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Effect of Different Dietary Levels of Dcp on the Comositional/Nutritional Quality of Nili-Ravi Buffalos milk at livestock research and Development Station Paharpur, Dera ismail Khan.

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Abstract

A study was conducted to determine the Effect of Different Dietary Levels of DCP Supplementation on the Compositional/Nutritional Quality of Nili-Ravi Buffalo Milk at Livestock Research and Development Station Paharpur, Dera Ismail Khan. Fifteen lactating buffaloes were randomly divided into three groups; with 05 animals in each group fed diets containing 70, 100 and 120% NRC recommended Ca and P, respectively. Milk Samples were collected morning and were analyzed for total solids (TS), milk protein (MP), milk fat (MF), lactose. Milk Fat Percentage and TS Percentage was found higher in buffaloes fed on 120% Ca and P than those fed on 100% and 70% Ca and P of NRC recommendation but dry matter intake was similar among all groups. However, MP, lactose and solids not fat were not affected by DCP supplementation. It may be concluded that 120% Ca and P supplementation increased milk production and reproductive performance of lactating buffaloes.

Introduction

Calcium (Ca) and phosphorus (P) are essentially required for dairy animals in larger amounts than other minerals. Over 70% of the total minerals in the body are Ca and P, while about 99% of the Ca and 80% of P found in the animal are in bones and teeth. Along with other important physiological functions, Ca and P are important constituents of milk and blood plasma, ranging from 9 to 10 and 4 to 6 mg/dl, respectively (NRC). Calcium and P deficiency causes reduced appetite and milk yield, a decline in reproductive efficiency, poor feed utilization, lowered disease resistance, increased incidence of milk fever, reduce growth rate, osteoporosis and osteomalacia (NRC, 2001).

Large ruminants, like buffaloes and cattle mainly derive their nutritional input from crop residues, which constitute more than 50% of the total diet (Hanjra et al., 1995). These crop residues are particularly deficient in minerals and crude proteins (Given and Moss, 1995). Mineral contents of forages are influenced by a variety of factors such as soil moisture, its pH and texture. Phosphorus deficiencies in plants are due the lack of P in parent soil material (Stoddart et al., 1975).

Generally, mineral sources include natural feeds (forages, grains and by-products) and mineral supplements to balance the minerals contents in the feed. It has been observed that dietary minerals supplementation enhanced milk production, milk composition (Al-Nor) in buffaloes. Supplementation of crop residues with concentrates, good quality fresh legumes and minerals can significantly improve feed intake and digestibility, resulting in improved production (Ibrahim, 1983; Manidol, Saadullah,). Kincaid et al. (1981) observed lowered milk production from cows fed rations containing 0.3% phosphorus than from cows fed rations with 0.55% phosphorus. According to Rekhis, supplementation of di-calcium phosphate to dairy cattle had a significant effect on milk fat content and milk quantity and quality (protein and density) were higher in the supplemented group compared to the control group. Wu studied milk production by dairy cows fed three levels of phosphorus (0.31, 0.40 and 0.49%) and found lowest milk yield in 0.31% P group. Parsaad et al. studied mineral supplementation and their influence on nutrients digestibility in buffalo calves and observed that digestibility of dry matter, crude protein and crude fiber were 67.84, 59.34 and 50.35%, respectively. Qureshi reported that increasing Ca and P contents in rations for dairy buffaloes had favourable effects on quality of milk. Although information regarding mineral supplementation in cattle diets is available (Kincaid Rekhis, Wu), but such type of information on Calcium and Phosphorus supplementation in lactating buffaloes is limited. Hence, this study is planned to determine the effect of Ca and P supplementation on the nutritional quality/ composition of Nili-Ravi buffaloes milk.

Materials and Methods

The study was conducted at the Livestock Research and developmental Station Paharpur, Dera Ismail Khan. Fifteen buffaloes of Nili-Ravi breed (3 to 4 years old, average body weight of 500 ± 50 Kg) at first, second and third lactation and producing 6-7 liters/day were randomly divided into three equal groups, and were feed mixed rations containing DCP at 70, 100,

130 grams respectively per group. Di-calcium phosphate (DCP) will be used as Ca and P sources, respectively. Animals were feed ration twice daily before feeding, weighed amount of DCP were mixed in ration and then fed to the animals.

Milk Analysis: Milk samples (200 ml) collected from morning and afternoon milking's were pooled and frozen for subsequent analysis at fortnightly intervals. Samples were thawed immediately before analysis, mixed thoroughly and analysed for total solids, protein, Fat and Lactose percentage by Lacto Scan Analyzer.

Feeding: Nutritional requirements of experimental buffaloes were fulfilled by offering 13.5 Kg of dry matter content per animals which contain 35 Precent of green fodder 20-25 Kg green fodder (Berseem grass, oats grass), 40% of concentrates (Shandar Wanda + Sugar Beet Pulp) and 25 Precent of Wheat Straw. Animals were placed in individual pens equipped with cemented manger and fed ration twice daily. Before morning feeding, weighed amount of DCP were mixed in ration and then fed to the animals.

