

FARMERS' KNOWLEDGE ON PRODUCTIVE AND REPRODUCTIVE PERFORMANCES OF BUFFALO UNDER SMALLHOLDER FARMING SYSTEM

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ABSTRACT

Dairying farming can be cost effective when the animals rearing were directly influenced by the productive and reproductive parameters of buffalo. Productive and reproductive performances of dairy animals should be determined on the basis of average daily milk yield, lactation length, lactation milk yield, peak yield, dry period, service period, conception rate, pregnancy rate, calving interval etc. These parameters should be maintained by the farmers so that the productivity could be increased of their herd. Hence, the study was conducted to measure the productive and reproductive performances of buffalo and dairy animal and Farmers' knowledge on these aspect in Faizabad district of Uttar Pradesh. For this purpose 150 farmers engaged in dairying were interviewed. The farmer was selected on the basis of at least completion of one lactation length of buffalo at the time of investigation and each farmer must be rearing a buffalo in combination with crossbred cow and indigenous cow at the time of investigation.

The overall Average daily milk yield (ADMY) and Lactation length (LL) was estimated to be 5.75 ± 0.65 litre/day/animal and 276 ± 14 days/animal. The average peak yield of buffalo in the field condition was estimated to be 8.56 ± 0.85 litre/animals while Age at first calving (AFC) was 1288 ± 122 days/ animals respectively. The study reveals that the 41.00 percent of respondent were

having high level of knowledge about productive and reproductive practices. Whilst about 30.00 percent of respondent were having medium level of knowledge. Knowledge index on productive and reproductive parameters of dairy animal was calculated and observed that respondent were possessing 73.47 and 70.21 percent knowledge in study area. Though the respondent are facing serious constraint in rearing, they were frequently updating their knowledge on productive and reproductive practices as compared to Buffalo and indigenous cow based dairy farmers.

Keywords: buffalo, dairying, farmers' knowledge, india, productive and reproductive performance

INTRODUCTION

Dairying sector is focussing to plays a unique multi-faceted role in socio-economic development of rural households and contributes about 3.88 percent to the Gross Domestic Product and 21.58 percent to the Agricultural Gross Domestic Product in India (Annual Report, 2014-15). The 51% share of total milk production of 127.8 million tonnes (2011-12) was dominated by 105.3 million buffaloes accounting for about 51 percent of Asia's and about 19 percent of world's bovine population. The current market trend in livestock sector growth suggests that in

order to meet the emerging demand for livestock based products basically milk, both in domestic and global markets, there is a need to reorient the production system by enhancing the efficiency and creating quality consciousness. India ranks first in milk production which is produced by its huge bovine population (304.5 million) and little contribution from other species (Annual Report, 2014-15). But the major concerns that is troubling farmers is the low productivity per animal. Basically milk production (productivity) depends on four dimensions of animal husbandry practices i.e. breeding, feeding, health-care and management practices.

Productive and Reproductive efficiency are important parameters, which influences the economics of milk production considerably. There are a large number of productive and reproductive problem in the field condition which render the animal with losses of reproductive function. Any impairment in normal reproductive function results into infertility or sterility of animal, leading to economic losses due to widening of dry period and inter calving interval, reducing calving and lactation during lifetime of animal (Agarwal *et al.*, 2005). About 18-40 percent of cattle and buffalo are culled and reach to abattoir mostly due to infertility (Sharma *et al.*, 1993). Total losses due to reproductive problems in buffaloes were 39 percent of all the losses incurred by various disease conditions (Khan *et al.*, 1995). Production and Reproduction are one of the most important considerations to determine the profitability of cattle and buffalo. Productive and reproductive performances of dairy animals should be determined on the basis of these parameters. Keeping in view these problem the following study was undertaken to find out the Productive and reproductive performance of buffaloes animals

managed by farmers and to assess the knowledge of farmers on these parameters.

MATERIAL AND METHOD

The present study was purposively undertaken in the state of Uttar Pradesh, which is one of the largest state occupying first position in milk production with 23.00 percent of total buffaloes (26.44 million), producing 20.10 million tonnes of milk. Faizabad district from Uttar Pradesh was selected purposively as the buffalo population was fairly distributed in the region.

The region is not highly productive, small farmers are heavily dependent on different species of livestock for their livelihood. From the present study area six villages were selected randomly from three randomly selected blocks. The information for this study was collected from 150 farmers, 25 from each selected village. The farmer was selected on the basis of at least completion of one lactation length of buffalo at the time of investigation. The criteria for the selection of respondents was that each farmer must be rearing a buffalo in combination with crossbred cow and indigenous cow at the time of investigation. Finally, the respondents were grouped in three different dairy farming system i.e. Buffalo based farmers, Crossbreed farmers and Indigenous based farmer based on the criteria that maximum number of farmers are rearing the particular livestock. The primary data was collected by personal interview method using a structured interview schedule. The respondents were interviewed, individually and the data about animal performance and knowledge of the respondents was collected. The collected data were tabulated, scored and analyzed in the light of the set objectives.

