

Effect of Mineral Supplement and Balance Concentrate Mixture on Milk Production and Reproduction Traits of Buffaloes under Rural Management Practices

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Abstract

An on-farm testing was conducted to assess the effect of mineral supplementation and balance concentrate mixture on production and reproduction traits of buffaloes under rural management practices. Buffaloes were categorized in to three groups, each group having five buffaloes. First group of buffaloes were taken as control group (buffalo owners practice) (T_1). The second group of buffaloes were fed balance concentrate mixture according to milk production @ 1 kg/2.5 litre milk/day (T_2) and third group were fed balance concentrate mixture according to milk production @ 1 kg/ 2.5 litre milk/day + 60 g mineral mixture/day (T_3). Results of the trial reveal that overall milk production recorded were 7.67, 8.57 and 9.57 litre/day for treatment T_1 , T_2 and T_3 ; respectively. Treatment T_3 had significant effect on milk production in comparison to treatment buffalo owners practice as well as T_2 and increased 1.9 litre milk yield (24.8 per cent) in comparison to control group (T_1). Regarding service period, the mean service period were 142.8, 127.5 and 118.6 days for treatment T_1 , T_2 and T_3 , respectively. Treatment T_3 decreased 24.2 (16.9 %) days and treatment T_2 decreased 15.3 days (10.7 %) service period in comparison to buffalo owners practice. Treatment T_3 had significant effect on service period over buffalo owners practice and T_2 . The net profit from sale of extra milk were computed as Rs.7.60, 24.10 and B: C ratio 1:1.57 and 1:2.12 for the treatment T_2 and T_3 , respectively. It can be concluded that mineral supplementation and balance concentrate mixture feeding according to milk production increases milk production and decrease service period in buffalo.

Key words: Balance concentrate mixture, Buffalo, Service period, Mineral mixture

Introduction

Buffalo is the major milk producing animal in our country (54 percent) with maximum share in world's population. Similarly, the district Sawaimadhopur has also highest buffalo population according to 18th livestock census (buffalo-251589 and cow-118405) in dairy animals which represents 68.0 per cent of the total dairy animals in the district.

Low milk yield, low growth rate and poor reproductive performance (anoestrus, seasonal breeder behavior and long inter-calving period) are major constraints of buffaloes [Qureshi *et al.* (2000), Sahoo *et al.* (2004) and Wynn *et al.* (2009)]. In India, the buffaloes are mainly fed cereal straws that are highly lignified and contain low content of both fermentable protein and carbohydrates. Inadequate and irregular availability of quality feedstuff and imbalance feeding are the main cause of poor performances of buffaloes. To increase the productivity of buffaloes,

supplementation of nutrients, which can improve the utilization of poor quality roughages and fulfill the deficiency of nutrients, are essential as the feed utilization can be increased by supplementation of critical nutrients in ration (Sampath *et al.* 1995).

Long inter-calving period in buffaloes is another major problems in district. The ideal inter-calving period of buffalo is 12 to 15 months but it was observed 18 to 24 months in field condition. Generally, buffaloes may start cycle within three months of calving; if this period increases beyond three months then it called as post-partum anoestrus. Anoestrus is one of the most common cause of temporary infertility in buffaloes, leading to prolonged inter-calving period, delayed conception, reduction in milk yield, less number of calves and lactation in their life time, resulting financial loss to buffalo rears.

Most of the earlier studies to evaluate the impact of mineral supplementation and balance concentrate

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mixture were conducted in research station under controlled conditions. A bench mark survey was conducted to find out the causes of low milk production and long inter-calving period. When prioritize the cause of low milk production and long inter-calving; mineral deficiency, lack of balance concentrate mixture according to milk production and anoestrus were the major cause of the problems. Low milk production and anoestrus/ late pregnancy in buffalo occur mainly due to nutritional deficiency. Therefore, an on-farm testing (OFT) was designed to study the effect of mineral supplementation and balance concentrate on production and reproduction traits of buffaloes under rural management practices.

Materials and Methods

An on-farm testing was conducted on 15 newly calved buffaloes which parturition occurred 20 to 30 days before commencements of trial. The lactating buffaloes were almost same stage of lactation and preferably II to IV order of parturition were selected for the study. The trial was conducted for three consecutive years in three randomly selected villages. Buffaloes were categorized in to three groups, each group having 5 buffaloes. First group of buffaloes were taken as control group (buffalo owners practice) [T₁]. The second group of buffaloes were fed balance concentrate mixture according to milk production @ 1 kg/2.5 litre milk/day [T₂] and third group were fed balance concentrate mixture according to milk production @ 1 kg/ 2.5 litre milk/day + 60 g mineral mixture/day [T₃]. Trial was conducted for a period of three months during winter season (November to February). An on-campus training was conducted

