

AGROTOURISM IN THE FUNCTION OF PRESERVING AUTOCHTHONOUS BREEDS IN CROATIA - AN EXAMPLE OF BUSHA

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Abstract

Croatian Busha is among the world's smallest cattle breeds and belongs to the group of so called short-horns cattle (Bos brachyeros europeus). Croatian Busha is one of the three autochthonous cattle in Croatia. The number of Busha is constantly decreasing, and one of the possibilities for rescuing the breed is the supply of milk, meat and processed products through agrotourism. The aim of this research is to identify the opinions and attitudes of the respondents about the introduction of Busha's meat and dairy products into the offer of agrotourism. For the research purposes, an on-line survey was conducted on 508 randomly selected respondents. The Busha is relatively unknown to the respondents (59.8%), but has great potential for agrotourism. Most of the respondents (70.5%) agree with the idea of branding Busha's products to increase their popularity and create additional value to the farm. Potential consumers support Busha as an autochthonous breed with value-added that endorses tradition and support its appearance in Croatian agrotouristic offer.

Key words: Busha, agrotourism, consumers, tradition, Croatia.

INTRODUCTION

Autochthonous breed, according to the FAO (2012) is a specific group of animals grown in a given country or region long enough to genetically adapt to traditional production systems and the environment. Autochthonous breeds of domestic animals are the valuable heritage of every state or region at the economic, social, scientific and cultural level (FAO, 2007). Autochthonous breeds are an important part of the biodiversity of animal and plant species used in agriculture (FAO, 2016). The permanent, centuries-old loss of genetic resources is a global challenge for the environment, and autochthonous breeds are at risk of extinction around the world (FAO, 2007). Biodiversity and ecosystems are very close concepts because biodiversity depends on the sustainability of the ecosystem (UK National Ecosystem Assessment, UK-NEA, 2016). Agriculture directly affects ecosystems, whereby it is important to meet general production targets, to produce food and fiber

for human consumption that are acceptable in terms of quantity and price. Such a pure economic approach has recently been complemented by other aspects of the sustainability of the ecosystem (ecological, cultural, service, social aspect etc.). So far, little research has been done on autochthonous breeds within the framework of the concept of sustainability of the ecosystem (Hajjar et al., 2008; Tancoigne et al., 2014). However, some aspects of the ecosystems preservation that can provide autochthonous breeds are recognized in previous researches, particularly in the part of food production, genetic resources conservation and maintenance or conservation of habitats or landscapes where they live (Hoffmann et al., 2014; Rodríguez-Ortega et al., 2014). Autochthonous breeds have cultural, social and other value added (Soini et al., 2012a; Narloch et al., 2011; Gandini and Villa, 2003) which should be further explored and when identified should be incorporated or made more visible in policies related to rural areas. The concepts of sustainable ecosystems, as a

focus of current development policies, are discussed as link between the economic and ecological side of agricultural production (Chan et al., 2012). The conducted analyzes confirms this in the frame of Payment for Ecosystem Services (PES) and other valuations of non-market products and services that can be obtained from autochthonous cattle (Zander et al., 2013; Hoffmann, 2011; Narloch et al., 2011). According to some research (Lescourret et al., 2015; Morgan-Davies et al., 2014; Bernués et al., 2011) there is matching between the autochthonous breeds and ecosystems, with regard to sustainability of agro-biological diversity management and related policies. Ovska and Soini (2016) consider that the ecosystem integrates both ecological and cultural aspects of conservation and can be considered a great opportunity for the conservation and sustainable use of genetic resources of animals. Genetic resources of animals, on the one hand, are the result of simultaneous evolution of man and nature, and on the other hand depend on cultural values and practices. According to Sæther and Vangen (2001), Norwegian cattle breeders have different motives for autochthonous cattle breeding. One of the motives is to maintain the diversity of domestic animals in this area due to farmers own enthusiasm, and the other is due to the formal state support of such activities. Norwegian cattle breeders consider that the characteristics of such autochthonous cattle by commercial selection do not provide conservation treatment as well as natural cattle selection. The research found that farms that bred autochthonous cattle can have a positive financial result if all the comparative advantages of such animals are economically evaluated. Livestock breeders in Norway consider that keeping autochthonous cattle can have advantages over conventional farming, as consumers increase awareness about ecology and biodiversity. In Croatia there is a systematic protection of autochthonous cattle (Busha, Istrian cattle, and Slavonian Syrmian Podolian cattle) since the nineties (Busha since the year 2003). Then the registries are established and grants are given to the breeders of autochthonous cattle. Planned and continuous breeding work seeks to minimize

the loss of genetic originality (Ivanković et al., 2006).

