



## Farmers' perception about importance of phenotypic characters in pricing of a buffalo

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India has over 111.3 million buffaloes constituting about 57.3% of the world population. Though less in population as compared to cattle (199.08 million), buffaloes currently produce 62.35 million tonne of milk, which is 51.2% of the total milk produced in the country (FAO 2012). Besides milk, 1.525 million tonne of meat is also produced from buffaloes. Buffalo draught power accounts for about 10% of the total draught power contributed by the work animals in the country. In addition to milk, meat and draught, buffaloes also produce 0.52 million tonne of skin and hides in the country.

Singh and Singh (2006) reported large scale exodus of buffaloes from Haryana through sale of buffaloes. Headlines of buffaloes fetching over ₹ 5 lakh are not uncommon. But how the farmers decide the price of buffaloes needs to be studied scientifically. It is often heard from the farmers that phenotypic characters like horns, udder, body colour etc. are very important in deciding the price of a buffalo. Therefore, it became imperative to study the perceptions of farmers about contribution of the most important phenotypic characters in deciding the price of a buffalo.

The study was undertaken in the Murrah breeding tract of Haryana constituting 4 districts, viz. Rohtak, Hisar, Jind and Bhiwani, as maximum buffaloes were sold to other states from these districts. Buffalo traders (100) located in the districts were asked to identify the villages from where maximum sale of buffaloes took place. Thus, finally on the basis of frequency of responses of these traders, 4 villages from each selected district were identified. Thus, Kungarh, Singhwa, Ghudan and Deshkhara villages from Bhiwani, Hisar, Rohtak and Jind districts were identified, respectively. Farmers of these villages were further distributed into 3 categories, selling 1–2 animals, 3–5 animals and more than 5 animals in the last 5 years. Proportional random sampling was done to have a sample of 30 farmers from each village. Thus 120 respondents constituted the study sample (category 1). Similarly, 4 villages Lohari Jattu, Bado Patti, Dobh and Rajpura Dobhi were also identified from where comparatively less sale of buffaloes took place and a

matching sample of 120 farmers of similar categories was selected (category 2). Thus the study constituted 240 farmers of 8 villages of 4 districts.

*Identification of characters:* To find out characters which determine the price of a buffalo, a list was prepared on the basis of the review of literature, discussion with animal scientists and farmers. An effort was made to make this list comprehensive and complete. After thorough discussions 18 characters were identified which determine the price of a buffalo. These characters were administered to farmers. The responses were elicited on a 5 point continuum from most important to 'least important'. Thus the mean score of farmers on 18 characters was calculated and rank of each parameter was determined.

Data were also collected on the income earned through sale of buffaloes in the last 5 years in the 2 categories of villages (Table 1). About 53% of the respondents earned more than ₹ 1 lakh through sale of buffaloes in category 1 villages while 36% respondents earned this amount in category 2 villages. Only 11.67% respondents earned less than ₹ 50,000 from category 1 villages whereas this proportion was sizeable (39.17%) in category 2) villages. Thus, farmers earned additional income through sale of buffaloes in Haryana.

Data were collected from 240 farmers on 18 characters on five point continuum from 'most important' to 'least important' which determined the price of a buffalo. Thus,

Table 1. Income from sale of buffaloes in last 5 years

Income	Villages from where maximum sale of buffaloes took place		Villages from where comparatively less sale of buffaloes took place	
	frequency	percentage	frequency	percentage
More than ₹ 3 lakh	31	25.83	23	19.17
₹ 1-3 lakh	32	26.67	13	10.83
₹ 50,000–100,000	43	35.83	37	30.83
Less than ₹ 50,000	14	11.67	47	39.17

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Table 2. Perception of farmers regarding characteristics of buffaloes which determine their price

Character	Villages from where maximum sale of buffaloes	Villages from where comparatively less sale of buffaloes
	took place (mean score)	took place (mean score)
Milk yield	4.96	4.84
Parity (no. of lactation)	4.42	4.06
Stage of lactation	4.26	3.62
Shape and size of udder	4.32	4.14
Attachment of udder	4.16	3.86
Length of teats	3.41	3.44
Shape of teats	2.92	3.32
Placement of teats	3.52	3.27
Prominence of milk vein	3.08	3.56
Height / body size	3.64	3.80
Color of animal	4.46	3.74
Horn pattern	4.58	3.84
Shape of face / fore head	2.26	3.18
White markings on forehead	3.44	3.01
Tail switch	2.46	3.05
Skin thickness	2.40	2.94
Sex of calf	2.81	2.90
Temperament	2.16	3.12

Rho= 0.87.

