNO JADRANSKI MAGARAC (Northern Adriatic Donkey)

Main characteristics: The body size is suitable for the climate of Kvarner islands. Resistance, endurance and longevity are typical.

Description:

- Adult live weight (average, kg): 175
- Adult wither height (average, cm): 115,5

- Colour: Varies from brown to black and cross and stripes are not always expressive and clearly discernible.
- Specific visible traits: Medium size frame, a fine head with a straight profiled line, strong and short mane, firm legs and strong tibia (Ivanković et al., 1998).

Utilization: Work - draught animal also used for riding, mule production, as hobby animal and tourist attraction.

Present situation: Endangered (critical)

The name of the breed: ISTARSKI MAGARAC (Istrian Donkey)

Main characteristics: Resistance, endurance and longevity are typical.

Description:

- Adult live weight (average, kg): 220
- Adult wither height (average, cm): 123,5
- Colour: Black, the snout is light to white, the muzzle is dark to black and the cross and stripes are not discernible.
- Specific visible traits: Larger frame, short, black and bristle mane, strong fibia (Ivanković et al., 1998).

Utilization: Work - draught animal also used for riding, mule production, as hobby animal and tourist attraction.

Present situation: Endangered (critical)

Cattle

The name of the breed: LIČKA BUŠA (Lika Busha)

Main characteristics: The breed is very well adapted to the local environment and adapted to extreme conditions. The females are known for easy calving. It is also known for longevity.

Description:

- Adult live weight males / females (average, kg): 400 / 200
- Adult wither height males / females (average, cm): 122 / 112
- Colour: Unicoloured, yellowish-brown, red, brown, dark brown.
- Specific visible traits: Short horns.

Utilization: Food - milk and meat.

Present situation: Endangered (critical)

The name of the breed: SIVO GOVEDO DALMACIJE (Dalmatian Grey Cattle)

Main characteristics: This breed tolerates both high and low temperatures and is adapted to the local environment (karst region). It is also adapted to extreme conditions.

Description:

- Adult live weight males / females (average, kg): 400 / 325
- Adult wither height males / females (average, cm): 125 / 119
- Colour: Unicoloured, grey.
- Specific visible traits: Short and light horns.

Utilization: Food - milk and meat.

Present situation: Not endangered

The name of the breed: ISTARSKO GOVEDO (Istrian Cattle)

Main characteristics: High heat tolerance and adaptation to the local karst region. The breed is known for longevity and modest nutrition (karst pasture land, browsing, straw) (Caput et al., 1990).

Description:

- Adult live weight males / females (average, kg): 900 / 625
- Adult wither height males / females (average, cm): 148 / 138
- Colour: Unicoloured: grey with light snout and rings around the eyes, black tongue, black palate and vulva (scrotum).
- Specific visible traits: Very long (about 1m), lyre-shaped horns.

Utilization: Food - meat and milk, work - draught animal, hobby, tourist attraction.

Present situation: Endangered (maintained)

The name of the breed: SLAVONSKO-SRIJEMSKI PODOLAC (Slavonian Sarmian Podolian Cattle)

Main characteristics: The breed is known for its adaptation to the local extreme climatic conditions. The females are known for easy calving. It is also known for longevity (Brinzej et al., 1974).

Description:

- Adult live weight males / females (average, kg): 600 / 460
- Adult wither height males / females (average, cm): 135 / 128
- Colour: Unicoloured, grey.
- Specific visible traits: Very long, lyre-shaped horns.

Utilization: Food - meat and milk, work - draught animal, tourist attraction.

Present situation: Endangered (critical)

Sheep

The name of the breed: ISTARSKA OVCA (Istrian Milk Sheep)

Main characteristics: The breed is known for tolerance of high heat and shortage of water. Istrian Milk sheep have coarse wool.

Description:

- Adult live weight males / females (average, kg): 90 / 65
- Adult wither height males / females (average, cm): 85 / 78
- Colour: Unicoloured - predominantly white, also black or brown.
- Specific visible traits: Convex profile of the head, rather a long tail, usually without horns. Ears are of medium length, half-protruding to the side. It is a long-tailed breed. Open fleece with tussocks.

Utilization: Food - milk and meat, fibre - wool.

