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Study On Phenotypic And Morphometric Characteristics Of Nilli-Ravi Buffaloes Calves At Livestock Research And Development Station, Paharpur Dera Ismail Khan khyber Pakhtunkhwa (KPK) Pakistan

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Abstract

A study was conducted at Livestock Research and Development Station, Paharpur Dera Ismail Khan khyber Pakhtunkhwa (KPK) Pakistan to document the phenotypic and Morphometric characteristic of Niliravi Buffalo Calves. Total 25 Niliravi buffalo calves were studied. Phenotypic characteristic were recorded visually. Majority (95.1%) of Nili ravi buffalo calves have black coat color with white forehead, muzzle, tail switch and lower part of the legs. Calves with black forehead and black lower parts of the legs have also been reported. Physical characteristic (color of coat, muzzle, face, eyelash, hooves and tail switch) were recorded visually. Morphometric measurements (heart girth, body length, height at withers, ear length, forehead length neck length and tail length) were recorded by using measuring tape. Mean heart girth, body length and height at withers were recorded as (38 ± 1.70) inches (28 ± 4.78) inches and (34 ± 1.26) inches, respectively. Average birth and weaning weight was recorded (33 ± 1.22) and (65.0 ± 5.00) kg, respectively. Average daily growth rate up to weaning of Niliravi buffalo calves was recorded 0.35 kg. Nilli-Ravi buffalo is an indigenous breed of Pakistan and is ranked as an important dairy breed of buffalo.

Keywords: Niliravi Calves; Phenotypic; Morphometric; Color; Body weight; Paharpur

Introduction

Nilli-Ravi buffalo is an indigenous breed of Pakistan and is ranked as an important dairy breed of buffalo. In selection of breeding animals, it is important to determine their prospective value at an early age. A study of birth weight as a measure of prospective value of calf is therefore justified since it is one of the first measures that can be obtained and also one of the easiest to record with reasonable accuracy. If phenotype at an early age is an expression of genotype, it should be possible to select superior individuals on the basis of their early performance. For a successful breeding program, an understanding of the degree of genetic, phenotypic and environmental association among traits is essential.

Characterization information is essential to design livestock conservation, development and breeding programs in management of Animal Genetic Resources (AnGR) at local, national, regional and global levels (FAO, 2012). Many efforts have begun to characterize animals in developing countries to provide a foundation for developing sustainable genetic improvement approaches.

Phenotypic characterization is used to identify and document diversity within and between distinct breeds, based on their observable attributes. Phenotypic characterization, including information of body biometry, is the prerequisite of all lesser known buffalo populations in order to provide overall picture of buffalo genetic diversity. Unless we know the physical and biometric characters besides accurate geographic location, population size, animal husbandry management practices, and utility of the particular animal breed, their overall improvement cannot be properly implemented. The phenotypic information will be the resources and basis for the establishment of further characterization conservation and selection strategies. Morphological measurements have been traditionally used for characterization of native animal breeds by many researchers. The morphometric data is useful tool in future strategies for cattle and buffalo breeding. Morphometric traits measurements can be an essential tool for the program selection and breed improvement. Thus, the techniques for the analysis of the morphometric are an essential ingredient for the programs of conservation and improvement [1-12].

The present investigation will be undertaken to study the phenotypic and morphometric characteristics as part of strategy for breed improvement program. Additionally the results obtained in current study would be useful to animal scientists and livestock producers for the efficient conservation and sustainable management of the local buffalo genetic resources by the appropriate use of these characteristics.

Material and Methode

Data of Phenotypic and Morphometric trait records from 25 Niliravi buffalo calves aging from one month to 03 months old were randomly collected at Livestock Research and development Station Paharpur Dera ismail Khan. Physical characteristic Color of coat, muzzle, face, eyelashes, hooves and tail switch were recorded visually.

Morphometric traits collected were Wither Height (WH), Body Length (BL), Heart Girth Circumference (HGC), ear length, forehead length, neck length, hoof circumference and tail length by using measuring tape. Birth weight and weaning weight was recorded by using the same electronic balance. Data were taken according to age (1-3) month, whole calves and sex (male, female). Studied calves belong to the Niliravi breed located at Livestock Research and development Station Paharpur Dera ismail Khan. Paharpur is a town of Dera Ismail Khan District in Khyber Pakhtunkhwa, Pakistan. It is located at 32°6'8N 70°58'12E and has an altitude of 173 metres (570 feet).

