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EFFECT OF SCIENTIFIC BALANCE AND CONVENTIONAL RATIONS ON YIELD AND COMPOSITION OF MILK IN KUNDHI BUFFALOES

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ABSTRACT

The experiment was conducted on 12 buffaloes between 6 +1 years of age, weighing between 500 + 50 kg kept at dairy farm, Tandojam. Four Kundhi Buffaloes were randomly allocated to each group A, B and C. Buffaloes in group A was fed on conventional ration, buffaloes in group B were fed on scientifically balanced ration prepared by researcher at department of Animal Nutrition, Sindh Agriculture University Tandojam and buffaloes in group C were given commercial dairy ration purchased from Hyderabad market. Milk yield of group-A, B and C was 4.93 ± 0.50, 6.73 ± 1.02 and 6.27 ± 1.198 liter/d, respectively. Milk production was significantly decreased (P<0.01) in Group-A than B and C, whereas, group-B produced significantly more (P<0.01) milk per day than C. Milk yield of Group-A, B, and C were 1794.30 ± 41.04, 2450.32 ± 64.95, 2280.38 ± 61.57 liter/buffalo, respectively. Milk production was significantly lower (P<0.01) in group-A than C, whereas, group-B produced significantly more (P<0.01) milk per buffalo than group-A and C. The total cost per day on feeding of conventional, scientific balanced and commercial ration were 124, 155 and 139 rupees and total profit per day was 48.38, 80.55 and 80.45 rupees respectively On scientific balanced rations buffaloes produced high milk yield and it was comparatively more profitable than conventional and commercial dairy rations.

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INTRODUCTION

Livestock contribution to agriculture value added stood at 58.6 percent while it contributes 11.6 percent to the national GDP during 2015-16 as compared to 56.4 percent and 11.7 percent during the corresponding period last year, respectively (Anonymus, 2016). Buffalo contribute 66.6% in Pakistan and major source of milk production contributing 12.1% in world, 38.0% in Asia's total milk production. In addition to the milk, the buffalo contributes 1.3 in world, 2.8 in Asia and 24.4% in Pakistan of total meat in these countries (FAO, 2007). The shortage of conventional feed resources is also a major constraint for increased milk productivity. A shortage is overcome by conserving forages as hay or silage and formulating feed ratios for milk producing buffalo's starts with theoretical calculating of their requirements. Due to lack of established feeding standards for dairy buffaloes. The conventional feeding system adopted by buffalo dairy farmers in Sindh province is strongly criticized because of imbalance formulation directly affecting health status, quantity and quality of milk produced. There are a number of commercial rations in the market manufactured by various companies. Care should be taken to ensure that the quality of the commercial ration is up to the standard and requirement of dairy buffalo. Various pilot studies conducted in different

agro-climatic regions of the countries revealed that it is possible to increase the productivity and reduce the cost of milk production through balanced feeding in an environmentally sustainable manner (Garg *et al.* 2013). Therefore, the study was planned to compare the quality and quantity of buffalo milk and cost effectiveness and performance under balance and conventional feeding regimens in Kundhi buffaloes

MATERIALS AND METHODS

The experiment was conducted on 12 kundhi buffaloes between 6 ±1 years of age, weighing between 500 ± 50 kg kept at dairy farm, Mircolony, Tandojam. Four Buffaloes was randomly allocated to each group A, B and C. Buffaloes in group A was fed on conventional ration, buffaloes in group B was fed on scientifically balanced ration prepared by researcher at department of Animal Nutrition, Sindh Agriculture University Tandojam and buffaloes in group-C were given commercial dairy ration available in Hyderabad market Composition of Various Rations fed to Kundhi buffaloes.

INGREDIENTS	Conventional ration	Scientifically balanced ration	Commercial Ration
	Group A	Group B	Group C
Barseem (kg)	8	8	8
Wheat Straw (kg)	4	4	4
Cotton Seed Cake (kg)	4	3.2	1.4
Mustard Cake (kg)	0	0.2	0.2
Moong Kutta (kg)	0	1.0	1.0
Wheat Bran (kg)	2	0.8	2.0
Maize Crushed (kg)	0	0.4	1.0
Rice Polish (kg)	0	2.0	0.8
Molasses (kg)	0	0.4	0.8
Di-Calcium Phosphate / Limestone (kg)	0	0.05	0.05
NUTRIENTS			
Dry Matter (%)	61	61	61
Crude Protein (%)	18	16	13
Total Digestible Nutrients (%)	67	67	66
Crude Fiber (%)	19	19	18
Ash (%)	7	19	19
Calcium (%)	0.78	0.78	0.79
Phosphorus (%)	0.66	0.66	0.63

Daily milk yield was recorded on day-to-day basis for 90 days.

Data Analysis

The data thus collected was tabulated, entered and statistically analyzed to discriminate the superiority of treatment means using analysis of variance for overall significance of differences and L.S.D test was employed to compare the treatment groups as suggested by Gomez and Gomez (1984). Milk production and composition were analyzed by a randomized statistical model as described by Tessmann *et al.* (1991)

RESULTS

Milk yield of Group-A, B, and C were 4.93 ± 0.50, 6.73 ± 1.02 and 6.27 ± 1.198 liter/d, respectively (Table-). There was significant (P<0.01) decrease in the milk production of Group-A than B and C, whereas, group-B produced significantly more (P<0.01) milk per day than group-C. The total cost per day on feeding of conventional, scientific balanced and commercial rations were Rs.124, Rs. 155 and Rs. 139 and total profit per day was Rs. 48.38, Rs. 80.55 and Rs. 80.45 respectively (Table-14 and Fig-11). Whereas, Total cost on feeding of conventional, scientific balanced and commercial rations were Rs.11175, Rs.13950 and Rs.12510 and net profit was Rs. 4354.5, Rs. 7249.5 and Rs. 7240.5 respectively (Table-15 and Fig 12). The scientific ration was expensive but more profitable than conventional and commercial ration.

