



Short Communication

Exclusive Characteristics of the Bhag Nari Cattle among the Other Indigenous Cattle Breeds of Pakistan

Irshad Ali¹, Mohammad Masood Tariq^{2,*}, Abdul Waheed², Ferhet Abbas Yousafzai¹, Farhat Abbas Bokhari¹, Majed Rafeeq¹, Muhammad Ali¹, Muhammad Adnan Attique¹, Shahid Amin³ and Tahir Hameed¹

¹Center for Advanced Studies in vaccinology and Biotechnology (CASVAB), University of Baluchistan, Quetta

²Faculty of Veterinary Sciences, Bahauddin Zakariya University, Multan

³Livestock and Dairy Development Department, Govt. of Baluchistan, Quetta

ABSTRACT

The base line study carried out on Bhag Nari (BN) cattle breed to explore morphological, biometric parameters, its production system, and survival in the existing habitat. The data on morphology and performance of 1020 Bhag Nari (BN) cattle were collected from Bhag Nari cattle Farm, Usta Mohammad Baluchistan during 2015-16 and its surrounding areas. Some distinct characteristics have been found exclusively in Bhag Nari breed. These characters are rare in other local breeds of the area such as tick resistance, tolerance against > 50°C temperature in the hot weather nevertheless still gives good productive results. It has extraordinary long limbs which protect them from very heated ground. The odor of BN animal sweat is so pungent that helps it in tick resistance. The white color of the skin is natural reflector in an extreme weather, whereas, the inner coat of this animal has black lining (the natural insulator), provides an excellent insulation capability against heat. Furthermore, very large pendulous dewlap and naval flap provides larger skin surface area to the animal to protect it from extreme weather conditions. Sexual dimorphism was found with regard to growth in these animals. The overall means for birth weight (B wt), and weights at 120 days, 180 days, 240 days, 365 days, 730 days and Pre weaning average daily weight gain (Kg) were 25.74±3.7, 101±6.70, 150±17.00, 163±6.8, 189±6.80, 475±21.17 and 0.71±0.13, respectively. Male had higher height at wither, chest girth and length compared to female (P<0.05). It is suggested that Bhag Nari cattle were distinct breed and having upright potential of growth. It could be efficiently used to evolve a new beef breed of the area.

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Authors' Contribution

IA, MMT, AW and FAY designed and conducted the study. FAB, MR, MA and MAA collected the data. IA, MR, SA and TH analyzed the data. IA, MMT, AW, FAY wrote the manuscript.

Key words

Bhag Nari, Biometry, Insulation, Pendulous dewlap, Morphological characters, Novel features.

Bhag Nari (BN) breed is the off shoot of indigenous Brahma, the Zebu cattle (*Bos indicus*), having the fore fathers of Gir, Kankrej, Gujarat, and Ongole with 25% blood contribution of each breed. The lower productivity of the indigenous cattle is always compensated by their lower feed consumption and higher disease resistance (Sarkar *et al.*, 2007). Despite Pakistan is among the first five milk producing countries but still lowest in per capita availability of dairy products (GoP, 2016). They are having the great adaptability for harsh climatic conditions of the Baluchistan. Many workers have used correlation among body parameters to assess the mutual dependence and relationship among different body point and possibly implicate the genetic control of restrain body

parts on the same genomic region (Bidner *et al.*, 2002), whereas some researcher indicated the underdeveloped genetic improvement and poor production system (Kantanen *et al.*, 2006).

It is reflected that natural habitat of Bhag Nari breed is in three districts (Bhag, Kacchi, and Ustta Muhammad) and the surrounding villages of this area. People of the area have affection to keep these animals for their livelihood as well as for their pride. This breed is well adapted to the harsh climate and rough environmental conditions of the area (Akhtar *et al.*, 2015). However, when matched the performance of this breed with exotic breeds of the world than one can easily feel that there is need of lot of improvement in the productivity of these animals. However, this breed has already enough potential phenotypically as well as genotypic associate to be a good beef breed in this region (Khan and Khan, 2001). According to the projected census of Livestock Pakistan 2016 the present situation is

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good enough in numbers; Pakistan has 64.9 million heads of cattle's, whereas Baluchistan has only 3.87 million, the lowest as compared to other provinces of the country (GoP, 2016). It is reported that indigenous animals are not good in the production characteristics because of the lower productivity of the animals, especially in the field of milk and meat or beef production. Over the years in advanced dairy/beef industrial countries intensification of animal husbandry plus widespread introduction of exotic breeds has completely altered the genetic resource scenario which makes this industry highly promoted and profitable (Tariq, 2011). Therefore, it is need of the hour to improve this deprived region to work hard on the same advance scientific lines as has been done by the developed countries. In advanced dairy development program some genetic characters can be measured by using advanced techniques in animal selection program, genomic selection like genetic engineering, gene mapping (AGNR, 2016).

