IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 15, Issue 12 Ser. II (December 2022), PP 53-55
www.iosrjournals.org

Phenotypic characterization of Local and Murrah Buffalos of Eastern Terai of Nepal: a Survey

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Abstract:
This study was conducted with the objective to compare the phenotypic traits of Local and Murrah female buffaloes. All together 17 phenotypic traits; body length, heart girth, barrel girth, loin girth, height at wither, height at hip bone, barrel height, head length, ear length, horn length, horn distance, tail length, switch length, fore feet above knee, fore feet below knee, rear feet above hock and rear feet below hock were recorded during survey in 52 buffaloes (Local=33, Murrah=19). The phenotypic traits had shown significant variation between the breeds. Analysis revealed three traits especially; barrel girth, loin girth and height at wither (210.8±23.7, 235.9±13.9; 185.4±22.3, 200.1±20.5 and 130.3±18.1, 137.3±5.2), respectively had significant difference ($p < 0.05$) between the two breeds. However, few measuring traits like; heart girth, barrel height, horn length, horn distance, tail length and switch lengthwere higher in Local than in Murrah buffaloes and with some measuring traits like; body length, barrel girth, loin girth, height at wither, height at hip bone, head length, ear length, fore feet above knee, fore feet below knee, rear feet above hock and rear feet below hock were lower in Local than in Murrah buffaloes. In conclusion, the economic phenotypic measuring traits were higher in Murrah buffaloes. For more phenotypic traits validation, further studies with large homogenous sample size to be studied.

Key word: *Buffalo, Phenotype, Murrah, Local*

Date of Submission: 11-12-2022 Date of Acceptance: 26-12-2022

I. Introduction:

Phenotypic traits are the basic methods of selection to identify and document genetic diversity within and between distinct breeds. Phenotypic characterization is the prerequisite of all lesser known buffalo populations in order to provide overall picture of buffalo genetic diversity (FAO, 2012). The overall improvement (productive and reproductive performances) for the particular animal breed to utilize and implement is quite hard unless knowing these physical attributes in regards with geographic location, population size, animal husbandry management practices. Selection by recording a minimum number of phenotypic traits reduce the cost, labor and time. Particular body measuring traits; objectively could improve selection for growth by enabling the breeder to recognize early-maturing and late-maturing animals of different size (Brown et al., 1973; 1974). Trait like; height at withers is a prime indicator used by FAO for type of breed (Simon and Buchenauer, 1993). Body shapes measuring had shown significant differences in different body measurement/biometric traits due to age and sex were reported by many workers in different breeds and species. i.e. Singh et al. (2008) and Yakubu et al. (2009) in cattle; Shahin et al. (1993) in Egyptian buffalo; Miserani et al. (2002) and Sadak et al. (2006) in horses; and Sarako et al. (2006) in sheep. The present study was conducted with the objectives to compare phenotypic traits in two breeds (Local and Murrah) and to find if any significant different traits.

Objective: To compare phenotypic traits of Local and Murrah buffalo of Eastern Terai of Nepal.

II. Methodology:

A questionnaire based survey was used to collected data from two different village; Badagama and Portaha of Saptari district of Eastern Tarai. All together 52 buffaloes (Local = 33, Murrah = 19) were measured carefully by own self with the help of a measuring tape for phenotypic traits.

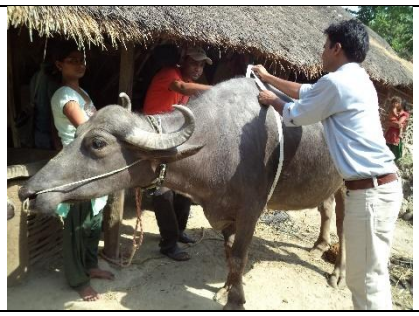
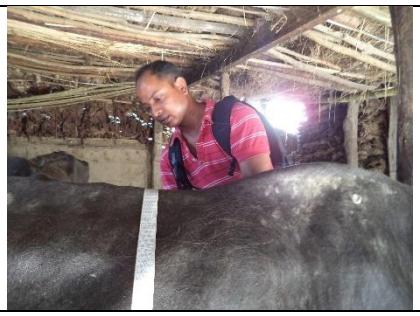

Fig. Photographic view of field work

Statistical analysis:
The data were analyzed using SPSS (20 Version) statistical software package. Independent sample t-test was used to compare means. Significance was assigned at $p<0.05$.