before start the trial of selected buffalo keepers for awareness. Management practices and fodder supplied to the buffaloes were same before and during the treatment. Wheat straw was fed as dry fodder and green fodder availability was limited. It was observed during the bench mark survey that on an average 2.5 Kg (1.5 to 3.0 Kg) concentrate mixture per day was fed to the milch buffaloes by the buffalo keepers. Daily milk yield of individual buffalo was recorded through milk recording index card by the animal owners and also by investigator at weekly interval for fair degree of precision. The buffaloes were closely supervised daily morning and evening by the buffalo owners for heat symptoms. The buffaloes detected in heat were conceived and date was noted. Statistical analysis was done as per Snedecor and Cochran (1968).

Results and Discussion

Daily milk production per buffalo were recorded and depicted in table-1. It revealed that overall milk production was 7.67, 8.57 and 9.57 liter/day for treatment T₁, T₂ and T₃, respectively. The data showed that treatment T₃ increased 1.90 litre milk production which was 24.8 per cent more in comparison to control group. It was observed that treatment T₃ had significant (P<0.05) effect on milk production. The treatment T₂ increased 0.90 litre milk yield (11.7%) but it was found non-significant with the control group. These findings are comparable with Makkar (2001) and Upreti *et al.* (2010).

The data presented in Table 2 indicates that the overall service period was 142.8, 127.5 and 118.6 days in treatment T₁, T₂ and T₃, respectively. Treatment T₃

Table 1: Effect of feeding practice on milk production of buffalo

Treatment	Year wise milk production/day				Per cent increase over control
	2011-12	2012-13	2013-14	Overall milk production	
T ₁	7.68±0.29 ^a	7.42±0.37 ^a	7.90±0.19 ^a	7.67	-
T ₂	8.44±0.70 ^{ab}	8.52±0.38 ^{ab}	8.74±0.36 ^{ab}	8.57	11.7
T ₃	9.42±0.40 ^b	9.66±0.61 ^b	9.62±0.52 ^b	9.57	24.8
LSD (5%)	1.34	1.32	1.28		

Table 2: Service period of buffalo as influenced by feeding practice

Treatment	Year wise service period in days				Per cent decrease over control
	2011-12	2012-13	2013-14	Overall service period	
T ₁	142.2±5.0 ^b	143.6±3.0 ^b	142.6±2.7 ^b	142.8	-
T ₂	126.8±3.5 ^{ab}	127.0±3.4 ^b	128.8±3.2 ^b	127.5	10.7
T ₃	117.0±2.5 ^a	119.0±2.4 ^a	119.8±2.4 ^a	118.6	16.9
LSD (5%)	12.2	7.7	8.4		

Table 3: Relative profitability of different feeding practices in buffalo

Parameters	Treatment T ₁	Treatment T ₂	Treatment T ₃
Extra Milk Yield (Lit./day)	-	0.90	1.90
Extra Income from sale of milk/ day/ buffalo @ Rs. 24/lit	-	21.60	45.60
Feeding of mineral mixture/ day/ buffalo (gms.)	-	-	60
Cost of mineral mixture/ day/buffalo	-	-	3.30
Feeding of concentrate mixture /day/ buffalo (Kgs.)	2.50	3.50	3.80
Cost of concentrate mixture /day/ buffalo (Rs.) @ Rs. 14/ Kg.	35.00	49.00	53.20
Extra cost of concentrate mixture /day/ buffalo (Rs.) over control group (T ₁)	-	14.00	18.20
Total cost of Treatment /day/buffalo (Rs.)	-	14.00	21.50
Net profit /day/buffalo	-	7.60	24.10
B:C Ratio	-	1:1.54	1:2.12

reduced 24.2 and 15.3 days service period in comparison to treatment T₁ and T₂. The treatment T₃ reduced 16.9 per cent service period and it had highly significant (P<0.05) effect in service period over control group but it was non-significant with treatment T₂. Treatment T₂ also reduced 15.3 days (10.7%) service period in comparison to buffalo owners practice but the effect was non-significant. The present findings are in conformity with the results of Mann *et al.* (2000) and Paul *et al.* (2002) who reported that mineral supplementation have positive effect on service period of buffaloes.

The data of economic analysis are presented in table-3. Data revealed that total cost of treatment/day/ buffalo were Rs. 14.00 and Rs. 21.50 for treatment T₂ and T₃, while the net profit/ day/ buffalo were Rs. 7.60 and Rs.24.10 for treatment T₂ and T₃; respectively in comparison to control group (T₁). The benefit cost (B:C) ratio were found 1.54 and 2.12 for treatment T₂ and T₃; respectively.

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