Present situation: Endangered

The name of the breed: PAŠKA OVCA (Pag Island Sheep)

Main characteristics: High heat tolerance and adaptation to the local karst region with poor vegetation and water supply.

Description:

- Adult live weight males / females (average, kg): 52 / 43
- Adult wither height males / females (average, cm): 63 / 56
- Colour: Unicoloured, white.
- Specific visible traits: Females are polled. They have a long tail, frequently to the hock. Half-closed mixed fleece.

Utilization: Food - milk and meat, fibre - wool.

Present situation: Not endangered

The name of the breed: RUDA OVCA (Ruda Sheep)

Main characteristics: The breed is fairly heat tolerant and can withstand lack of water. High-quality fleece, high-quality wool (thin threads, without folds).

Description:

- Adult live weight males / females (average, kg): 48 / 36
- Adult wither height males / females (average, cm): 64 / 60
- Colour: White (90%), black or brown (10%) and approximately 10% of the animals are spotted.

- Specific visible traits: They are usually polled. Sheep has closed to semi-closed fleece with mixed wool and rather a long tail (down to the hock), (Rako, 1949).

Utilization: Food - milk and meat, fibre - wool.

Present situation: Endangered (critical)

The name of the breed: LIČKA PRAMENKA (Lika Sheep)

Main characteristics: The breed is known for its adaptation to the local environment and to extreme conditions.

Description:

- Adult live weight males / females (average, kg): 70 / 50
- Adult wither height males / females (average, cm): 69 / 64
- Colour: Mostly white; black or brown sheep are rare.
- Specific visible traits: Ewes don't have horns while they are well-developed in rams. Open fleece with pointed tussocks (Mioč et al., 1994).

Utilization: Food - milk and meat, fibre - wool.

Present situation: Unknown (endangered)

The name of the breed: CRESKA OVCA (Cres Island Sheep)

Main characteristics: High heat tolerance and adaptation to the local karst.

Description:

- Adult live weight males / females (average, kg): 66 / 62
- Adult wither height males / females (average, cm): 46 / 37
- Colour: Mostly white, black or brown sheep are rare.
- Specific visible traits: The head is covered with thick, white hair. Ears are small, lively and horizontally situated. Ewes don't have horns but they are well-developed in rams (Pavić et al., 1997).

Utilization: Food - milk and meat, fibre - wool.

Present situation: Not endangered

The name of the breed: CIGAJA (Cigaja Sheep)

Main characteristics: Due to better feeding conditions, it developed a larger frame.

Description:

- Adult live weight males / females (average, kg): 84 / 65
- Adult wither height males / females (average, cm): 85 / 78

- Colour: Mostly white, black or brown sheep are rare.
- Specific visible traits: Head, ears and legs have black pigments. Ears are big, lop-sided. Ewes don't have horns, while rams can be with or without horns. Lambs, when born are grey and that colour is lost in four months at the latest. Half-closed fleece, funnel-shaped or cylindrical tussocks.

Utilization: Food - milk and meat, fibre - wool.

Present situation: Endangered

Goat

The name of the breed: HRVATSKA BIJELA KOZA (Croatian White Goat)

Main characteristics: The breed is very well adapted to the local environment and to extreme conditions.

Description:

- Adult live weight males / females (average, kg): 50 / 40
- Adult wither height males / females (average, cm): 63 / 59
- Colour: Unicoloured, white.

Utilization: Food - meat and milk.

Present situation: Endangered

The name of the breed: DINARSKA KOZA (Dinaridian Goat)

Main characteristics: The breed is known for its adaptation to the local environment and to extreme conditions.

Description:

- Adult live weight males / females (average, kg): 40 / 30
- Adult wither height males / females (average, cm): 63 / 59
- Colour: Grey, multicoloured with spots in various colours.

Utilization: Food - meat and milk.

Present situation: Not endangered

The name of the breed: ISTARSKA KOZA (Istrian Goat)

Main characteristics: The breed is very well adapted to the local environment and to extreme conditions.

Description:

- Adult live weight males / females (average, kg): 40 / 30

- Adult wither height males / females (average, cm): 63 / 59

- Colour: Unicoloured, white.

Utilization: Food - meat and milk.

