Contemporary Water Buffalo Farm Size in Romania and Actualized Milk Yields

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RESEARCH ARTICLE

Abstract
Since 1989 water buffalo numbers in Romania have dropped significantly because of multiple factors. In 1989, records showed a population of approximately 210,000, while today just 14,000 buffalo remain. In the past, buffalo played an essential role in the economy of many peasant homesteads. Contemporary buffalo farms have not evolved much regarding size, most farms exploit an average of 1.6 head, extremely low, as data from the Association of buffalo breeders in Transylvania show. Too little research is done. The actual milk yields and reproductive traits need to be analysed, as improvement is needed. This present study aims to showcase the dramatically reduced population and farm size and milk yields. Data was obtained from the Association, regarding buffalo registered for control. The information was analysed and conclusions derived. Most facilities have been indicated as homesteads with very few animals. 126 units have been grouped in farm sizes of 1-2, 3-4 and over 5 animals. Production data have higher values in units with over 5 buffalo. It is shown that extra support is needed for conserving, and expanding the numbers of buffalo reared. Production levels are low, need for improvement and genetic research is high.

Keywords: Bubaline; homesteads; actual production info.

INTRODUCTION

Water buffalo have been reared in the countryside of what is now Romania for a very long time, since they were introduced in the Vth century A.D., by various migratory people, as most specialists agree upon (Onaciu, 2006). They were brought from the East, or from the South, probably hauling supply carts or even war machines, and not being a neglected food source either. Their meat and milk were certainly used, and especially their hides were used for strong leather artefacts armour and siege mattresses. Native people eventually adopted water buffalo as well, being appreciated particularly for their strength under the yoke. Significant populations arose in the Danube plains and in the region of Transylvania. In the later, it seems that a particular fiscal context might have stimulated people to rear buffalo, as in some time periods under Austrian rule, buffalo were not taxed, therefore many impoverished Romanian families kept water buffalo (Iovânescu, 2007). These animals played an essential role in the economy of many peasant homesteads. The water buffalo adapted well to the
specific pedo-climatic conditions and became isolated from a reproductive point of view (Vidu et al., 2008). Up until the XXth century, bubaline numbers in the region flourished. A veterinarian, M. Vaida refers in 1923 that water buffalo just in the Old Romanian Kingdom (that excluded Transylvania and other smaller regions) numbered a staggering 185,280 (Vaida, 1923). After 1989, though, water buffalo numbers in Romania have dropped significantly. This happened because of multiple factors that contributed to the slow disappearance of the buffalo, as show in most scientific papers of the past decade. In 1989, records indicate a population of approx. 210,000 (Onaciu, 2006). Today, FAO 2020 estimations report just 14,000 buffalo are present in Romania (Minervino et al., 2020). The Association of buffalo breeders in Transylvania, recently made public the number of water buffalo females in the country as being 16,721 head. Unfortunately, contemporary buffalo farms have not evolved much regarding size, from the peasant homestead paradigm. Except for two large farms in Brașov, and a few others, most farms exploit an average of 1.6 head, extremely low, as derived from data obtained via the Association of buffalo breeders in Transylvania. The Romanian buffalo breed was recognized in 1987 due to the efforts of a scientific collective from Cluj. As stated, countless times before, action is needed to conserve and revitalise the species. Too little research regarding buffalo has been undertaken recently. Improvement strategies for the species exist, having been formulated in the recent past, and approved by national authorities. The problem with implementing such an improvement plan is exactly the reduced farm sizes, and small relatively isolated populations. Regarding improvement strategies, actual milk yields and reproductive traits need to be analysed, as it seems these traits are still low, thus making improvement vital. As well known, milking is also difficult due to strong mother-calf relations (Orihuela et al, 2021, Mota-Rohaj et al, 2019).

MATERIALS AND METHODS

For this study, 201 lactating buffalo were taken into account. They are from 126 farms, most located in Transylvania region from Romania. The purpose of the study was to evaluate bubaline performances in relation to exploitation sizes. The animals are mostly Romanian buffalo, with some being crossbred, as artificial insemination with seminal material from Italy was used in the past years. This study was elaborated using the data collected from June 2016 to December 2020 from the Association of buffalo breeders in Transylvania, which conducts the production controls. The animals were maintained in a seasonal system. Between the half of May and the half of October, buffalo were kept on pasture, while in the winter they were sheltered. Feeding involved grass on the pasture and hay in the winter with extra concentrates being administered. Initial data referring to quantity and quality of milk production as well as reproduction indicators like calving interval and service period, were analyzed and statistically interpreted. Aspects regarding daily growth were also discussed due to the monitoring of the 20 heads calves of buffalo nucleus reared at USAMV Cluj-Napoca - Cojocna farm as part of a research grant. For interpreting the data the IBM SPSS Statistics version 28 program was used. In order to properly compare the information from different exploitations and different aged animals, lactations were recalculated to mature equivalent milk productions, respectively to the Vth lactation. This is the lactation that encompasses the maximum potential. Data was also organized in three groups of analysis, on the criteria of farm size, as follows: farms of 1-2, 3-4 and over 5 animals reared.