Housing and Feeding

Calves were kept with their relative dams after parturition for 5-7 days to suckle colostrum. After that they were kept separately in special pens during the day time after suckling from the dams and they rejoined the dams in the evening to suckle again. Concentrate of about (100-500) gram during the first 3 months of their age was given gradually to them during the day with an ad libitum grass. Water and mineral blocks were given as ad libitum. Calves were housed in pens fenced by steel pipes. They were half shaded with one part concrete ground facilitated with feeders and water supply and the other non-concrete for exercise and sun exposure. Pens were well ventilated with wide windows and fans.

Result and Discussion

Phonotypical and Morphometric characteristic

Table 1 showed the phenotypic characteristics of Nili ravi buffalo calves. Majority (95.1%) of Nili ravi buffalo calves have black coat color with white forehead, muzzle, tail switch and lower part of the legs.

Calves with black forehead and black lower parts of the legs have also been reported by Saleem et al. (2013). Variation in coat color depends upon geographical and climatic environment. Muzzle was gray to whitish in color with black pigment. Eye lashes were blackish in color but animals with grey eyelashes have also been observed. The hooves were gray in color but calves with light brown and black hooves have also been observed. Switch of the tail was white and black in color. Similar phenotypic characteristics have also been reported by Muhammad.

Various morphometric measurements play key role in demarcation and identification between and within various buffalo breeds. Within the breeds variation in morphometric measurement reflects adaptability of breed to a specific production system.

Table 2 shows the morphometric measurement of Niliravi buffalo calves. Mean heart girth, body length and height at withers were recorded as (38 ± 1.70) inches (28 ± 4.78) inches and (34 ± 1.26) inches, respectively. Similarly results of mean heart girth, body length and height at wither of calves was recorded (36 ± 1.70) inches (26 ± 4.78) inches and (36 ± 1.26) inches. Similarly Muhammad Saleem et al. (2010) reported the average heart girth, body length and height at wither of (37 ± 1.70) inches and (33 ± 1.26) inches respectively. Tail extending down size; neck was short, strong and well developed particular in males was reported mostly in this study. Tail extend down well below (23 ± 1.332) inches with a fluffy white switch but animals with reddish brown switch have also been observed which is in line with the results of Muhammad Saleem et al. (2010). The legs were short thin. The rear legs were pointed out ward and forwarded from hock joint. Similar results have also been reported by Muhammad Saleem et al. (2010). Niliravi calves were moderate sized breed having medium stature as indicated by the heart girth: body length and height at wither (**Table 2).** Its body size may be the result of natural selection, to meet fodder scarcity in harsh climatic condition so this breed has high adoptive capacity to the environmental conditions. These animals may survive better during fodder shortage (Hall, 1998) and can move easily for grazing.

Average birth and weaning weight was recorded 33±1.22 and (65.0 ± 5.00) kg, respectively. These finding are in line with the finding of who reported (31 ± 0.49 and 66 ± 0.84) kg birth and weaning weight, respectively. Average daily growth rate up to weaning of Niliravi buffalo calves was recorded 0.35 kg. Similar findings have been reported by Rajwali et al. (2012) who reported mean daily growth rate up to weaning 0.33 kg.

Table 1: Phenotypic characteristic of Nili ravi buffalo calves.

Variable	Color	Percent (%)
Coat	Black Coat	95.1
	blakish brown	4.9
Face	black+white markings	90
	black	10
Hoof	Gray	81.25
	Light brown	12.5
	Black	6.25
Switch of tail	White	85.5
	Reddish brown	14.5
Eye lashes	Blackish	71.87
	Reddish	28.13
Muzzle	Gray with black pigment	87.5
	White	12.5

Table 2: Morphometric measurements of Nili Ravi buffalo calves.

Variable	Min value	Max. value	mean	Mean SE
Height (inch)	28	37	34	4.16
Body length (inch)	22	33	28	4.78
Face length	10	13	12	0.502
Ear length	6	9	8	0.469
Tail length	15	26	23	1.332
Chest girth	29	42	38	0.978

Conclusion

Nilli-Ravi buffalo is an indigenous breed of Pakistan and is ranked as an important dairy breed of buffalo. Constant threat to Niliravi breed is indiscriminate breeding due to the lack of pure breeding bull and pure semen which results in losing its breed's trails. Documenting its phenotypic and Morphometric characteristics can help in improving its breed's trails. A conservation program has been initiated by the Department of Livestock and Dairy Development Department of the Khyber Pakhtunkhwa but the capacity and scope still needs improvement.

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