



Original Research

Study of Temperament and Phenotypic Traits of Murrah Buffaloes

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Abstract

The study was conducted to find the relationship between various breed characteristics of Murrah buffaloes with the milk yield. The phenotypic characters studied were brisket distance, head type, face type, horn pattern, tail switch color, udder depth, teat tips, teat shape, rear attachment of udder, fore udder shape, rear udder shape and temperament. These breed characteristics (head type, face type, udder shape etc.) were further studied to establish a direct relationship with lactation yield. Docile behavior of animals was associated significantly ($P < 0.05$) with high milk yield than aggressive and nervous animals. It was inferred from present study that flat head and wide brisket animals will produce significantly ($P < 0.05$) more milk. Milk yield was found closely related with most of phenotypic characters studied in relation to udder viz. teat shape, udder depth, rear attachment, rear and fore udder shape.

Key words: Breed, Brisket, Milk Yield, Murrah, Phenotype, Temperament

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Introduction

The world buffalo population is continuously increasing and was estimated at 185.29 million; spread in about 42 countries, of which 179.75 million (FAO, 2008) are found in Asia. More than 97 percent of the world buffalo population is found in Asia where buffalo plays a leading role in rural livestock production. India will produce 191 million tonnes of milk by 2020 (DNA, 2012). Murrah breed of buffalo, the pride of Haryana, is a milk type animal. The home tract of Murrah buffalo is Rohtak, Jind, Hisar and Bhiwani districts of Haryana. It is also found in Nabha and Patiala districts of Punjab and around Delhi. It has been exported to Brazil, Bulgaria and many countries of eastern Asia for the purpose of upgradation of local available breeds. Murrah buffaloes have jet black body coat colour but dark tan animals are also commonly



found. This animal is large in size with long and deep body. Horns are short and tightly curled in a spiral form which is typical character of this breed because of this it has been given the name “Murrah”. Head of females is usually short, fine and clear cut. Tail is black, long reaching below the hock up to fetlock and in some animal ending in a white switch. The skin is thin, soft and pliable with very little hair on the body in adult animals.

Information has been documented about skeletal structure, body parts as well as use of the unified score card for type evaluation of exotic dairy cows. For establishing a score card based on dairy character in respect to milch buffalos more scientific research work has to be carried out in terms of skeletal frame (15%), dairy strength (25%), rear feet and legs (20%), udder (40%) for establishing a dairy score card (as in exotic cattle). Such dairy character based score card will not only be useful for improving buffalo milk production, breeders in selection, judges in the buffalo judging competitions but also for the farmers. Therefore, it was considered imperative to undertake this study to generate information on important phenotypic characters for lactating Murrah breed, so the potential of the animal would appropriately be judged and selection would be made in positive direction. The body structure of milking animals is not only important to demonstrate the beauty of dairy animals but also for their high milk productivity and the expected relationship with milk yield. It was reported that both morphological and physiological mammary properties affect the milk yield in cattle (Tilki *et al.*, 2005). But not much research was done on the udder and teat morphology and their influence on the milk yield in buffaloes. Hence, an attempt was made to study the temperament, phenotypic variations in Murrah breed and their relation with milk yield in Murrah buffaloes.

Materials and Methods

Seventy lactating Murrah buffaloes irrespective of parity on the basis of availability of milch buffaloes were selected from Buffalo farm of the Department of Livestock Production Management of College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar. These buffaloes were grouped into different categories based on level of variation in the morphological characters of each animal. The temperament or social behaviour of animal was classified into three categories during the restraining and milking time as:

1. **Docile:** The buffaloes which were easy to restrain and calm while feeding, milking and rarely move, except to raise or lower their heads. They are “Ideal milkers” and generally not affected by milking procedure.
2. **Nervous:** They appear very restless during restraining as well as during the preparation for milking. Generally appeared quiver when body measurements were taken. Flick the tail quickly and kick the handler occasionally.
3. **Aggressive:** These are restless animals which struggle during restraining as well as violent, also bellow and froth during milking. Attack milker by kicking or attempting to “butt” by lunging forward.

