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Source / Izvornik: **58. hrvatski i 18. međunarodni simpozij agronoma : zbornik radova, 2023, 385 - 390**

Conference paper / Rad u zborniku

Publication status / Verzija rada: **Published version / Objavljena verzija rada (izdavačev PDF)**

Permanent link / Trajna poveznica: <https://urn.nsk.hr/urn:nbn:hr:204:393128>

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Download date / Datum preuzimanja: **2025-01-12**



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Evaluation and gastronomic repositioning of beef from local cattle breeds

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Abstract

Local cattle breeds represent not only a genetic heritage, but also have significant economic and, above all, gastronomic potential. A considerable part of the public does not see the potential of these breeds for the preservation of the identity of the region, especially traditional and refined gastronomy. The observed opportunities for valorization and gastronomic repositioning of beef from local cattle breeds force the conclusion that it is necessary to involve all stakeholders in the food pathway to add value to the meat and provide a comprehensive gastronomic experience to the local population and visitors. The gastronomic valorization of Istrian cattle beef is an example of the successful transformation of lower value added meat into high quality meat that is recognized at the international level. The evaluation program for Buša breed beef is still in its infancy, as there are essential elements that need to be functionally linked. The quality of the meat should be at a high level, but also the traceability and presentation of the meat should be appropriate.

Keywords: local breeds, cattle, beef, gastronomy, evaluation

Introduction

In the second half of the 20th century, populations of local cattle breeds have undergone major structural and functional changes, and some of the local breeds were so neglected in terms of breeding and utilisation that they were pushed to the limits of biological survival. The trend of erosion of genetic resources, including cattle breeds, can be observed at national, regional and global levels. Of the total number of mammalian breeds used in agriculture, cattle breeds account for 22.90% (FAO, 2019). Although the number of extinct cattle breeds is relatively low (12.8%), a large number of breeds are endangered (21.1%), and for most cattle breeds the endangerment status is unknown (53.8%; FAO, 2019).

Local breeds reared in traditional farming systems contribute to maintain socio-cultural traditions and local identities (Zander et al., 2013; Marsoner et al., 2018) and support the resilience of agroecosystems and the conservation of traditional landscapes, which are often biodiversity hotspots (Fadlaoui et al., 2006). In addition to economic value, the importance of autochthonous breeds in preserving regional identity, living culture, and habitat biodiversity is also emphasized. Society as a whole now recognizes and appreciates the importance of local breeds and supports their preservation. This is also reflected in direct public (*governmental*) support for the preservation of autochthonous breeds and their inclusion in events and promotion of specific regions. However, it should be noted that the support system is necessary in the early stages of conservation and preservation of autochthonous breeds, i.e. in the phase of development, valorization and promotion of raw materials and products from these breeds. Only a balanced policy of support and development of economic programs, where incentives are compensated by the new added value of the product, ensures continuous progress and an incentive for the private sector to realize its economic benefits in the real sector (*breeding, processing, etc.*).

The value of local breeds as a genetic resource is particularly emphasized and, accordingly, the most common research in the scientific sense aims at learning more about the genetic structure, its peculiarities and phenotype. For local cattle breeds, registries have been established, breeding programs have been set up, and recognized breeding measures have been implemented to evaluate phenotype (*evaluation of young bulls and heifers*), pedigree (*maintenance of a balanced distribution of lines, verification of parentage*), and monitoring of certain production

indicators. However, the conservation of local cattle breeds *in vivo* depends largely on the motivation of breeders of local breeds, consumers of their products, other economic entities in the “food chain”, and the support of the local community for programs to conserve local cattle breeds. Complete and systematic information of the society (*community*) about the direct and indirect benefits (values) and potential of local cattle breeds shapes their attitude towards this issue. Depending on the level of information, the community may actively support programs to conserve local cattle breeds or, in certain situations, may refuse to support such initiatives if it does not see the justification and sustainability of such programs. There are also situations where the community perceives the justification and sustainability of these programs partly in a way that they do not understand their complexity and believe it's enough to give just direct financial support to solve the threatened situation. In most cases, this support has proven to be a “palliative” and communities give up after a certain period of time, considering these programs unpromising.

Previous studies focusing on the conservation, breeding, rearing, and profitability of endangered breeds have recommended that products such as meat from endangered livestock breeds could be sold as lucrative niche products (Verrier et al., 2005; Lauvie et al., 2011; Lambert-Derkimba et al., 2013; Tienhaara et al., 2015). This commercialization strategy, it is argued, would compensate producers for the higher rearing costs associated with these breeds or feeding environment, making the rearing of old multipurpose breeds more profitable for farmers while helping to stabilise current populations (Lauvie et al., 2011). Tienhaara et al. (2015) found that a larger number of Finnish consumers were willing to pay a tax to support native breeds via a national conservation programme than were willing to pay a higher price for “Finncattle” meat products. Customers are willing to pay, but they want a guarantee of quality for the product they paid for. The quality guarantee in this case is not the breed per se, although breed characteristics have some influence, but the quality of the meat that results from the cattle's high-quality nutrition. In such cases, an enlightened producer looks for a guarantee of quality in one of the established quality marks that are provided by the production specification of the product itself, or simply has confidence in the producer himself.

