Research Article

Azikheli buffalo productive performance under traditional management system in Swat Pakistan

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Abstract

Standard 305-day milk yield is the basis for genetic evaluation and making management and breeding decisions in dairy production. The current paper elaborates standard 305-day milk yield and the effects of parity and calving season on the trait in Azikheli buffalo under traditional management system in Swat, northern Pakistan. Data on milk yield was obtained from 108 Azikheli buffalo through the A4/2 method of the International Committee for Animal Recording (ICAR, 2004), And analyzed through analysis of variance to study the effect of parity and calving season with pairwise comparison through Student's *t*-test. The overall mean 305-day milk yield recorded was 2494.02±52.44 liters. Parity was observed as a significant ($P<0.001$) source of variation for 305-day milk yield whereas; calving season has no significant effect on the trait. Azikheli buffalo had a comparable 305-day milk yield to that of the Nili-Ravi and is well adapted to the mountain terrain and transhumance, hence wants conservation.

Keywords: Azikheli buffalo; Conservation; 305-day milk yield; Parity

Introduction

Estimation of milk yield is useful for breeding decisions and genetic evaluation [1] and among the milk yield traits, 305 days of milk production has the greatest influence on the dairy economy [2]. Buffaloes are generally considered suitable for hot, humid, and gentle riverside climates. However, in the semi-arid Hindukush Mountains, the pastoral communities retain a yet undocumented buffalo breed called Azikheli. The home tract of the breed is Swat valley in northern Pakistan. The breed is well adapted to mountainous terrain and transhumance. In comparison to other buffalo breeds of Pakistan, Azikheli has a shorter stature and the breed is known for its persistent milk

production. The total Azikheli buffalo population in Pakistan is 10, 7000 whereas, it is 68 % in District Swat as compared to other administrative units in the Malakand division [3]. The breed is important for the livelihoods of the community and shares for 80 % of the herd of the household. Indiscriminate breeding due to the unavailability of breeding bulls and lack of institutional support are the major threats to its dilution. Information on productive performance is a prerequisite for designing conservation strategies. The current study was therefore conducted to obtain information on the 305-day milk yield of the Azikheli buffalo to provide a basis for the conservation of the breed (Fig. 1).

Figure 1. The Azikheli buffalo breed of different ages at various locations of Khwazakhela Swat

Materials and Methods

Study area: This study was conducted in the Khwazakhela area of Swat valley. Swat is situated at 34.4° and 35 ° North and 72 ° and 74.6 ° East with 8220 square kilometers area and 600-6000 meters, with a human

population of 12, 49,572, [4]. Rainfall ranges from 1000-1750 mm/year with temperature ranges from -10 °C to 38 °C [5].

Management of the buffalo

Selected lactating Azikheli buffalo were stall-fed and offered water twice daily.

Feeding components include wheat straw, rice straw, green fodders (berseem, shaftal (*Trifolium alexandrinum*) and barley), concentrates (cottonseed cakes, wheat brans) and weed thinning during the spring season. In hot dry summer, no green fodder is available while in autumn and winter hay is included in the feeding regime of the buffaloes.

Data collection

Farmers who rear Azikheli buffalo were identified through the officials of the Department of Livestock and Dairy Development District Swat. On the basis of parity, thirty-six Azikheli buffalo each from first, second, and third parity were randomly selected from Khwazakhela. Milk recording was carried out according to the ICAR A4/2 method [6] with the help of 4 enumerators. Milk was recorded from parturition till day 300 of lactation [7] with the first record within the first two weeks of parturition. To obtain a 305-day milk yield, the methodology for projecting lactation records by estimating milk yield for the unknown part of lactation from the last test day milk yield was carried out according to [8].

Statistical analysis

Along with the descriptive statistics, analysis of variance was performed to study the effect of parity and calving season on 305-day milk yield using GraphPad Prism-5 (GraphPad Software, San Deigo, CA). Pair-

wise a comparison was carried out through Student's t-test.

Results and Discussion

Mean 305-day milk yield of Azikheli buffalo is presented in (Table 1). The overall mean 305-day milk yield (2494.02 ± 52.44 liters) was comparable to that of Nili-Ravi (2486.02 ± 11.03 liters; [9]. Parity significantly affects 305-day milk yield with higher yield in second ($t_{(70)} = 3.52$; $P < 0.001$) and third parity ($t_{(70)} = 4.55$; $P < 0.001$) than first parity. Significant effects of parity on 305-day milk yield have also been reported in Anatolian buffalo in Turkey with significantly lower 305-day milk yield in first parity [10], and in Nili-Ravi buffalo in Pakistan with significantly highest 305-day milk yield in second parity as compared to seventh parity [11]. Contrary to this, [12] reported a non-significant effect of parity on mean 305-day milk yield in Nili-Ravi buffalo in Pakistan. No significant effect of calving season was observed on 305-day milk yield. This might be due to the reason that traditionally Azikheli buffaloes are protected from seasonal and feeding stress. Similar results have also been reported in Nili-Ravi buffalo in Pakistan [13], and in India [14]. Contrary to the present study, [15] reported significant effect of season on milk yield in Nili-Ravi buffalo with more milk yield in winter calvers compared to autumn calvers.

Table 1. Standard 305-day milk yield (liters) of Azikheli buffalo in Khwazakhela valley of District Swat, Khyber Pakhtunkhwa, Pakistan

Source	Mean (liters)	Range (Liters)	Number
Overall	2494.02 ± 52.44	1293.23-4166.00	108
Parity			
First	2182.24 ± 77.16	1293.23-3452.34	36
Second	2557.71 ± 73.57 a ***	1846.85-3946.48	36
Third	2742.13 ± 95.91 a ***	1384.05-4166.00	36
Season			
Autumn	2362.30 ± 101.35	1384.05-3167.78	25
Winter	2316.41 ± 117.97	1736.16-2953.85	11
Spring	2405.93 ± 146.34	1879.26-2924.89	08
Summer	2587.02 ± 72.99	1293.23-4166	64

Mean $\pm$ SE, a= parity first vs second and third; b= parity second vs third; $P < 0.001$ ***

Conclusion

It can be concluded from this study that Azikheli buffalo had a comparable 305-day milk yield to that of the Nili-Ravi is considered the best buffalo breed in the world. Azikheli buffalo is also well adapted to the mountain terrain and transhumance production system. Therefore, Azikheli buffalo wants conservation as indiscriminate crossbreeding is a constant threat to this animal genetic resource.

Authors' contributions

Conceived and designed the experiments: M Khan, M Saleem & S Ahmad, Performed the experiments: M Khan, M Saleem & S Ahmad, Analyzed the data: Farmanullah, M Salim, IU Rehman, S Ali & M Malik, Contributed materials/ analysis/ tools: SU Khan, C Wajid & MU Kakar, Wrote the paper: M Khan, M Saleem & Farmanullah.

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