Bhag Nari breed has great potential to be a beef breed of the area if the advance techniques will be used in animal selection and other management practices. Other phenotypic parameters like pure white body color, tick resistance, converting the low quality feed into valuable product are quite wondering. This kind of knowledge might be needed to assess the animals not only through the biometry but it is also essential for analyzing the other factors which cannot be ignored at the time of selection of the breed. Body parts measured objectively could be improved through selection for growth by enabling the breeder to recognize early maturity or late maturity of different size (Acharya, 1982; Riva *et al.*, 2004), furthermore in this regard especially in this study, the animal body dimensions could be achieved by assessing the animals by the biometric traits but other factors can also play an important role in evolving the better breed.

In this study major component analysis not only be measured the body parts but it also focused to assess the other genetic potential which gave the animals some an extra ability to thrive well in an extreme hot climatic conditions (Kumar *et al.*, 2004), giving good enough results but also thrive well in low quality feed resources and tough conditions. These types of resources or support might needs quiet innovative and very specific technical knowledge, researchers must be equipped with an extra knowledge to perform this very technical work efficiently which might have great impact on the evolution of better breed development programs, not only in this province but also in the whole country (Riaz *et al.*, 2008).

Materials and method

Present study was conducted on Bhag Nari cattle (n=1020) to assess their biometric traits as well as some

of their performance traits in Baluchistan province of Pakistan. Bhag Nari cattle are native to the town and are kept at Government Livestock Farm at Ustta Muhammad near Sibi in Baluchistan for breed improvement purpose. Biometric data of the Bhag Nari cattle present at its natural habitat like Ustta Muhammad, Kacchi and Bhag peripheral villages of these districts area of Baluchistan was collected. Biometric traits data were collected from each district included 5 villages and 20 household randomly selected in every village keeping different number of animals in their houses. A very comprehensive information regarding its habitat, breeding, feeding, housing, management, production system, health/vaccination, utility pattern and the constraints like poor selection system, poor feeding and management system was also collected.

Qualitative (morphological) characteristics included sex, coat color, horn shape, hump, tail color, hooves color and fore head color.

Quantitative (physiological) characteristics; body weight in different age groups, measurement of body dimensions included males (n=495) females (n=525). Body measurements included body length, heart girth, chest girth, belly girth, fore head size, rump height, hump size, ear length, ear width and horn length and distance between the poles.

Information about production and management system, calving, season, and sex ratio was also collected. It is also includes the phenotypic characters such as body color, hump color, body type, fore head color, tail color, ear type, ear color.

All the measurements were taken from animal with the help of measuring scale, especially designed for this purpose. Fixed effect model was employed for studying the influence of various factors on performance traits. The data were statistically analyzed by using Statistics' software (Version 8.1) for descriptive statistics and ASReml for genetic parameters.

Results and discussion

Morphological characteristics: The results of qualitative characteristics of Bhag Nari cattle (n=1050) are presented in Table I. This study revealed that Bhag Nari had compact and massive well-proportioned body, have long limbs, a medium head, ears are medium and pointed, and horns are stumpy black in color, whereas the whole body has grey and white complexion with a great look. Several diverse features have been found in Bhag Nari breed in this study. These characters are rare in other local breeds of the area such as tick resistance, to resist 50°C plus temperature in the hot weather nevertheless still gives good productive results, long limbs which protect them from very heated ground. The odor of BN animals sweat is so pungent that

the ticks do not come nearby to them. The white color (natural absorbent), of the skin is natural reflector in an extreme weather, whereas, the inner coat of this animal has black lining (the natural insulator), provides an excellent insulation capability for the heat absorption. Additionally very large pendulous body skin like dewlap and naval flap provides larger skin surface area to the animals to protect them from an extreme weather conditions.