RESULTS AND DISCUSSIONS

Information analysis revealed that most exploitations were of very little size, with an average of 1.6 animals. A hundred eleven out of 126 farms considered, reared between 1-2 water buffaloes. Romanian buffalo are reared at altitudes reaching 600-800 m, and endure warm summers and harsh winters, the specific temperate-continental climate of the region. This shows clearly the lack of industrial rearing of buffalo in the region, where only two larger farms exist in Brașov. These farms exploit over 500 head of buffalo, one of which being the Buffalo Research Centre. A few other farms that house over 100 buffalo cows exist in Arad and Iași. The Research Centre at Șercaia in Brașov still maintains a population of genetically valuable animals and breed lines. Very low exploitation size as well as aging farmers make improvement strategies very difficult to implement. Nonetheless, the data interpreted shows better results related to animals kept in bigger establishments, but not statistically significant, respectively farms of over 5 animals in exploitation, as shown in Figure 1. It appears that better performance is registered corresponding to the bigger farms, data shows that the average milk production for the water buffaloes is 1741.34 kg, with a maximum of 3656 kg. Other production indicators, such as fat content in milk has an average of 6.65% and 114.90 kg/lactation. Concerning milk protein values are in an average of 4.71% and 72.30 kg/lactation. In regard to these two indicators, higher values are reported in the third group of study, respectively 7.40% fat and 5.36% protein. This fact clearly evokes that larger farm implement better management than small homesteads. In order to conduct selection for improving future stock, larger farms are necessary as to supply a selection base. Regarding reproductive traits, contemporary data is in tone with the breed standards, respectively: calving interval of 447.18 days and age of first calving of 38.56 months (C. Velea et. all 2006). Therefore, calving interval averages 429.41 days, which is reduced with 18 days, from the standards, but still too long, especially considering that the
minimum value recorded is 298 days. Maximum value recorded for a calving interval from the animals taken into account is 675 days, which is a very long period that triggers economic loss.

![Figure 1: Milk production relative to water buffalo farm size.](image1)

As can be seen in Figure 2, high values for this indicator are recorded in the first group, consisting of small households and average values occur in the second group, consisting of homesteads that rear between 3 and 5 water buffalo. Figure 3 shows that the age of first calving is still high, respectively 38,36 months, with a minimum of 23 months and an unwanted maximum of 51 months. These results point out the low production levels and lack of improvement in Romanian buffalo.

![Figure 2: Calving interval of water buffalo relative to farm size.](image2)

These high values have a negative impact on production throw delayed breeding, aspects also highlighted by Parlato et al. in 2016, where constant efforts have been undertaken to reduce these intervals. Since in many countries buffalo rearing for dairy purposes attains more and more interest, Napolitano in 2020 considers that measures need to be taken for improving these parameters and accelerating the adaptation of these animals to intensive rearing systems, as is currently being done in the countries that rear buffaloes, especially Asian and South American ones. Some other countries have experienced population losses because of similar causes regarding consumer preferences and migration to urban areas. Other countries, like Italy, Egypt or Brazil have seen a rise in buffalo population due to consumer and farmer interest. Improvement strategies as intended need bigger populations, as previously stated. The national situation concerning buffalo population demise, as exhibited by this
paper and others (Vidu et al., 2013; Popa et al., 2018; Matiuti et al., 2020), was motivation for creating a small nucleus of water buffalo calves, females, and males, as to rebuild the university water buffalo stock, inexistent in the last decade. These animals were acquired from the Şercaia Research Centre, providing the best genetic quality available for Romanian buffalo. They are currently reared at The Educational and Experimental Centre of the University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Cojocna Farm, they are prior to weaning and have acquired satisfactory daily gains of 500-650g. Worldwide trends are starting to pick up buffalo meat as well, as 4.3 million tones had been produced in 2019, for example (Di Stasio et al., 2021). There is a growing market for buffalo milk products as well, consumers are starting to look for quality products such as those from buffalo. Therefore, there is a great need for collaboration between the universities, the dedicated research facility, and the associations for the greater benefit of this species, as it is also in a state of risk of abandonment in the country. Population numbers need to rise, as well as farm or heard sizes, and improvement measures implemented.

**CONCLUSIONS**

Water buffalo in Romania are losing ground in spite of new trends and niches of consumption. Overall population numbers are still regressing, actual information is relatively scarce, and the association of breeders is at a promising start, but with much work ahead of them. Collaboration between the institutions related to buffalo is vital in this hour of need as to ensure a future for this species. Farm or heard size is still very small, with very few exceptions, intensive rearing is not being practiced. It is shown here that extra support is needed for conserving, and expanding the numbers of buffalo reared. As seen in this paper and others before, production levels are not at the desirable values, they need to be improved thru selection and genetic research to be high. There is a imperative in creating larger populations so that improvement programs can be properly implemented, and not just on paper. It would be problematic to lose such a distinctive species from the treasure chest of biodiversity. Meat production could be resorted to, mother-calf lines could be reared semi-extensively, maybe providing sustainable development for small enterprises, a step above the subsistent homesteads of today.

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Conflicts of Interest
The authors declare that they do not have any conflict of interest.

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