Indian Journal of Animal Sciences **81** (11): 1189–1190, November 2011

Factors affecting market price of cattle and buffalo in Odisha*

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Received: 29 April 2010; Accepted: 22 May 2011

Key words: Buffalo, Cattle, Marketing, Odisha, Price

The economy of rural Odisha, primarily based on agriculture and animal husbandry is closely associated with agriculture. Crop and livestock enterprise form 2 functional components of mixed farming in rural Odisha. Odisha possesses 20.47 million cattle and 1.79 million buffaloes (18th livestock census, department of AHD&F, GOI) and hundreds of thousands of animals are transacted every year through livestock markets. Present study was undertaken with the objective to ascertain the factors (both qualitative and quantitative) that affect the price of the female animals in the market.

The multistage stratified random sampling scheme was followed in the present study. Odisha was classified into 3 agro-climatic regions, viz. Coastal, Southern/KBK (Koraput, Balangir and Kalahandi) and Northern regions. Considering each agro-climatic region as a stratum, 2 districts from each stratum were selected randomly. So Dhenkanal and Ganjam districts from coastal region, Koraput and Kalahandi district from Southern/KBK region and Keonjhar and Mayurbhanj from Northern region were selected randomly. From each selected district 2 livestock markets were selected randomly. The last stages of sampling involved selection of the respondents from the selected markets. Present study constituted 2 types of respondents, viz. farmer/ livestock producer and market functionaries. Eight livestock producers who had come to the market for selling of large ruminants and 3 market functionaries (middle men, itinerate traders, commission agents etc.) from the selected market were selected randomly, which constituted 96 sample of livestock producer and 36 market functionaries.

For collection of primary data from sample respondents, an interview schedule was specially structured and pretested and the data were collected through personal survey method during the period from January to April 2009. On the whole, 56 cattle and buffalo were transected among the farmers and buyers during the study period. To asses precisely the extent to which quantitative and qualitative factors determined prices of the female animal, multiple regression analysis was carried out. Initially zero order correlation coefficients amongst price of the animal and quantitative factors were obtained which indicated the degree of association of independent variables with dependent variable and multicollinearity could also be detected from these coefficients. Scatter diagram was initially drawn for the quantitative factors so as to establish their relationship with the price of the animal. Impact of various qualitative factors was captured by incorporating dummy variables as well as using standard scores. For general appearance, temperament, size of teat and attachment of udder, standard score were used. The seller and buyers were asked to put score out of 100 for a particular attribute, which were afterwards converted into standard scores for use in the regression model.

Initially, the explanatory variables considered for studying the variations in market price of female cattle and buffaloes were: breed, age, order of lactation, productivity, general appearance, temperament, lactating/non-lactating, size of teats, and attachment of udder and reason of sale. Based on zero order correlation matrixes, age and order of lactation were found to be highly correlated. So order of lactation was dropped to avoid multicollinearity problem retaining age. At last, the following model was selected:

$$Y_i=b_o+b_1X_{1i}+b_2X_{2i}+b_3X_{3i}+b_4X_{4i}+b_5X_{5i}+b_6X_{6i}+b_7X_{7i}+b_8X_{8i}+b_9X_{9i}+e_i$$

where, Y_i, dependant variable (market price of i^{th} female cattle and buffalo (₹); b_o, constant term; b_j's, regression coefficients associated with j^{th} variable (X_j) (j,1,2,….8);X_{1i}, general appearance in terms of standard score of i^{th} female cattle and buffalo;X_{2i}, temperament in terms of standard score of i^{th} female cattle and buffalo;X_{3i}, size of teat in terms of standard score of i^{th} female cattle and buffalo;X_{4i}, attachment of udder in term of standard score of i^{th} female cattle and buffalo; X_{5i}, dummy variable for breed (base, non-descript local) with a value "1" for CB animals and "2" otherwise of i^{th} female cattle

* M.V.Sc. thesis submitted to IVRI by the first author

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and buffalo;X_{6i}, dummy variable for reason of sale (base, urgent financial need) with a value "1" for replacement and "2" otherwise of i^{th} female cattle and buffalo; X_{7i},age of i^{th} female cattle and buffalo in years; X_{8i}, productivity of i^{th} female cattle and buffalo in liters per day; and e_i, random error term associated with Y_i assumed to follow normal distribution with zero mean and constant variance.

The multiple linear regression equation, which is fitted for factors affecting market price of female cattle and buffaloes was significant (F value, –47.90) with the adjusted R^2 value of 0.88. This indicates that 88% of the variation in the dependant variable was explained by the explanatory variables included in the equation. To ascertain the net impact of breed, dummy variable was used. It is observed that the regression coefficient of dummy variable turned out to be positive and significant, thereby indicating that crossbred cows have a price premium of ₹1443.04 over that of local breed. Pandit *et al.* (2004) have also found that crossbred cows fetched significantly higher price than local cows and in agreement with the present finding.

Temperament has positive coefficient and also it has the significant effect on market price. As net effect of temperament was measured by using standard scores, it can be said that a cow with higher score has price premium over a cow with lower score i.e. an aggressive and unmanageable animal fetches less price than a docile animal. It can be concluded that the price of the animal will increase by ₹810.92 for 1% increase in standard score of temperament.

To determine the net effect of general appearance, standard score was used. It was found that the regression coefficient for general appearance was negative but nonsignificant indicating that the cattle and buffalo having less score fetches less than an animal having higher score. Pandit *et al.* (2004) have also found that a cow having higher score on general appearance fetched more than that having less score.

The regression coefficient of size of teat was positive but statistically not significant indicating that the cattle and buffalo having 1% higher score on teat size has a price premium of ₹31.05 over an animal having lesser score on teat size. Regression coefficient of attachment of udder was negative but nonsignificant. The regression coefficient indicated that buyers paid much attention to attachment of udder and size of teat while purchasing female cattle and buffalo.

The regression coefficient of reason of sale was found negative and statistically significant indicating that farmers may get less price while selling animals for urgent financial requirement than for other purpose. Regression coefficient of dry animals was negative but nonsignificant indicating that dry cows fetch ₹254.61 less than lactating cows.

The regression coefficient of age of cattle and buffalo was found negative and statistically insignificant indicating that the animal fetches ₹24.64 less as its age increases by one year. Regression coefficient of productivity of cattle and buffalo was found positive and statistically significant indicating that high yielder fetches more price than the low yielder. It can be inferred that increase in one liter of milk production increases the market price of the animal by ₹2330.82.

It is revealed form the analysis that milk yield, breed, temperament and reason of sale have significant effect on market price of the female cattle and buffaloes. The result of the analysis has shown that crossbred animal has significantly higher price than non-descript animals. Hence, the farmers could be encouraged to adopt crossbreeding programme. It has also been seen from the analysis that lactating animals fetch higher price than dry animals indicating that farmers should sell their animals while they are in lactation. Also it is seen from the result that farmers get less price while selling animals for urgent financial requirement than for other purpose.

SUMMARY

An investigation on factors associated with the market price of cattle and buffalo transacted in 12 markets of 6 districts of Odisha has been done during 2009. It has been found that milk yield, breed, temperament and reason of sale are the most significant contributory factors for price variation in female cattle and buffaloes. Cattle and buffaloes sold for meeting the urgent financial needs of the owner had lower market prices than the normal price. The study suggests the farmers to upgrade their indigenous cattle and buffaloes by adopting crossbreeding technology to get higher price.

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