Knowledge of farmers on productive and reproductive parameters of buffalo

English and English (1961) defined knowledge as a body of understood information possessed by an individual. Knowledge in the present study refers to which information and understanding, the respondent has about the improved dairy breeding and management practices (Productive and reproductive traits of dairy animals). A knowledge test was developed and standardized by following the procedure described by Linnquist (1951). The farmers were exposed to the test and knowledge score was obtained depending on Farmers' recall memory. All possible care was taken to cover maximum aspect pertaining Productive and reproductive performances of dairy of animal. The respondents were classified in terms of having low, medium and high knowledge level on the basis of cumulative square root frequency method.

Knowledge index

The knowledge index was measured by using following formula

RESULTS AND DISCUSSION

Productive and reproductive performances of buffaloes in dairying farming system

The current status of the production of buffalo was ascertained with respect to various production and reproduction traits considered under study were analysed and presented in the following sub-heads:

Average Daily Milk Yield (ADMY)

Average milk yield of buffalo is an important productive indicator showing average

daily milk yield of upgraded buffalo in field which were reared in combination with other animals. It refers to average milk yield of buffalo during the lactation period of 305 days measured in liters/day. The result in table-1 shows that the ADMY of buffalo based farmers, cross breed based and indigenous based farmers was 6.01 ± 0.5 , 5.79 ± 0.56 , and 5.45 ± 0.61 litre/day/animal respectively. The overall ADMY was estimated to be 5.75 ± 0.65 litre/day/animal. The high ADMY of buffalo was due to the fact that buffalo are actually treated as milk animal and due care was taken in feeding and management of these animals.

Lactation Length (LL)

The optimum lactation length of dairy animals is one of the best productive indicator of dairy animals. LL is number of days a buffalo remain in milk from the date of calving to the date of dry. The data pertaining to present investigation the lactation length of Buffalo in different system was 281 ± 19 , 277 ± 16 , and 276 ± 14 days/animal respectively. The overall LL of the buffalo in the area was 276 ± 14 days/ animal. Murrah buffalo lactation length in the west Godavari was reported to be 299.91 ± 5.01 which is quite similar to the above data (Suresh, 2013). LL was mainly influenced by the parity of lactation. Singh *et al.* (2011) has shown the positively correlation between the parity of lactation and lactation length in Nilli-Ravi buffaloes.

Lactation Milk Yield (LMY)

The lactation milk yield of the dairy animals has positive relation with the overall performances of an animal. It is conceptualized as the average total quantity of milk produced by an animal in its lactation period of 200 days. A cursory look on Table 1 reveal that the LMY of Buffalo reared in

the buffalo based farming was highest. It shows that the LMY was 1733.03 ± 189 , 1694.44 ± 124 , and 1487.33 ± 117 litre/animal respectively. Hitesh *et al.*, (2012) reported that 305 day milk yield in Murrah Buffalo was 2147.6 ± 87.06 kg The author observed these results because buffaloes been the major milk producer and due care was taken in feeding and management of the animals.

Peak Yield (PY)

Peak yield is measured as the highest milk produced by the milch animal in its lactation length. The data present in Table 1 reveals that the average peak milk yield of Buffalo was highest in buffalo based farming system (8.87 ± 0.98) followed by indigenous based (8.12 ± 0.79) and cross breed (8.64 ± 0.85) based farming. The average peak yield of buffalo in the field condition was estimated to be 8.56 ± 0.85 litre/animals respectively. Suresh (2013) stated that the overall peak milk yield of Buffalo was recorded as 13.97 ± 1.13 .

Dry Period (DP)

It refers to the number of days a cow remained dry i.e. the interval between the dates of dry to the date of next calving. It was observed from the table-1 that the dry period of Buffalo was 211 ± 12 , 230 ± 14 and 237 ± 16 days/animal. The average DP calculated was observed to be 226 ± 13 days/animal respectively. Similar finding were also observed by Thiruvankadan *et al.* (2010) and stated that the dry period of 250.5 ± 15.9 days in buffaloes. However Yadav *et al.* (2007) stated the lower dry period in the Murrah buffaloes maintained in its home tract.