Valorization of local cattle breeds

The valorization of local breeds, especially in terms of their phenotype, is a continuous process within the program for the conservation of local breeds, as it serves as a control for breeding direction. Evaluation of genetic structure based on pedigree is continuous, while review of genetic structure is conducted at targeted intervals or as needed to closely monitor and correct population genetic trends. Economic valorization of local cattle breeds is important for their proper positioning. The ways of valorizing local breeds are diverse and can be either collective actions or individual initiatives. Collective actions involve farmers grouped in cooperatives or associations, as well as companies in charge of processing the products (official label for a product of higher quality) and individual initiatives are mainly based on direct sale, organic farming, or both (Lambert-Derkimba et al., 2013).

Recognition of actual use potential, while respecting economic and social trends, often leads to repositioning of use value, which can significantly improve the sustainability of breeding programs. There are well-known examples around the world of breeds that have been pushed to the limits of biological viability and economically repositioned, functionally and biologically reactivated. For example, the breeding of the Hungarian gray (*Magyar Szürke*) has been revitalized after it was included in the composition of organic production, conservation of national park ecosystems, quality beef production programs, etc. Examples of Aubrac breed (Béranger et al., 1970) or Tarentaise breed (Beaufort PDO cheese; Lambert-Derkimba, 2007), also indicate the potential of local breeds, which, if recognized and properly positioned, can be sufficiently profitable.

Croatian autochthonous cattle breeds were formed in the past as multipurpose breeds. The working function was extremely important, while the potential for meat or milk production was not developed in breeding because the breeding (*feeding*) environment did not support high milk yields and high daily gains. Adaptability to modest housing and feeding conditions was important, and informal selection modestly respected the breeder's preferences. The influence of public administration was limited and was mainly through the import and distribution of quality bulls. Therefore, the characteristics of local breeds is according with the farmers needs (*preferences for working animal characteristics resulted in coarser muscle fibers, slower growth dynamics, coarser carcass confirmation, lower ability to accumulate intramuscular fat, etc.*) than with the preferences of contemporary butchers or consumers.

Evaluation of local cattle breeds in today's world should take into account their unique characteristics, according to criteria they have developed themselves, which may or may not correspond to the criteria applicable to conventional cattle breeds. For example, Istrian cattle or Buša cattle can be evaluated according to the principles of ICAR, but

their valorization should be done in accordance with the breed standards and should not be considered with the standards of commercial breeds. When the production indicators of local cattle breeds are evaluated and compared with the indicators of commercial breeds, it is often concluded that local breeds are not sufficiently productive and competitive and should be replaced by commercial allochthonous meat or dairy breeds. Evaluation of conservation measures for agricultural genetic resources requires information on the use and non-use value of plant varieties and animal breeds, as well as preferences for *in situ* and *ex situ* conservation and using cost-benefit analysis in policy evaluation may shift the priorities of agricultural genetic resource conservation policies (Pouta et al., 2014). It is understandable that each breed of cattle has a certain production potential, but the question is whether it is sufficient to achieve a reasonable profit and ensure the sustainability of this production. Istrian cattle and Slavonian-Sirmian Podolian cattle are breeds with a larger frame, a relatively modest potential for milk production and a recognized potential for meat production. Buša is a breed with a smaller frame, compared to the frame of a breed with a more favorable potential for milk production than for meat production. When the above breeds are compared to commercial cattle breeds, the lower productivity level would usually be the reason for a less knowledgeable producer to reject the local cattle breeds as a production genotype. However, when they look at the breed as a whole and compare the production indicators relative to the weight of the animal, the local breeds take on a different meaning. It is also necessary to look at the production indicators and relate them to the quantity and, especially the quality of feed for animals kept on dry karst pastures, lawns and arable land. In such conditions, the breeds that provide high production indicators under the conditions of intensive production and feeding show relatively poor results, sometimes even lower than those of local breeds. The fact that the costs of health protection and treatment of local breeds are several times lower should also be taken into account. Finally, the calculation is not complete without taking into account the ecological landscape function of the local breeds, which produce on pastures, grasslands and arable land, where profitable intensive livestock production is not possible.