Intensive agricultural production today gives preference to the breeds with expressed desirable production characteristics. Such breeds have been shown to be less resistant, more susceptible to disease, and more demanding in keeping condition. Unlike these, autochthonous breeds were created by the centuries-old (almost natural) selection in natural environment. Their diversity represents genetic potential and resources that can always be used to improve the properties of other breed. On the other hand, autochthonous breeds are characterized by the weaker production and economic properties of today's breeds, which is why state aid is needed in their economic sustainability. The importance of this has been recognized in the EU rural development programs, so there is a National Program for the Conservation of Original and Protected Domestic Breeds¹ which compensates the poorer production and economic performance. Croatian Busha is among the world's smallest cattle breeds and belongs to the group of so called short-horns cattle (*Bos brachyeros europaeus*). Croatian Busha is one of the three autochthonous cattle in Croatia, which was the basis for cattle production until the middle of the twentieth century. Because of its modest productivity, in the second half of the twentieth century it was suppressed by intensive production where it was partially replaced by crossing with other breeds more suitable for the more intensive cattle production.

In the early 20th century in the karst areas of the Kingdom of Croatia, Slavonia and Dalmatia the Busha exceeded 92% of the total number of cattle (Frangeš, 1903). It especially dominated the coastal and mountainous regions of Croatia, where its population is the most concentrated even today. According to the data of 1939, the Busha was dominant until the Second World War with as much as 50% in the population of 2 million cattle (Ogrizek, 1941).

Today, this breed is almost extinct because of the weaker production characteristics and production focus on highly profitable breeds that have good economic performance but little

¹Ministry of Agriculture, 2010.

contribution to biodiversity. For this reason, recently there have been trying to find a way to save Busha from extinction and to stop the reduction of the genetic fund and heritage of the Republic of Croatia. Some of the values that will be used to estimate the interest for Busha in the future are the genetic structure and genomic specificity, the production of recognizable foods, ecological production, the preservation of habitats in the original environment and the improvement of the identity of the rural environment (Čačić et al., 2012).

One of the options is commercialization of Busha, ie linking the ecosystem in which it lives with its valorization through agrotourism. To our knowledge, no research has defined the consumer's opinions and attitudes about introducing Busha in agrotourism. The objective of this paper is to identify the consumers' opinions and attitudes about introducing food delicacies of Busha in farm agrotourism offer.

MATERIALS AND METHODS

The survey

For the purpose of this paper, a survey was conducted in the period since 18th May 2016 to 13th June 2016 in which the potential beneficiaries of services and products of agrotouristic farms were involved, which offer meat and milk products. Their attitudes and opinions about cattle as well as justification for the inclusion of its products into tourism offerings on agricultural holdings have been examined. For the collection of primary data in

the survey, a questionnaire was used online and sent to several hundred electronic addresses and distributed via the Facebook and LinkedIn networks. The study involved 508 respondents of different age groups, education level and place of residence. The survey questionnaire consisted of 17 questions, according to the following groups: sociodemographic variables (gender, age, place of residence, education), frequency of visits to agrotouristic farms, familiarity with the term Busha, impact of product offerings on agrotouristic farms to preserve the breed, consumption frequency of Busha products, the necessity of branding the products, and the opinions about development of the tourist offer of the rural area based on autochthonous products and the price justifiability of such intent. Respondents had to express their agreement about statements on a five-point Likert scale that ranged from (1) - completely disagree to (5) - completely agree. Busha belongs to the endangered breeds, and as a criterion it is used „Effective population size” according to Falconer (1989): $N_e = 4 N_m * N_f / N_m + N_f$ here: N_m -number of bulls, N_f -number of cows. If N_e is higher than 50 and lower than 200 it is a highly endangered breed.