The head of Murrah buffaloes was categorized in two categories on the basis of deviation viz. flat and bulging. Buffaloes were classified on the basis of visual observation in to three categories viz. short, long and heavy face type. Horns of Murrah buffaloes were classified in three categories which were open, short tightly curled and medium loosely curled on the basis of curling and typical shape of horns. Brisket distance was also classified in to three categories on the basis of visual observation in to wide, medium and narrow; these observations were recorded from a distance in front of the buffalo. Teats were observed grossly to know the shape of teats and classified under three classes viz. funnel, Bottle shape teats are second most frequent teat shape found in buffaloes and they are larger at the base while cylindrical are the most frequent shape of teats than others and they are longer than other two. They are long and look like a peculiar cylinder. Teat tips were also observed grossly from a convenient distance and were categorized in two categories viz. round and flat as described by Bhardwaj *et al.* (1991). Udder depth was observed grossly and classified in two classes viz. long and short. The tail was also classified into three categories i.e. black tail black switch, black colored tail with black hair switch and white tail white switch.

Statistical Analysis

For phenotypic characters analysis of data was done to find out the relationship between different phenotypic characters and milk yield as per the method described by Snedecor and Cochran (1994) for one way classification of data.

Result and Discussion

The study revealed that out of seventy buffaloes 71.43% were docile, 21.43% were aggressive and 7.14% were nervous, respectively. The overall lactation yield (305 days) was 2605 kg and the milk yield of docile, aggressive and nervous buffaloes was 2848, 2005 and 1962 kg, respectively. The buffaloes with docile temperament produced significantly more milk yield than aggressive and nervous buffaloes. It was found that milk yield of docile animals was greater than the aggressive and the nervous animals. The docile character was found in majority of high yielding buffaloes. The results are found in agreement with study done by Bharadwaj *et al.* (2007) who reported that milk production of docile buffaloes was significantly higher than nervous and aggressive Murrah buffaloes. Gupta *et al.* (1985) noticed that docile Nili-Ravi buffaloes give significantly higher milk yield (4.58) than aggressive animals and also found that docile animals have shortest milking time than aggressive animals. Dash *et al.* (1976) found that an increase of 1 point (In five point scale) in temperament score during milking was associated with decrease in milk yield @ 0.81 kg. Bharadwaj *et al.* (1991) reported that there is relation between temperament and milk yield, same results were observed in this study also.

The study revealed that flat head buffaloes were 77.14% while the buffaloes with bulging head were 22.86%. Milk yield of buffaloes with flat and bulging heads were found to be 2636 and 2498 kg, respectively. The difference in production level was observed, significantly higher milk yield was produced by the buffaloes with flat head than buffaloes with bulging head. The present study was in agreement with the finding of Bharadwaj *et al.* (2007) who reported that buffalo possessing flat head buffaloes yielded significantly higher milk than buffaloes with bulging head in Murrah breed. The study was not in agreement with study done by Shrikhande *et al.* (1996) who reported that majority of Nagpuri buffaloes had a bulging forehead.

The mean milk yield of the buffaloes with short, long and heavy face was 2573, 2581 and 2748 kg, respectively. The milk yield of the heavy face animals was higher than the animals having short and long face. But the difference was not significant. Majority of buffaloes were having long face followed by short and heavy face. The results were not in agreement with study done by Bharadwaj *et al.* (2007) who found that there was no difference in milk yield with type of face but found that farm buffaloes with short face had higher milk yield than heavy and long face. Horn pattern of the buffaloes was classified in to three classes and it was found that the animals with short tightly curled horns (47.14%) were near about half of buffaloes followed by medium loosely curled (35.71%) and open horned animals (17.14%). The mean lactation milk yields of the buffaloes with short tightly curled, medium loosely curled and open horn were 2550, 2552 and 2861 kg, respectively. No significant difference in milk yield was found between types of horns. The study revealed that milk yield was not associated with horn pattern and the study was not in agreement with Bharadwaj *et al.* (2007). The percentages of buffaloes with wide, medium and narrow brisket found were 58.57, 28.57 and 12.80 %, respectively. The mean milk yields of buffaloes with wide, medium and narrow brisket were 2636, 2577 and 2434 kg, respectively. Milk yield of buffaloes having wide brisket was significantly higher than the buffaloes with medium and narrow brisket. The study revealed that milk yield was significantly higher in buffaloes with wide brisket than the medium and short brisket distance. The study was found to be in agreement with Kar *et al.* (2014).