Statistical Analysis

Data collected on different parameters were subjected to statistical analysis by using analysis of variance technique under completely randomized design. Means of different parameters were tested by using least significant difference (Steel and Torrie).

Results and Discussion

The Result of DCP on milk composition of experimental buffaloes fed on 120, 100 and 70%. are given in Table 1. Buffaloes higher milk protein was observed in 120% followed by 100% and 70% Ca and P supplemented groups but there was no difference among the groups. Higher milk fat was observed in buffaloes fed on 120% Ca and P, followed by buffaloes fed on 100% and 70% Ca and P. An increase in milk total solids was observed with increasing level of Ca and P supplementation. Buffaloes fed on 120% Ca and P level produced milk with maximum total solids and 70% fed group had minimum total solids. Buffaloes fed on 100% Ca and P had highest milk lactose content, followed by those fed on 70 and 120% Ca and P supplementation. Findings of the present study are in agreement with those of Begum I who reported Significant increase in the Total solids and fat content of milk in higher DCP supplementation groups to those groups who were given low dose rates. In the present study, lactose content did not vary significantly throughout the lactation because the close relationship between lactose synthesis and the amount of water drawn into milk makes lactose a stable milk component (Pollot).

Table1: Effect of DCP supplementation on milk composition in lactating Nili Ravi buffaloes.

Parameters	70grams (Average) DCP Mix With Feed	100grams (Average) DCP	120grams (Average) DCP Mix With Feed
Milk Composition		Mix With Feed	
Protein %age	4.17 ± 0.07	4.21± 0.07	4.37± 0.10
Lactose %age	4.52 ± 0.05	4.65 ± 0.07	4.56 ± 0.05
Fat %age	6.93 ± 0.07	6.94 ± 0.08	7.24 ± 0.11
Solid Not Fat %age	8.70 ± 0.05	8.86 ± 0.05	8.93 ± 0.07
Total Solid %age	15.63 ± 0.11	15.80± 0.11	16.17± 0.15

Conclusions

Results of the present study discovered that supplementation of 120% DCP in diets of lactating buffaloes increased total solids of milk, milk fat to the groups which were fed at the rate of 70% and 100% DCP supplemented groups. This indicates that minerals supplementation is important to reduce the economic losses due to minerals deficiencies and helpful in increasing the income of farmers due to milk composition was enhanced as well as production in lactating Nili-Ravi buffaloes.

References

1. Begum I, A Azim, S Akhter, MI Anjum and M Afzal, 2010. Mineral dynamics of blood and milk in dairy buffaloes fed on calcium and phosphorus supplementation. Pak Vet J, 30(2): 105-109.
2. Al-Nor SA, HA Fathy and F Abudou, 2004. Yield and quality of milk and cheese in response to adding some herb combinations with or without minerals in buffaloes. Egypt J Dairy Sci, 32(2): 377-386.
3. Pollott GE, 2004. Deconstructing milk yield and composition during lactation using biologically based lactation models. J Dairy Sci, 87: 2375–2380.
4. AOAC, 1990. Official Methods of Analysis. 15th Ed. Association of Analytical Chemists,
5. Arlington, Virginia, USA. Boda JM and TH Cole, 1980. Calcium metabolism with special reference to parturient paresis (milk fever) in dairy cattle: a review. J Dairy Sci, 63: 54-64.
6. Brodison JA, EA Goodall, JD Armstrong, DI Givens, FJ Gordon, WJ McCaughey and JR Todd, 1989. Influence of dietary phosphorus on the performance of lactating dairy cattle. J Agri Sci (Camb), 112: 303- 311.
7. Call JW, JE Butcher, JL Shupe, RC Lamb, RL Boman and AE Olson, 1987. Clinical effects of low dietary phosphorous concentrations in feed given to lactating dairy cows. Am J Vet Res, 48: 133–136.
8. Forar FL, RL Kincaid, RL Preston and JK Hillers, 1982. Variations of inorganic phosphorus in blood plasma and milk of lactating cows. J Dairy Sci, 65: 760–763. Gaines T, P Joe, W West and JF McAllister, 1989.
9. Determination of calcium and phosphorus in milk. J Sci Food Agri, 51: 207-213. Given DI and AR Moss, 1995. The nutritional value of cereal straw for ruminants: a review. Nutr Abstr Rev, 65(11): 793-811.
10. Hanjra SH, JB David and MJA Akhtar, 1995. Fodder Production. FAO, PAK/88/072. Smallholder dairy development in Punjab, Gujranwala, Pakistan. Ibrahim MNM, 1983.
11. Physical, chemical, physico- chemical and biological treatment of crop residues. In: The Utilization of Fibrous Agricultural Residues. R. Pearce (ed), Australian Government Printing Service, Canberra, Australia, pp: 53-68.

12. Kincaid RL, JK Hillers and JD Cronrath, 1981. Calcium and phosphorus supplementation of rations for lactating cows. J Dairy Sci, 64: 754-758.