Table 3. Contribution of morphological characters for pricing of a buffalo

Model	Variable/variable set	P-value	R-square
6-characters	Milk yield + color + parity + stage of lactation +horne+shape and size of udder	1.60E-14	0.88
5-characters	Milk yield + color + parity + stage of lactation +horne	1.13E-13	0.86
4-characters	Milk yield + color + parity + stage of lactation	2.8E-10	0.80
3-characters	Milk yield + color + parity	3.61E-08	0.75
2-characters	Milk yield + color	5.03E-05	0.67
Single character	Milk yield (1-var.)	0.12	0.45

on the basis of their responses mean scores of 120 farmers (each from category 1 and 2) on 18 characters were calculated and are presented in Table 2. In determining the price of a buffalo, milk yield (4.96), horn pattern (4.58) and parity (4.42) were considered the most important characters while sex of calf (2.81) and temperament (2.16) were perceived as the least important by the farmers of category 1 villages. Similarly, milk yield (4.84), shape and size of udder (4.14) and parity (4.06) were considered the most important while temperament (3.12) and sex of calf (2.90) were treated as the least important by the farmers of the category 2 villages. The findings supported scientifically established facts. Though, the data revealed that there was not much difference in mean perception of farmers in category 1 (4.96) and category 2 (4.84) villages regarding milk production. With regard to other characters also, similar trend was observed. While, maximum variation in the means of 2 categories of villages was observed in temperament category 1 (2.16) and category 2 (3.12). Farmers of category 2 villages found temperament more

important than category 1 villages. Though it did not figure at all in the list of important characters which were determined by regression analysis. Mondal and Pandey (1993) reported that milk yield and horns were important factors in deciding the price of a buffalo while Mondal and Pandey (1996) in another study mentioned that shape and size of udder were important factors while marketing buffaloes.

Spearman's Rank order correlation was applied to see if there was any association in the opinion of 2 categories of respondents. The rho-value was 0.87 which was significant at 0.01 % level of significance and indicated that there was similarity in the opinion of both the categories of respondents. The study was in line with the established marketing practices which suggested that buffaloes yielding 12 litre of milk in their first lactation fetched maximum price (Mondal and Pandey 1996). Similar findings were also reported by Singh and Singh (2006).

An attempt was made to understand through a survey that how farmers fix price of their buffaloes. To accomplish this objective 240 farmers selected for this study from 2 categories of villages were asked to mention price of their buffaloes on the basis of existing 18 phenotypic characters on 5 point continuum. Thus, taking into consideration, rating of each parameter on 5 point continuum, they were asked

to mention the price of their buffaloes. So, data of 240 respondents on 18 phenotypic characters along with the cost of buffaloes were collected through a survey by personally interacting with each farmer. Finally, 240 observations of farmers about phenotypic characters of buffaloes along with their price were collected. To find out the contribution of phenotypic characters to the price of buffaloes, stepwise forward regression was applied. Price of buffaloes was considered as dependent variable (y) while 18 phenotypic characters identified in this study were considered as independent variable (x), and findings of regression analysis are presented in Table 3.

Table 4. Marketing channels in sale of buffaloes

Type	Frequency	%
Farmer producer-final buyer	45	38.5
Farmer producer-trader-buyer	20	16.1
Farmer producer-agent-trader-buyer	30	25.0
Farmer producer-local trader-big trader buyer	25	20.4

Milk yield was the single most important parameter which contributed to the extent of 45% whereas, milk yield and dark color of animals contributed to the tune of 67% (Table 3). When another variable parity was added to these 2 variables the contribution became 75%. The contribution of variables further increased to 80% when another i.e. stage of lactation was added to the equation. This further increased to 86 and 88% when horns and shape and size of udder were added to the equation, respectively. Thus, buyers and sellers may examine these characters critically before deciding the price of a buffalo.

It was considered imperative to study the different marketing channels in the sale of buffaloes from the villages maximum sale of buffaloes took place (Table 4), 38.5% respondents sold their buffaloes directly to buyers. Similar findings were reported by Pandey (2007). While 16% respondents mentioned that they sold their buffaloes through traders. The study further indicated that ¼ of the respondents sold their buffaloes through agents and traders. The remaining 30% respondents said that they first of all sold their buffaloes to local traders from whom big traders purchased and then it was sold to final buyers. Thus, 4 types of different channels were observed in the sale of buffaloes. Ubale (2015) also identified 6 marketing channels in trading of cattle. Thus, different channels were used by the farmers to sell their buffaloes.

#### SUMMARY

The study was conducted in Haryana and the response of 240 farmers was elicited on 18 phenotypic characters regarding their perception about the importance of these

characters in fixing the price of a buffalo. On the basis of their mean scores, ranks were calculated in both the categories of villages. The study revealed that milk yield (4.96), parity (4.42) and stage of lactation were considered the most important in (category 1) villages while milk yield (4.84), shape and size of udder (4.14) and parity (4.06) were perceived as the most important in category 2 villages in determining the price of a buffalo. Rho-value of 0.87 indicated that there was association in their responses regarding the role of phenotypic characters in determining their price. Results pertaining to stepwise-forward regression indicated that 6 phenotypic characters contributed to the extent of 88% in deciding the price of a buffalo.

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