The mean milk yield of buffaloes with deep and shallow udder depth was 2736 and 2078, kg respectively. Milk yield of buffaloes with long udder depth was more than the animals with short udder depth and study was in agreement with the findings of Singh and Bhatanagar (1977) who noticed that the width of the udder played more important role than the length of the udder in milk production of Brown Swiss cattle, whereas, on the contrary the length of udder in the buffaloes played an effective role in producing more milk. Hafeez and Naidu (1981) reported that milk yield was significantly related with udder width and length in buffaloes. Bhuiyan *et al.* (2004) indicated that in dairy cows size and depth of udder are very important conformation traits for milk production. Significant influence was also observed for rear attachment of the udder with milk yield. The mean milk yields of buffaloes with long and short rear udder shape was 2684 and 2290 kg,

respectively. Lactation milk yield was significantly higher in buffaloes with long rear udder than short rear udder.

Table 1: Effect of phenotypic characters on the lactation milk yield in Murrah buffaloes

Phenotypic Characters	Frequency	Percentage	305 Days Lactation yield (kg) (Mean ±SE)
Temperament			
Docile	50	71.43	2848 ^a ±33.29
Aggressive	15	21.43	2005 ^b ±21.64
Nervous	5	7.14	1962 ^b ±39.11
Head type			
Flat	54	77.14	2636 ^a ±58.05
Bulging	16	22.86	2498 ^b ±80.47
Face type			
Short	11	15.71	2574±114.44
Long	49	70	2582±64.13
Heavy	10	14.29	2748±145.12
Horn pattern			
Short tightly curled	33	47.14	2550±96.10
Medium loosely curled	25	35.71	2552±73.66
Open	12	17.14	2861±88.79
Brisket distance			
Wide	41	58.57	2636 ^a ±70.73
Medium	20	28.57	2577 ^b ±87.99
Narrow	9	12.8	2434 ^c ±166.73
Rear udder shape			
Long	55	78.57	2684 ^a ±55.30
Short	15	21.43	2290 ^b ±107.72
Fore udder shape			
Long	53	75.71	2775 ^a ±45.22
Short	17	24.29	2074 ^b ±69.55
Rear attachment			
High	45	64.29	2861 ^a ±36.12
Low	25	35.71	2114 ^b ±63.85
Teat tips			
Round	46	65.71	2597±47.77
Pointed	24	34.29	2644±68.75
Teat shape			
Cylindrical	44	62.86	2648 ^a ±68.95
Bottle	26	37.14	2530 ^b ±73.85
Udder depth			
Long	56	80	2736 ^a ±49.16
Short	14	20	2078 ^b ±73.16
Tail switch color			
Black tail black switch	25	35.71	2574±68.22
Black tail white switch	45	64.29	2621±72.60

*Means bearing different superscripts differ significantly ($P < 0.05$)

The mean milk yields of buffaloes with long and short fore udder shape were 2775 and 2074.18, kg respectively which was significantly higher milk yield produced by buffaloes with long fore udder. The milk yield of buffaloes with high rear attachment was significantly higher than the buffaloes with low rear attachment. More than half of the animals were having high rear udder attachment and fewer animals were having the low rear udder attachment. The milk yield was significantly higher in animals with high rear attachment than low rear attachment and the present study was in agreement with Sonawande *et al.* (2002) who stated that large sized fore and rear udders, cylindrical teats and rounded teat tips in majority of Murrah buffaloes. Hafeez and Naidu (1981) reported that milk yield was significantly related with high rear attachment of udder.