Age At First Calving (AFC)

Late maturity and age at first calving are one of the most important reasons to losses

the performances of dairy animals lower the age of first calving better the performances of dairy animals. AFC is the actual age of animals in days at the time of its first calving for buffaloes. Buffalo reared under different system the age at first calving was observed to be highest in the indigenous pattern (1308 ± 108) followed by cross breed animals (1294 ± 123) and least was observed in buffalo rearing system (1260 ± 112) days/ animal respectively.

The overall AFC of buffalo in the area was stated as 1288 ± 122 days/ animals respectively. The study conducted by Bohra *et al.* (2007) in Uttarakhand state found that the AFC in buffalo was about 4.6 years. In general, AFC in Indian dairy animal is much higher compared to their exotic or crossbred counterparts which is largely attributed to lack of selection for their traits from generation to generation. The Reduction in the age at first calving leads to an increase in lactation yield and helps in improving the economy of dairy farmers. Shashidhara *et al.* (1998) stated that age at first calving of 1301-1390 days was optimum for getting maximum lactation milk yield and lifetime milk yield in buffaloes which shows that the farmers were having ideal management of buffaloes.

Service Period

The data pertaining to service period was presented in the Table 1 and found that the service period of Buffalo was 189 ± 15 , 198 ± 17 and 199 ± 18 days/animal respectively. The average service period of 139.91 ± 2.96 days was reported in Murrah buffalo at NDRI farm (Jamuna *et al.*, 2013). The important cause of long service period as many heat period are lost due to unavailability of breeding bulls or artificial insemination in the area. Abayawansa *et al.* (2011) also stated that poor detection of oestrus caused by low attention

on buffalo with first parity as they produce low milk could be one of reasons to have comparatively longer intervals.

Service Per Conception

It is defined as an average number of insemination or natural service required by buffalo to become pregnant. It was observed that the service per conception of buffalo was highest in buffalo based farming (1.84 ± 0.52). Service per conception of buffalo in other system was 1.78 ± 0.32 and 1.76 ± 0.42 times/animal respectively. It was observed the farmers were attaining appropriate

conception rate in field condition which might reflect their sound knowledge in reproductive aspect of buffalo or due to good management provided by them. Khan *et al.* (2009) observed service per conception of about 2 in Murrah buffalo at organized farm. Higher rate of service per conception may be due to un-identification of heat, post partum complication in the buffalo and may also indicative of poor postpartum management.

Calving Interval

Calving interval (CI) is another important parameter for performances of the dairy animals

Table 1. Productive and reproductive performances of the Buffalo.

S. No.	Parameters	Buffalo Based farmers (Buffalo = 109)	Cross breed based farmers (Buffalo = 45)	Indigenous cow based farmers (Buffalo = 33)	Overall performance (Buffalo = 187)
Productive parameters					
1	Average daily milk yield (l)	6.01 \pm 0.5	5.79 \pm 0.56	5.45 \pm 0.61	5.75 \pm 0.65
2	Lactation Length (Days)	281 \pm 19	277 \pm 16	276 \pm 14	276 \pm 14
3	Lactation milk yield (l)	1733.03 \pm 189	1694.44 \pm 124	1487.33 \pm 117	1587.60 \pm 113
4	Peak yield (l)	8.87 \pm 0.98	8.12 \pm 0.79	8.64 \pm 0.85	8.56 \pm 0.85
5	Dry period (Days)	211 \pm 12	230 \pm 14	237 \pm 16	226 \pm 13
Reproductive parameters					
6	Age at first calving (Days)	1260 \pm 112	1294 \pm 123	1308 \pm 108	1288 \pm 122
7	Service period (Days)	189 \pm 15	198 \pm 17	199 \pm 18	189 \pm 16
8	Service per Conception (no.)	1.84 \pm 0.52	1.78 \pm 0.32	1.76 \pm 0.42	1.76 \pm 0.72
9	Calving interval (Days)	495 \pm 45	508 \pm 47	513 \pm 38	505 \pm 39

Table 2. Distribution of farmers based on knowledge on Productive and reproductive practice.

n=150

S. No.	Respondents	Categories	Frequency	Percentage
1	Knowledge on productive parameters	Low (<17.8)	43	28.67
	Range (13-25),	Medium (17.8-21.78)	45	30.00
	Mean (20.35)	High (>21.78)	62	41.33
2	Knowledge on Reproductive parameters	Low (<27.96)	41	27.33
	Range (22-39),	Medium (27.96-33.60)	60	40.00
	Mean (31.66)	High (>33.45)	49	32.67
3	Knowledge on productive and Reproductive parameters	Low (<45.4)	37	24.67
	Range (37-62),	Medium (45.4-55.4)	58	38.62
	Mean (52.07)	High (>55.4)	55	36.55