Gastronomic positioning of meat from local cattle breeds

The gastronomic valorization and positioning of the meat of local cattle breeds is complex because it requires the connection of all stakeholders of the “food chain” from breeders to consumers, including stakeholders involved in the transport of the animals, the slaughter, primary cutting, the maturation of the meat, the preparation of culinary cuts of meat, the chefs who prepare the meat, and those who present the meat (waiters). There are three basic principles to consider when positioning meat, which are important for meat quality, meat quantity, and continuity of meat availability. Understanding the supply chain from producer to consumer is an important step (Ligda and Casabianca, 2013). In the case of local breeds, the main points to consider include the capacity to provide a regular supply of products to the market, to gain a distinct position in the market and to identify new potential markets. In this process, all local stakeholders, even if they have different short-term objectives, according to their position as farmers, processors, retailers or consumers, should try to compromise, with the aim of achieving the main objective (common to all actors in the medium and long term) of providing a sustainable future for local breeds and for the region (Ligda and Casabianca, 2013). The continuity of quality must be unquestionable in all cases, while the principle of quantitative availability is used as a marketing tool in such cases. This is because meat that is not always available according to the rule of supply and demand achieves a higher price due to the increased interest of end consumers. This is precisely in this fact that the difference in price is hidden, justified by non-availability and recognized quality. The consumer is the last and most important link in the “food chain” and it is he who makes the final judgment about the quality of a given food product. Consumers form their opinions based on basic organoleptic criteria (*color, taste, smell, softness, juiciness, etc.*) and other available information about the meat (*breed, farm location, feeding conditions, sex, age, etc.*). The fact that consumers are informed about meat can have a significant impact on modeling their criteria for “meat quality” and they accept slightly darker, harder, or less juicy meat. Consumers do not significantly change their criteria for meat quality and, for example, rarely accept very hard or dark meat (*association with old or unhealthy food*). Such assumptions were created in the meat market during the “forcing” of non-native, highly productive breeds, which in fact created certain trends that are not justified from today’s perspective. In the last decade, local cattle breeds in Croatia have tried to position themselves in the production of quality beef by considering and promoting quality in the whole social and economic context. Following the principles of short supply chains, preference for local ingredients, comprehensive consumer information, spatial experience through local gastronomy, originality of meat and refined traditional gastronomy, an attempt has been made to reposition the

meat of local products. The result is that Istrian beef is the first meat in Croatia protected by a Protected Designation of Origin (PDO; EU Commission Implementing Regulation 2022/226; <https://eur-lex.europa.eu/>).

Breeders of local cattle breeds are the starting point for the gastronomic positioning of their beef, because through feeding and housing they can significantly influence the conformation and fatness of the carcass, the marbling and the overall quality of the meat. Local cattle producers who understand the cause-and-effect relationship between farm management and carcass/meat quality can achieve high and expected quality standards that enable other participants in the “meat route” to achieve high quality standards, all the way to the consumer, who rightfully has high expectations and a comprehensive food experience. To achieve the desired quality, certain guidelines are set for breeders, especially in terms of feeding, taking into account sex, age and season, to achieve the desired marbling, color, juiciness and flavor of the meat when the animal is slaughtered. For example, the specification for Istrian beef contains basic guidelines for feeding Istrian cattle, including guidelines for the use of fermented or concentrated feed. In Buša production, it is common to produce veal under extensive and grazing husbandry, which is justified given the allometry of tissue growth. The guidelines for such husbandry systems emphasize the need to keep calves together with cows and to use cow’s milk to feed the calves. Considering consumer preferences for veal, the production of veal based on the Buša genotype seems likely and justified, while Istrian cattle are preferable for beef production due to their favorable growth ability.

Slaughterhouses share responsibility in the gastronomic positioning of local breed meat for the process of preparing cattle for slaughter and primary processing of the carcass, which significantly affects the quality of the carcass and meat. For example, improper loading, transporting or unloading of animals can cause stress that leads to a decrease in glycogen reserves in the muscles, which are necessary for post-mortem processes in the meat. This then negatively affects the color of the meat and the pH₂₄ after chilling, making the meat less suitable to go through the “aging” process. Butchers are responsible for the primary processing of the carcass, the “cleanliness of the cuts” and the chilling of the halves. Poor initial carcass processing, and especially slow cooling of halves, have a significant impact on the shelf life of the meat and the microbiological integrity of the meat. After the carcasses are cooled, the halves are quartered or assembled, depending on the needs of restaurant chefs. Before or immediately after carcass cutting (*confectioning*), beef must undergo a process of dry or wet aging, at an interval appropriate to the structure of the beef cut (hardness of dominant muscles), age, and sex of the animal. Maturation is a common process that “softens” the meat through lipolytic and proteolytic processes and releases certain flavors. It must be performed on local breed beef to achieve the desired quality. Because chefs look for prepared meat when preparing meat directly in restaurants, butchers are often have the task of cutting larger cuts of meat into smaller cuts, suitable for different forms of preparation, either as fresh raw meat or for thermal preparation.