Sample characteristics

The survey involved 508 respondents. The sample characteristics are presented in the Table 1. From the total number of respondents, 54.3% are female. Although the sample was heterogeneous according to sociodemographic characteristics, female respondents younger than 35 years, well educated, with residence in urban area predominate in the sample.

Table 1. Description of the sample

Sociodemographic		N=508	%
Gender	Female	276	54.3
	Male	232	45.7
Age	< 25	225	44.3
	26-35	151	29.7
	36-45	63	12.4
	45 >	69	13.6
Education	Elementary school	4	0.8
	High school	217	42.7
	University, Master and/or PhD	287	56.5
Place of living/Residence	City	298	58.7
	Village	210	41.3

Data analyses

The gathered data was coded and entered in the program package SPSS (Statistical Package for

Social Science, version 17.0). Prior to entering the data in the SPSS program, pre-audit and overlay of the response was performed. After

entering the data, the post logical control of the entered data was made. One-way and two-way data processing was used. Respondents' socio demographic features were used for sample segmentation as independent variables.

The differences between segments were examined using comparative analyses (Chi-square test). The level of significance that is applied is $p < 0.05$.

RESULTS AND DISCUSSIONS

Production and breeding characteristics of Busha

Busha has a relatively weak milk production as evidenced by its appearance, and especially the weakly developed udder (Konjačić, 2005). Lactation of Busha according to Adametz (1895) lasts from 5 weeks to 5 months and in that period produces 600-1,400 liters of milk. Rako (1943) speaks about the Neretva Busha and about the satisfactory amount of milk if it takes into account the quality and quantity of food that the animal receives. Through the conducted 4-year test, Busha gives 1,030 to 1,546 liters of milk in lactation, proving that Busha produces 4.85 to 5.34 times more milk than their own mass (Konjačić, 2005). It should also be noted that the amount of milk fat ranges from 4.44 to 5.00%, whereas that value in intensive production (Simmental breed) is 3.98%. Caput (1996) states that Busha can produce from 1,000 to 2,000 liters of milk, and in good feeding conditions up to 3,000 liters with 4-5% fat. Accordingly, the effectiveness of milk production is at an enviable level and may amount to up to 1,000 liters per 100 kg of body weight. From this milk, it is possible to produce a whole range of products such as: cheese, cream, sour milk, basa (traditional fresh soft cheese from Lika), prgica (spiced dried fresh cheese from Međimurje).

It is small cattle, which means that the slaughter body mass is small. According to Ogrizek (1941) the average body mass of adult cows was 150-180 kg, while the better fed cows reached a significantly higher body mass, up to 280 kilograms. Meat of Busha is lighter than the meat of Podolian cattle (Ogrizek, 1941). The color of meat depends on sex, age, nutrition and choice of feed in meal. Dark red

meat occurs in older animals and in male sex, while slightly less red occurs in cows, and light pink color is meat of calves. Slaughter dressing percentage is small, about 45%.

Busha is very resistant cattle (Adametz, 1895; Rako, 1943; Frangeš, 1903; Ogrizek, 1941; Šmacelj and Rako, 1955). Over the years, resistance and health were influenced by natural selection that eliminated animals with weaker exterior, constitutional and vital deficiencies, and diseases such as tuberculosis, gallstones and fever were unknown or very rare in areas where the Busha was breeding. For this reason, there is a possibility that the Busha's genome will be inserted into the noble breeds that are much more sensitive and more unstable in terms of health.



Figure 1. Busha
Source: Project BBio, 2014

Busha belongs to late maturing cattle and reaches its maturity for 2 years while full physical development ends in age of five (Ogrizek, 1941). The cows remain in breeding up to 20 years of age. Over the past period, one of the problems was that the male and female cattle were held together on the pasture, so unplanned calving came in, usually too early and this is one of the reasons why the cattle has been "undeveloped". The fertility of Busha is good without any significant problems in calving and is usually calved without the help of the breeder. Konjačić (2005) states that there are almost no cows that do not calves ones in a year. Adametz (1985) states that the weight of calves ranges from 13 to 22 kilos (16.5 kg on average). Sexual cycles are regular, and the first is reported a month after calving. In the history, Busha besides the other so-called „cargo“ animals, were used to work on the field

or to pull the material from the field or from the forest. Ogrizek (1941) points out that the Busha's bull working strength was very good considering the small age and weight. They had the biggest usage on sloping and steep positions due to their agility and endurance. By modernizing agriculture, the work of domestic animals was replaced by modern mechanization, which also negatively influenced the population of domestic animals and thus Croatian Busha. Nowadays, domestic

animals are used in remote parts of the world with poorly developed agricultural production, while in Croatia they could only be used in old customs and in some folkloric occasions as attractions for farm visitors or events.