Present situation: Endangered (critical)

Pig

The name of the breed: CRNA SLAVONSKA SVINJA (Black Slavonian Pig)

Main characteristics: The breed is known for its adaptation to the local environment and adapted to extremely extensive conditions.

Description:

- Colour: Pigmented skin of grey-ashen colour, covered with black bristles of medium length.

- Specific visible traits: Long head of concave profile with semi-lop-sided ears. Short and medium muscular trunk (Kralik et al., 1994).

Utilization: Food - meat.

Present situation: Endangered (maintained)

The name of the breed: TUROPOLJSKA SVINJA (Turopolje Pig)

Main characteristics: The breed is well adapted to harsh climate, especially high and low temperatures, and to wet and marshy land. It swims very well.

Description:

- Adult live weight males / females (average, kg): 246 / 240

- Adult wither height males / females (average, cm): 74 / 69

- Colour: Black and white with 5 - 9 black spots the size of a hand.

- Specific visible traits: They are curly haired with semi-lop-sided ears.

Utilization: Food - meat.

Present situation: Endangered (critical)

Poultry

The name of the breed: HRVATICA (Croatian Hen)

Main characteristics: This breed resists cold and adverse weather conditions. It is reported to be resistant to Marek's disease. Number of eggs per year 200 - 240.

Description:

- Adult live weight males / females (average, kg): 3.5 / 2.5

- Plumage pattern: 15% gold-columbian, 35% self-black, 50% self-red and variants.
 - Skin colour: 100 % yellow; Shank and foot colour: 20% white, 80% yellow.
 - Egg shell colour: Brown.
- Utilization:* Food - eggs and meat.
Present situation: Not endangered

The name of the breed: ZAGORSKI PURAN (*Zagorje Turkey*)

Main characteristics: This breed resists cold and adverse weather conditions. The females are known as good brooding hens.

Description:

- Adult live weight males / females (average, kg): 8 / 4
- Plumage pattern: 50% self-black, 40% silver-columbian, 10% wild-type and variants.
- Skin colour: 70% white, 30% yellow.
- Egg shell colour: Creamy white to pale greyish light brown.

Utilization: Food - meat.

Present situation: Endangered (maintained)

Protection and conservation of animal genetic resources in Croatia

During the last 10 years the population size of farm animals of all species has decreased due to war, political and economic changes in Croatia. It has been particularly reflected to local native breeds. Consequently most of them have become endangered. From the point of view of AnGR the breeds in Croatia are divided in two groups: active (mostly imported) and endangered (indigenous breeds). The work to identify indigenous and endangered breeds started some 10 years ago.

After Croatia has signed and ratified the Convention on Biological Diversity the National biodiversity strategy was carried out last year. The action plans of conservation of endangered breeds will be implemented at the end of this year. Funds for conservation programs will be provided by Ministry of Agriculture and Forestry of Croatia.

Three breeds of cattle, two of horses, three of donkey, three of sheep, two of pigs, one of goats and one of poultry are endangered.

Table 1. - POPULATION SIZE OF ALL ENDANGERED BREEDS IN CROATIA (on 31. 12. 1998)

| | Species | Total number of breeding females | Number of males for natural mating | Number of breeding females in HB |
|---------|--------------------------|----------------------------------|------------------------------------|----------------------------------|
| Horses | Posavina horse | 1400 | 57 | 1111 |
| | Murinsulaner horse | 30 | 2 | - |
| | Krk Island pony | 50 | 5 | - |
| Asses | Istrian donkey | 40 | 4 | 20 |
| | Northern-Adriatic donkey | 80 | 8 | 60 |
| Cattle | Istrian cattle | 114 | 24 | 114 |
| | Slavonian-Syrmian | | | |
| | Podolian cattle | 17 | 3 | 17 |
| | Lika Busha | 20 | - | - |
| Sheep | Istrian Milk sheep | 1000 | 30 | 674 |
| | Ruda sheep | 50 | 3 | 22 |
| | Cigaja sheep | 400 | 6 | 316 |
| Goats | Croatian White goat | 1200 | 31 | 1000 |
| | Istrian goat | 50 | 5 | 5 |
| Pigs | Black Slavonian pig | 250 | 9 | 94 |
| | Turopolje pig | 30 | 5 | 13 |
| Poultry | Zagorje Turkey | 500 | 78 | 258 |

The work on the preservation programs for thirteen local and endangered breeds started in the last few years. After the purebred animals had been selected according to phenotype traits, herdbooks were established. The registration and monitoring of the endangered breeds has been carried out by Croatian Center for Animal Breeding and Selection. The Breeding Associations have also taken part in the conservation by keeping animals of endangered breeds. Breeders keeping endangered breeds obtain the subsidy paid by Ministry of Agriculture and Forestry amounting to USD 1 million each year (table 2.).