Table I.- Qualitative characteristics of Bhag Nari cattle (n=1020).

Traits	Appearance	Traits	Appearance
Head	Medium / gray	Dewlap	Little bit longer
Eye lid	Black	Horn color and arrangement	Pointed, and stumpy black in color
Muzzle	Black	Limb organization	Long and solid
Forehead	Medium /Gray	Switch of tail	Always black
Belly	Whitish	Hind quarters	Heavy fleshy and compact
Ear dimension	Medium and pointed/whitish gray	Hooves	Black
Neck	Medium neck,	Over all body arrangement	Compact/greyish white complexion

Table II.- Least means square of productive performance of Bhag Nari cattle.

S No.	No of Obs.	Traits	Means±SE
1	1020	Birth weight (Kg)	21.74±3.70
2	925	120 days weight (Kg)	101±6.70
3	925	Pre weaning weight gain (Kg)	0.51±0.13
4	790	180 days body weight (Kg)	150±17.00
4	790-	240 days weight (Kg)	189±6.80
5	780	365 days body weight (Kg)	290±20.10
6	710	730 days live weight (Kg)	475±21.17

The overall means of productive performance of Bhag Nari cattle is presented in Table II. In both production systems, sex had a significant effect on growth performance. These are in agreement with the findings of Tariq (2011) and Mussarrat *et al.* (2015) and reported that sex had a significant difference on growth performance.

The results of Effect of Environmental Factors on Productive Performance are presented in Table III. Environmental factors such as age and year of birth had non-significant effects ($P>0.05$) for all weights. However, sex was found highly significant ($P>0.01$) for all weights.

Table III.- Effect of environmental factors on productive performance.

Traits	YOB	MOB	Sex	Age
Birth weight	NS	NS	**	NS
Pre weaning weight gain	NS	*	**	NS
120 days weight	NS	**	**	NS
180 days weight	NS	*	**	
240 days weight	NS	**	**	NS
365 days weight	NS	NS	**	NS
730 days weight	NS	NS	**	NS

YOB, Year of Birth; MOB, Month of Birth

Table IV.- Least means square (Means±SE) of some biometric traits of Bhag Nari cattle.

Traits	Male	Female
730 days body weight (Kg)	475±21.17 ^a	397±19.42 ^b
Heart girth (cm)	240±17.21 ^a	227±15.12 ^b
Body length (cm)	170±14.25 ^a	161±13.45 ^b
Wither height (cm)	131±15.11 ^a	131±12.13 ^b

Body measurements: Result of Least square means (Means±SE) of some Biometric performance of Bhag Nari cattle displayed in Table IV. In biometric traits, male had significant difference in height at wither, chest girth, rump height, body girth and finally the body weight as compared to female animals. Live body weights and carcass weight were higher in male significantly than females. Biometry is the most important portion of the physical traits (Sarkar *et al.*, 2007; Sodhi *et al.*, 2006; Tariq *et al.*, 2013). Present results for body measurements confirmed findings of Acharya (1982), who analyzed the data on biometry, productive, reproductive performance and survival of (Juliann and Malpura) and (Sonadi) sheep of India, respectively. They concluded that male sheep were heavier in weight and higher in body measurements (body length, withers height, chest girth) when compared to female ones. Raziq *et al.* (2010) evaluated the productive performance of the five breeds of sheep prevailing in different parts of the Baluchistan province, observed to be significantly different among breeds ($P>0.05$) for withers height, body length and chest girth. Consistent growth performance was found in Mengali and Balochi compared to other breeds. They concluded that, genetic potential of breeds and environmental factors might lead to variations in productive and body measurements performance.

The results of factors effecting on Environmental on Biometric traits are presented in Table V.

Table V.- Factors effecting on environmental on biometric traits.

Traits	YOB	MOB	Sex	Age
Body length	NS	NS	*	*
Heart girth	NS	NS	*	NS
Wither height	*	NS	*	NS
Live weight	NS	*	**	**

For abbreviations, see Table III.

Conclusions

Biometric traits were affected by some non-genetic factors and were significantly differed between male and females. Wither height appeared to be affected significantly by year of birth while live weight was different for month of birth. Age had significant influence on body length and live weight. It was concluded that effective breed improvement program should be launched to exploit and improve this important animal genetic resource of Pakistan in its native place.

Statement of conflict of interest

Authors have declared no conflict of interest.

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