Number of Busha in Croatia

The number of Busha cattle in Croatia increases in the period from 2008 to 2015, but it is still small and according to the effective size of the population in the category of endangered breeds, potentially endangered.

Table 2. Changes in the number of heads in the 2008-2015 period in Croatia

Year	Nr. heards	Nr. bulls	Nr. cows	Young female cows		Effective size of population	Total
				<1 y	1 y>		
2008	45	16	172	46	35	58.55	269
2009	48	22	199	75	44	79.24	340
2010	57	25	240	95	89	90.57	449
2011	66	33	308	116	106	113.93	563
2012	70	35	385	146	216	128.33	782
2013	89	46	461	157	268	167.31	932
2014	91	53	538	208	287	192.99	1,086
2015	100	55	703	267	287	204.04	1,312

Source: Annual reports of Croatian Agricultural Agency (CAA, 2009; CAA, 2010; CAA, 2011; CAA, 2012; CAA, 2013; CAA, 2014; CAA, 2015; CAA 2016)

According to the Croatian Agricultural Agency (HPA, Hrvatska poljoprivredna agencija) the largest numbers of Busha cows are registered in Lika-Senj, Split-Dalmatia and Dubrovnik-Neretva counties, while potential breeding grounds exist also in continental counties such as Koprivnica-Križevci and Bjelovar-Bilogora counties where there are several herds.

Croatian areas where Busha is grown are characterized by many features as naturally poor, rough and unsuitable for intensive agricultural production, which is proof of the great adaptability of this breed. Therefore, Busha could be adapted to the much more

favorable conditions that can be provided by continental Croatia, which would allow growers better financial results.

Results of survey

Agrotouristic offer in Croatia is more and more important (Grgić et al., 2011.), as well as the demand for such a type of tourism by consumers (Zrakić et al., 2012). Thus, most of the respondents (57%) visited an agrotouristic farm and most of them were once a year (25.2% of respondents or 44.0% of respondents with a positive answer). There are fewer respondents who did it several times a year (21.3% and 37.1% respectively) (Table 3).

Table 3. How often do you visit agrotouristic farms?

Answer	Frequency	Percentage
Once a month	27	5.3
Several times a month	28	5.5
Once a year	128	25.2
Several times a year	108	21.3
I do not visit, but I intend in the near future	171	33.7
I do not intend because I'm not interested	46	9.1
Total	508	100

Relatively there is the least of respondents who do it once or more times a month and usually these are one-day family visits, while multi-day stays, from 7 to 10 days, are less common. One third of respondents has never visited the

agrotouristic farm, but intends to do so in the near future while only 9.1% do not intend to go because they do not have an interest.

The agrotouristic farms' attendance, in terms of gender and age is significantly determined by

the sample structure and is not different from the results of some other researches (Zrakić et al. 2015). Agrotouristic farms are equally visited by both: men and women, without major differences in age. A more significant problem is the seasonality of the visit and greatest attendance is, as well as for Zrakić et al. (2015), in the autumn and spring months while in the winter and summer the number of visits is smaller.

There are different motives of visiting agrotourism farms, as well as their different attitudes towards consumption. Most of the respondents (60.6%) are willing to allocate more money for something autochthonous and quality, the smaller part (3.5%) wants to get as much as possible for less money even if it is worse quality of products and services. More than a third of the respondents (35.8%) have an indifferent attitude, that is, they are only interested to be in the nature and outside the city crowd.