Parts of this strategy are action plans for conservation (*in situ*, *ex situ*) of endangered breeds. We have set up action plans for *in situ* conservation with estimated costs for every endangered local breed. These action plans should be implemented at the end of this year. If the conservation costs are not covered soon it will be very difficult to carry through all the action plans. Since we are still in the process of transition and have a lot of problems in agricultural production it will be very difficult to find money for conservation of endangered breeds. Ministry of Agriculture and Forestry provided money to subsidize breeders but subsidy is only a part of conservation programs.

Table 2. - FINANCIAL SUPPORT OF LOCAL ENDANGERED BREEDS IN CROATIA

| Species | Subsidy per breeding female | Subsidy per purebred offspring | Subsidy per breeding male |
|--------------------------------------|--------------------------------|-----------------------------------|------------------------------|
| | USD / year | USD/ year | USD / year |
| Istrian cattle | 281 | 702 | 772 |
| Slavonian-Syrmian Podolian cattle | 281 | 702 | 772 |
| Posavina horse | 98 | 210 | 260 |
| Murinsulaner horse | 98 | 210 | 260 |
| Turopolje pig | 35 | 77 | 105 |
| Black Slavonian pig | 35 | 77 | 105 |
| Istrian sheep | 21 | 56 | 49 |
| Ruda sheep | 21 | 56 | 49 |
| Donkeys (three breeds) | 35 | 105 | 84 |
| Zagorje turkey | 15 | - | 19 |

Future plans - We are striving to establish the National Committee on Farm Animal Conservation and find funds for activities of this Committee. Our primary goal in the future will be to find money for a particular action plan for the conservation of endangered breeds.

Summary

According to the presented survey of local breeds, formed in the area of the Republic of Croatia, the following can be concluded:

- numerous local breeds make significant genetic resources in this area
- in the last decade important steps have been taken in informing the general public on the significance of local breeds as a genetic resource and culturological heritage
- by making adequate programmes for preserving endangered breeds and by the application of the latest achievements in their determination, scientific institutions have been actively engaged in their preservation
- respective state institutions have been giving considerable financial and professional support in the realisation of the programme for preserving endangered local breeds.

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ZNAČAJKE I SADAŠNJE STANJE GENETSKIH RESURSA ŽIVOTINJA U HRVATSKOJ

Sažetak

Obilje i različitost lokalnih pasmina u Republici Hrvatskoj posljedica je bogate tisućljetne stočarske tradicije kao i različitosti klimatskih uvjeta pojedinih regija, što je rezultiralo optimalnim iskorištavanjem prirodnih i genetskih resursa podneblja. U Republici Hrvatskoj registrirano je 25 lokalnih pasmina domaćih životinja, a unutar ove skupine nalazimo pet pasmina konja, tri pasmine magaraca, četiri pasmine goveda, šest pasmina ovaca, tri pasmine koza, dvije pasmine svinja i dvije pasmine peradi. Intenzifikacija stočarske proizvodnje koja se odvijala u posljednjem stoljeću, kao i manja produktivnost lokalnih pasmina, uvjetovali su njihovu zamjenu s produktivnijim inozemim pasminama. Domovinski rat, politička i ekonomska gibanja posljednjeg desetljeća dodatno su pridonijeli padu ukupnog stočnog fonda Republike Hrvatske. Napori u zaštiti i očuvanju lokalnih pasmina, započeti prije petnaestak godina daju i prve pozitivne rezultate. Konstantna financijska pomoć nadležnog Ministarstva, aplikacija najnovijih znanstvenih spoznaja, te korištenje iskustava susjednih zemalja u očuvanju ugroženih pasmina odražavaju se u stabiliziranju ugroženih populacija.

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