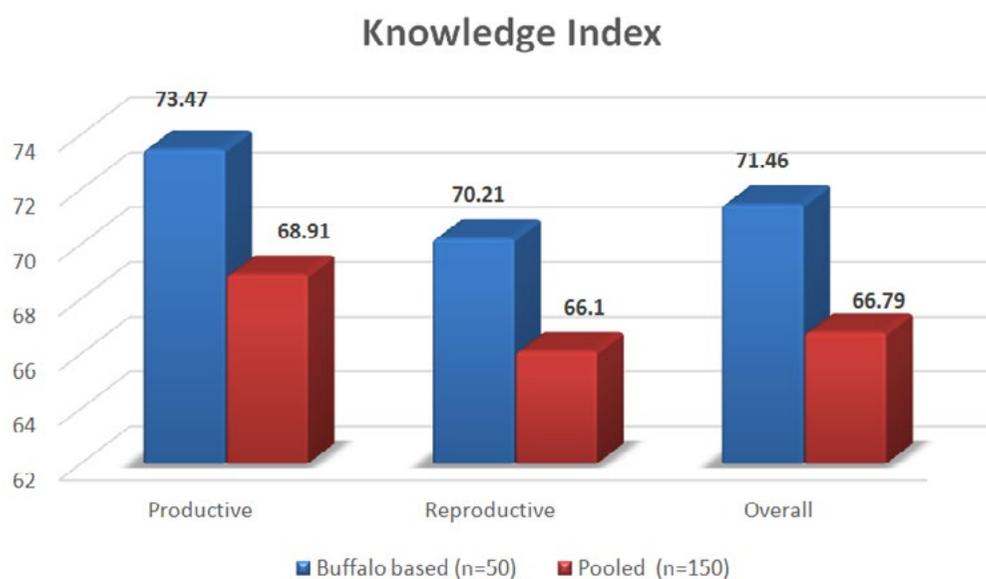


Figure 1. Knowledge index of farmers on productive and reproductive parameters.

keeping in the mind the data was properly analyzed and state that 495 ± 45 , 508 ± 47 and 513 ± 38 days/animals respectively. It was concluded that calving interval of buffalo was 505 ± 39 days/animal respectively. The lower calving interval of the buffalo was due to the care taken by the farmers in their feeding and maintaining the dry period. While the study of Thiruvankadan *et al.* (2010) reports the higher calving interval of 559.6 ± 17.3 days in buffaloes.

Knowledge of Dairy Farmers on Productive and Reproductive parameters of Buffaloes

Knowledge is a body of understood information possessed by an individuals. Therefore the knowledge possessed by individual regarding the productive and reproductive practices of buffalo had impact on the profitability of farmers. Farmer's rate of adoption was greatly influenced by the gain in knowledge. Hence an attempt has been made to study the knowledge of farmers in relation to Productive and reproductive practices of buffalo.

The finding presented in Table 2 reveals that about 41.00 percent of respondent were having high level of knowledge on productive practices of dairy animals. Whilst about 30.00 percent of respondent were having medium level of knowledge and almost 28.67 percent respondent were possessed low level of knowledge. Thus it could be concluded that respondent in the study area were having high to medium level of knowledge in productive practices of dairy animals. It is also reveals that the 40.00 percent of respondent were having medium level of knowledge on reproductive parameters of dairy animals. Whilst about 32.67 and 27.00 percent of respondent were having high and low level of knowledge on the reproductive practices of dairy animals. The study of Subhash *et al.* (2013) also

reveals similar finding that the farmers were having highest knowledge about reproductive disorders like abortion followed by Repeat breeding, anoestrus, late maturity and retention of placenta. He also concluded that nearly 65.41 percent of respondent was considered as good knowledge on reproductive disorders of dairy animals.

Knowledge Index of Farmers on Productive and Reproductive Practices of Buffalo was calculated. The collected data was further analysed and the resulted presented in Figure 1 reveals that the overall knowledge possessed by farmers was 66.79 percent in the study area. It was further observed that those respondents were having good knowledge (68.91%) on productive practices as compared to reproductive practices (66.10%). It was also noticed that buffalo based farmers were having knowledge up to the extent of 73.47 and 70.21 percent on productive and reproductive practices of dairy animals.

The study finely concluded that majority of the farmers were having healthy knowledge about performance on productive and reproductive practices of buffalo. The buffalo based farmers were having more knowledge on productive (73.47%) and reproductive (70.21%) parameters than their counterparts. So it can be concluded from the above discussion that the performance of productive practices is comparatively better than the reproductive practices due to the more knowledge on productive practice and low knowledge on reproductive practice of farmer.

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