Table 1: Phenotypic parameters of Buffalo (mean±SD)

Phenotypic Parameters (cm)	Buffalo Breeds	
	Local (n=33)	Murrah (n=19)
Body length	132.0±11.0	134.1±8.5
Heart girth	185.1±23.9	183.6±40.1
Barrel girth	210.8±23.7*	235.9±13.9*
Loin girth	185.4±22.3*	200.1±20.5*
Height at wither	130.3±18.1*	137.3±5.2*
Height at hip bone	127.2±8.5	128.2±5.1
Barrel height	53.1±5.0	51.7±3.8
Head length	52.7±8.0	55.7±3.6
Ear length	27.5±3.3	28.3±2.5
Horn length	41.1±9.5	37.8±9.4
Horn distance	31.1±4.6	31.0±7.8
Tail length	75.3±12.0	72.9±11.0
Switch length	23.0±5.6	22.6±7.1
Fore feet above knee	41.6±4.0	46.1±6.4
Fore feet below knee	31.5±3.8	32.1±2.1
Rear feet above hock	42.5±5.7	43.3±8.0
Rear feet below hock	46.8±4.8	47.7±2.2

*Indicates significant difference ($p < 0.05$) within rows

III. Results and Discussions:

The phenotypic traits of buffalos were presented in Table 1. The phenotypic traits had shown significant variation between the breeds. Analysis revealed three traits especially; barrel girth, loin girth and height at wither (210.8±23.7, 235.9±13.9; 185.4±22.3, 200.1±20.5 and 130.3±18.1, 137.3±5.2), respectively had significant difference ($p < 0.05$) between the two breeds. Height at wither had shown to be significant difference which is a prime indicator to differentiate the type of breed which was in accordance with FAO recommendation (Simon and Buchenauer, 1993). However, few measuring traits like; heart girth (185.1±23.9, 183.6±40.1), barrel height (53.1±5.0, 53.1±5.0), horn length (41.1±9.5, 37.8±9.4), horn distance (31.1±4.6, 31.0±7.8), tail length (75.3±12.0, 72.9±11.0) and switch length(23.0±5.6, 22.6±7.1), respectively were higher in Local than in Murrah buffaloes. While some measuring traits like; body length (132.0±11.0, 134.1±8.5), height at hip bone (127.2±8.5, 128.2±5.1), head length (52.7±8.0, 55.7±3.6), ear length (27.5±3.3, 28.3±2.5), fore feet above knee (41.6±4.0, 46.1±6.4), fore feet below knee (31.5±3.8, 32.1±2.1), rear feet above hock (42.5±5.7, 43.3±8.0) and rear feet below hock (46.8±4.8, 47.7±2.2), respectively were lower in Local than in Murrah buffaloes. The

finding of Siddiquee et al. (2010), Khan et al. (2013), Zahariev et al. (1986) and Hasnath, 1985 were partially similar with the present study.

IV. Conclusions and Recommendations:

The economic phenotypic measuring traits were higher in Murrah buffaloes. Three measuring traits especially; barrel girth, loin girth and height at wither were higher in Murrah than in Local buffaloes. For more phenotypic traits validation, further studies with large homogenous sample size to be studied.

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Md. Shahanavaz Ali, et. al. "Phenotypic characterization of Local and Murrah Buffalos of Eastern Terai of Nepal: a Survey." *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)*, 15(12), 2022, pp. 53-55.