Restaurant chefs are the most important link in the gastronomic positioning of local breed meats, because the thermal processing of the meat or without it (e.g. carpaccio, sausages) makes the final product that is evaluated by the consumer. The question often arises whether to maintain traditional gastronomy or introduce modern culinary creations. However, since it is necessary to highlight the quality of meat with local breeds of cattle, this is only possible by refining traditional gastronomy, i.e. introducing modern gastronomic practices while maintaining a touch of originality in the creation of dishes. In doing so, preference should be given to the combination of different local products in order to achieve the full effect of local flavors. For example, you can combine “Boškarin beef” with local wine (Malvazia) and local olive oil. Gastronomic creations from the meat of local breeds should be regularly supplemented to keep consumers interested in new tastes. The synergistic effect of the characteristics of local agricultural foods has long been described by the French with the word “terroir” (*territory*). This synergy is crucial for positioning the region as a gastronomic region, i.e. the tastes and smells of the territory combined in traditionally prepared dishes or their modern derivatives provide uniqueness and harmony.

Proper presentation of meat (*dishes*) is very important for the full experience of meat dishes. Modern consumers, especially in restaurants with better gastronomic position, are interested in more information about meat. It is desirable to emphasize the originality of the meat and its special characteristics and, if available, to indicate the origin of the meat. Complete information about meat increases the consumer’s confidence in the quality of food, and such a consumer is willing to repeat the positive experience. An uninformed food establishment employee can create doubt in the consumer’s mind about the credibility of the information with a poor or incorrect presentation of the prepared meat.

Media channels (*local, regional and national; digital or printed*) are important for the gastronomic positioning of the meat of local breeds, especially from the point of view of presenting its values, but also informing the whole

community about the importance of preserving local cattle breeds and their economic valorization. In this context, it should be noted that the information from the program itself must be shared in a credible and timely manner with the media, which will recognize the importance of the project and provide the entire public with quality information to ensure visibility and the possibility that the economic valorization programs are recognized. The collaboration with the media and being consistent in informing and presenting the results of the program definitely exerts a high-quality “social pressure” that ultimately allows all stakeholders to recognize the value of the program and participate constructively in its implementation.

Gastronomic positioning of meat of local breeds of cattle is focused not only on restaurants, top gastronomic offer and tourism, but also on developing the habit of local consumers to consume locally produced meat of local breeds. The interest of the local community is very important for the complete positioning of the meat of local breeds of cattle. It is important that local consumers realize the importance of preserving local breeds, not only for the sake of the breed itself, but also for the other benefits that this preservation brings. In this case, the consumer feels connected to the product and the breed, is aware of their contribution to the programs, and is willing to pay for that added value. The consumption of all other local products in daily life is of great importance. The knowledge of the value of the products, their interconnectedness, the willingness to innovate and develop while maintaining tradition in all aspects, from primary production to consumption, is ultimately united in the “table culture” of a region that can ultimately sell its rooted values as its “way of life” (lifestyle).

Conclusion

Local cattle breeds can compensate for the loss of their local function through direct and indirect use values. Today's consumers expect added value from the food on offer and especially appreciate local products. Because of its special quality and meaty character, the meat of local cattle breeds can be appropriately positioned through a gastronomic offer that adds value to it, so that all stakeholders in the “food chain” from the producer to the consumer obtain greater benefits

Funding

Croatian Science Foundation (Genetic, Economic and Social Interactions of Local Breed Conservation Programs, GGD LocBreed), grant number IP-2020-02-4860.

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Vrednovanje i gastronomsko repositioniranje mesa izvornih pasmina goveda

Sažetak

Izvorne pasmine goveda ne predstavljaju samo genetsko nasljeđe već imaju značajan gospodarski, posebice gastronomski potencijal. Značaja dio javnosti ne sagledava potencijale ovih pasmina u očuvanju identiteta područja, posebice tradicionalne i oplemenjene gastronomije. Sagledane mogućnosti vrednovanja i gastronomskog repositioniranja mesa izvornih pasmina goveda nameću zaključak o potrebi uključivanja svih dionika u putu namirnice kako bi se meso oplemenilo dodanom vrijednošću te domaćem stanovništvu i posjetiteljima pružio puni gastronomski doživljaj. Gastronomska valorizacija mesa istarskog goveda primjer je uspješne tranzicije mesa niže dodane vrijednosti u meso visoke vrijednosti prepoznato na međunarodnoj razini. Program vrednovanja mesa buše je u začetku uz prisutnost bitnih elemenata koje treba funkcionalno povezati. Kakvoća mesa treba biti na visokoj razini, no istu treba pratiti primjerena sljedivost i prezentacija mesa.

Ključne riječi: izvorne pasmine, goveda, meso, gastronomija, vrednovanje