Franić and Cunj (2007) state that tourists to agrotourism come mainly from gastronomic reasons (domestic food and traditional beverages), while their interests in visiting the farm and domestic animals is in the second plan. According to these results, it is evident that it is necessary to introduce changes and improvements to the Croatian tourist offer and to "revive it" with something autochthonous, special and quality such as preserved varieties and breeds of domestic animals (Grgić et al.,

2015). In recent times significant media and other attention is devoted to food safety and in the part of discussion to the controlled use of agrochemicals and about autochthonous varieties and breeds. Although it is a less known breed of cattle, a significant proportion (40.2%) of respondents knows what the Busha is, while 59.8% said they did not know before this research.

The offer of Busha's processed milk and meat products at agrotouristic farm would cause 54.3% of respondents to visit them in curiosity, and for 45.7% of them does not represent an important factor in the choice of destination. Nevertheless, most of respondents (76%) think that it is necessary to preserve something domestic, special and autochthonous, and for that reason they would support the agrotouristic farm involved in Busha breeding. The smaller part of respondents (2%) believes that there are more attractive breeds that are more productive than Busha, and would not support such a farm, while 22% do not have an opinion about it.

A small supply of meat and processed products from Busha results in a small percentage (4.1%) of respondents who tried and who would do it again and only one respondent (0.2%) tasted it and would not repeat it. The vast majority, 76.8%, has not tried Busha's products so far, but they would like to, while 19% said they did not and would not like to (Table 4).

Table 4. Frequencies of Busha's products consumption due to gender of respondents

Gender	Have you tried meat and processed meat of Busha?				Total
	Yes and would again	Yes and would not again	No but would like	No and would not like	
Female	10 (2.0%)	0 (0.0%)	189 (37.2%)	77 (15.2%)	276 (54.3%)
Male	11 (2.1%)	1 (0.2%)	201 (39.6%)	19 (3.7%)	232 (45.7%)
Total	21 (4.1%)	1 (0.2%)	390 (76.8%)	96 (18.9%)	508 (100.0%)
Have you tried milk and processed dairy products of Busha?					
Female	14 (2.8%)	0 (0.0%)	211 (41.5%)	51 (10.0%)	276 (54.3%)
Male	14 (2.8%)	1 (0.2%)	198 (39.0%)	19 (3.7%)	232 (45.7%)
Total	28 (5.6%)	1 (0.2%)	409 (80.5%)	70 (13.7%)	508 (100.0%)

According to the analysis performed by crossing the sex variables and the frequency of Busha's products consumption, a statistically significant difference was observed between females and males at the significance level of 5% ($\chi^2=32.894$; $p=0.000$). Even 77 female respondents said they have never consumed Busha's meat and meat products, and don't even want it, while only 19 men have the same

opinion. The difference is even greater if we observe the relative share in the population and out of the total number of women 27.9% did not and would not try the meat of Busha, while the same opinion has only 8.2% of male's population. The reason why males are more willing to buy novel food is likely to be their adventurous tendency: for instance, Trickey (2012) found that males are more than

adventurous and carefree compared to females. When asked whether they tried or were willing to taste milk and dairy products, respondents responded almost the same as to the question of meat consumption. 80.5% of them said they would be happy to drink milk and eat dairy products, 5.6% of them taste it and would do it again, one respondent (0.2%) try it and would not again, 13.7% is not and would not like to taste it. According to conducted χ^2 test ($\chi^2=12.323$; $p=0.006$) there is a statistically significant difference between males and

females in preference to milk and dairy products. In the opinion of 70.5% of respondents, it is desirable to brand the products of Busha, 2.4% believe that this should not be done, until 27.3% have no opinion about it. In this way, 69.9% of respondents thought they would keep the breed alive, while 6.1% thought that branding would lead to excessive popularity and could have the opposite effect (destruction of Busha as an autochthonous breed). About a quarter of respondents (24%) have no opinion about it.

Table 5. The opinion about branding with respect to the educational structure of the respondents

Education	Branding the Busha's products would			Total
	be useful to keep the breed alive	contributed to excessive popularity and thus actually destroyed it	Have no opinion about it	
Elementary school	4 (100%)	0	0	4 (100%)
High school	141 (65%)	15 (7%)	61 (28%)	217 (100%)
University, Master and/or PhD	210 (73%)	16 (6%)	61 (21%)	287 (100%)
Total	355 (70%)	31 (6%)	122 (24%)	508 (100%)

The level of education of the respondents (Table 5) does not have a significant influence on the attitude about the contribution of the market number (brand) to the preservation of Busha as an autochthonous breed ($\chi^2=7.417$; $p=0.284$).