The mean milk yields of buffaloes with round and pointed teat tips were 2597 and 2644 kg, respectively. No significant difference in milk yield was observed with type of teat tips. The mean milk yields of buffaloes with cylindrical and bottle teat shape were 2648 and 2530 kg, respectively. The present study suggested that majority of buffaloes were having the cylindrical teats and the milk yield was significantly higher in the buffaloes having cylindrical teats than bottle shaped teats. Funnel shaped teats were not observed in the present experimental animals. The study was in agreement with Saxena (1973) who found that in buffaloes the frequency of cylindrical teats was maximum followed by bottle, funnel and pear shaped teats. The mean milk yields of buffaloes with black tail black switch, black tail white switch were 2574 and 2621 kg, respectively. No significant difference was seen in milk yield with type of tail switch color. The study was not in agreement with Bhardwaj *et al.* (2007) who found that the milk yield was significantly higher in buffaloes having black tail with black switch than black tail with white switch.

Conclusion

It can be inferred from present study that flat head and wide brisket animals produced significantly more milk. Docile behavior of animals was found associated with high milk yield than aggressive and nervous animals. Murrah breed phenotypic characters viz. face type, teat tips, horn pattern and tail switch color has no influence on milk yield whereas character like deep udder, high rear attachment and cylindrical teat shape has significant influence on milk yield and may be used for selection of buffaloes.

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References

1. Bharadwaj, A., Dixit, V.B., Sethi, R.K. and Khanna, S. (2007). Association of breed characteristics with milk production in Murrah buffaloes. *Indian J. Ani. Sci.* 77: 1011-1016.



2. Bharadwaj, A., Sastry, N.S.R. and Yadav, R.S. (1991). Effect of udder conformation and temperaments on milk yield and its composition in Murrah buffaloes. *Post Congress Proceedings, III World Buffalo Congress, Varanasi*, Vol. IV, P. 63.
3. Bhuiyan, M.M., Islam, M.R., Ali, M.L., Hossain, M.K., Kadir, M.A., Lucky N.S. and Das, B.R. (2004). Importance of mammary system conformation traits in selecting dairy cows on milk yield in Bangladesh. *J. Bio. Sci.* 4: 100-102.
4. Dash, P.C., Basu, S.B., Sharma, K.N.S. and Sharma, P.A. (1976). Milking behaviour of Murrah buffaloes. *Indian J. Dairy Sci.* 29: 41-45.
5. DNA (2012). *Daily News and Analysis*. India will produce 191 million tonnes of milk by 2020, reported on 27th August in a conference held at Bangalore, India.
6. FAO, (2008). *The State of Food and Agriculture*. Food and Agriculture Organisation of the United Nation, Rome. A
7. Gupta, S.C., Handa, M.C. and Sahoo, G. (1985). Dairy temperament of buffaloes in relation to their milking ability. *Indian J. Ani. Prod. Manag.* 1: 116-119.
8. Hafeez, A. and Naidu, K.N. (1981). Relation of udder size with milk yield in buffaloes. *Indian J. Dairy Sci.* 34: 45-48.
9. Kar, D., Varma, A.K., Chhikara, S.K., Singh, I. and Vinayak, A.K. (2014) To study the correlation between muzzle width over nasal septum, brisket width, rump width and skin thickness at neck region with milk production in lactating Murrah buffaloes. *In proceeding: XXI Annual convention of ISAPM and National Seminar*, held at AAU, Anand, January 28-30, 2014.
10. Saxena, H.K. (1973). Variation in shape and size of teats in Murrah buffaloes. *Indian Vet. J.* 50: 668-675.
11. Shrikhande, G.B. Kolte, A.Y. and Kolte, B.R. (1996). Phenotypic characters of Nagpuri (Berari) buffaloes. *Indian Vet. J.* 73: 1198-1199.
12. Singh, M. and Bhatnagar, D.S. (1977). Size and shape of udder and teats in Brown Swiss crossbred vis-a-vis zebu cows and buffaloes. *Indian Vet. J.* 54: 377-83.
13. Snedecor, G.W. and Cochran, W.G. (1994). *Statistical Methods*. 8th Edn. Oxford and IBH Publishing Co., New Delhi.
14. Sonawande, J.S., Karanjkar, P.L. and Karanjkar, L.M. (2002). Udder characterization of milk animals in Ambajogai tehsil. *Indian J. Ani. Research.* 36: 55-57.
15. Tilkı M, İnal S, Colak M and Garıp M (2005) Relationships between milk yield and udder measurements in Brown Swiss Cows *Türk Veterinerlik ve Hayvancılık Dergisi* 29: 75 – 81.