When it comes to the opinion of the respondents and potential beneficiaries of agrotourism farms about whether such farms should be particularly highlighted on tourism maps, 73.6% of them consider this to be desirable and would thus make tourists easier and increase their arrival to such farms. 26.4% of them believe that Busha is not so big attraction that the farms should especially emphasize. Croatia considers its gastronomy as one of the most important segments of tourism but also cultural offer to the Europe and the

world, based on tradition and on autochthonous products. Even 76.2% of the respondents believe that Busha will contribute to the enrichment of gastronomy, and the smaller part (8.7%) believes that, along with a number of natural sights, the gastronomy is secondary and that additional Busha's products would not be of major importance. It is often discussed about the role and the need for state incentives in agriculture. Most of respondents (74.2%) believe that farms with Busha should be additionally encouraged, 20.9% of them think that current incentives are enough, while the remaining 4.3% think that incentives should be abolish, the existing ones as well. Because the farms grow something different that they can get good money for.

Table 6. Average grades of respondents' attitudes according to the statements

N=508	Grade*	SD
Croatian agrotourism should be based on an autochthonous breed	4.44	0.832
Busha should be branded	4.42	0.865
The products of autochthonous breeds are much better than the products of commercialized breeds	4.25	0.972
Growing Busha for agrotourism would increase the number of employees and reduce the number of young people leaving the village	3.88	1.110
The only real driver of village development is tourism	3.72	1.313
The prices of autochthonous breeds should be considerably higher	3.67	1.157
If the product is of Busha I would paid much more	3.43	1.160

For Croatian agrotourism to be based on autochthonous breeds (4.44), think 90.1% of respondents. Indifferent are 5.7%, and not

agreed with this statement are 4.2%. Busha should be protected by branding (4.42) think 82.1% respondents, indifferent are

15.7%, while 2.2% does not agree. When asked if they agree that products of autochthonous breeds are better than commercialized breeds (4.25), 78.9% of respondents stated that they agree, 15.4% have no opinion, and 5.7% do not agree with that statement.

With the claim that agrotourism would open up workplaces in the rural area and keep the youth (3.88) 344 respondents agreed, 112 did not agree nor disagree, while 52 do not agree with this fact.

Tourism is one of the strongest drivers of the economy, but 64.9% of respondents agreeing that tourism is also the driving force for the development of the village (3.72), 15.2% are indifferent, while 19.8% of respondents do not agree.

When we talk about the price of a product it is always considered that something special, better quality, autochthonous and natural on the market has a higher price than commodity that is produced industrially. 61.8% of respondents agree with this statement, 30.5% of them don't agree but also don't disagree, while 20.3% disagree with the fact that the price of autochthonous products should be higher.

Whether consumers would be willing to pay a much higher price if there were a Busha's product (3.43), 49.2% said they would, 30.5% were indifferent, while disagreeing were 20.3% of respondents (Table 6).

CONCLUSIONS

Today's intensive cattle breeding do not recognize autochthonous breeds as economically efficient. As a result, their value is recognized in the non-economic factors of sustainable development of rural areas such as preservation of biodiversity, tradition, preservation of gastro-culture and identity. The Busha is a breed of cattle traditionally present in Croatia, whose low productivity in meat and milk production contributed to the status of highly endangered breeds.

In its revitalization, agrotourism can play an important role through the supply of meat and dairy products of this breed. According to research results among potential visitors to agrotouristic farms, there is a significant interest in Busha products. More than half of

the respondents would visit farms that offer foodstuffs from the Busha, and about 80% of respondents would gladly try the milk and meat products of Busha. The role of autochthonous products in agrotourism was confirmed by the opinion of more than 90% of respondents that agrotourism in Croatia should be based on autochthonous products.

Market demand for Busha products in Croatia has been demonstrated, whose low productivity can be compensated by higher market demand and potentially higher sales prices, compared to today's cattle breeds. The final decision on the financial and economic justification of Busha breeding should be made on the basis of additional analyzes of the level of consumer price willingness towards Busha's products as well as readiness of central and local government authorities to encourage non-economic factors of rural development.

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