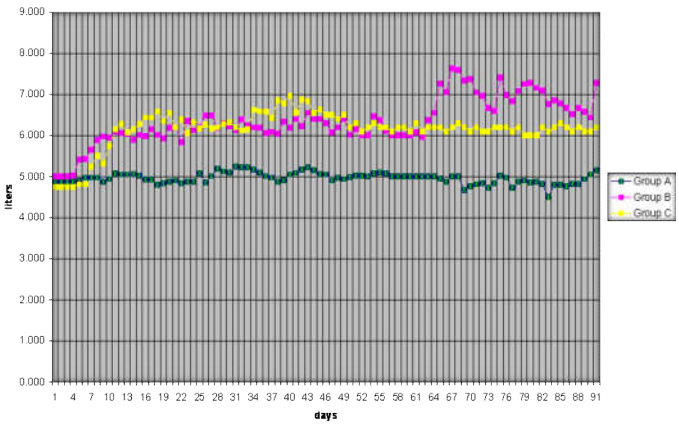

Fig. 1. Milk yield per day on traditional, Scientific balanced and comercial rations in buffaloes

Table 1. Effect of Various Rations on yield and composition of milk in Kundhi buffaloes

Particulars	Group-A	Group-B	Group-C
Milk Yield (liters/buffalo)	1794.30^{aa}±41.04	2450.32^{aabb}±64.95	2280.38^{aabb}±61.57
Milk Yield liter/day	4.93^{aa}±0.50	6.73^{aabb}±1.02	6.27^{aabb}±1.198
Post treatment period (days)	90±0.0	90±0.0	90±0.0

Table 2. Cost effectiveness and performance of buffaloes on Various Rations

Rations	Milk yield (Lt/day)	Milk Earning (Rs./day)	Ration cost (Rs./day)	Net Profit (Rs./day)
Conventional	4.93	172.55	124	48.38
Scientific Balanced	6.73	235.55	155	80.55
Commercial	6.27	219.45	139	80.45

Table 3. Total cost of different rations, earnings and net profit on various rations during experimental period in buffaloes

Rations	Total cost on ration (Rs.)	Total earning on milk (Rs.)	Net profit (Rs.)
Conventional	11175	15529.5	4354.5
Scientific Balanced	13950	21199.5	7249.5
Commercial	12510	19750.5	7240.5

DISCUSSION

The role of balance and scientific ration in achieving high and sustainable livestock and milk productivity is fundamental and imperative. Proper nutritional management is the key to a successful animal reproduction and health program. Over the last four decades a number of animal-nutrition-based technologies and practices have been developed and applied with varying degrees of success. Some technologies have produced profound beneficial effects and have been employed widely; whereas, others have shown potential on research stations but have not been taken up by farmers (Mehra, 2001). The present study was conducted on twelve buffaloes were randomly divided in three groups A, B, and C placing four buffaloes in each group and kept at a commercial dairy farm, Mircolony, Tandojam.

Buffaloes in group A were fed on conventional rations, buffaloes in group B were fed on scientifically balanced ration prepared by researcher at Department of Animal Nutrition, Sindh Agriculture University Tandojam and buffaloes in group C were given commercial dairy ration purchased from Hyderabad market. Feeding pattern for buffaloes all over the world is subjected to forages and crop production of the season which affects the level of milk production. Milk production for the first 12 weeks of 4th lactation was analyzed by a randomized statistical model as described by Tessmann *et al.* (1991). The effect of different ration on milk production and composition are shown in Table-1 and Figure-1. Milk yield response to commercial rations averagely increased 1.8 liter/day ($P<0.01$) and 1.34 ($P<0.01$) liters per day from group-A than B and C respectively through experimental period (Table- 1). Milk yield response to scientifically balanced rations averaged 656 liters ($P<0.01$) and 448 liters ($P<0.01$) liters from group-A than group-B and Group-C respectively throughout the experimental period (Table-1). Milk secretion curve showed progressively increased pattern with group-B and C, whereas, group-A remained constant with little or no variation in milk yield/day (Figure-3).

Milk production increased steadily throughout the study period in group-B and C in the middle of period and then diminished toward basal production thereafter. The effect of different ration on milk yield was recorded high in group-B followed by group-A and C. The study is closed agreement with the other study mentioned the improvements in milk yield in response of scientific ration formulation (McGuffey *et al.* 1990, Fronk *et al.* 1983 and Peel *et al.* 1983). Milk yield of Group-A, B and C were 4.93 ± 0.50, 6.73 ± 1.02 and 6.27 ± 1.198 liter/d, respectively (Table-6). There was significant ($P<0.01$) decrease in the milk production of Group-A than B and C, whereas, group-B produced significantly more ($P<0.01$) milk per day than group-C.

These improvements in milk yield are similar to those reported by others in cows (McGuffey *et al.* 1990, Fronk *et al.* 1983 and Peel *et al.* 1983). Milk yield of Group-A, B and C were 1794.30 ± 41.04, 2450.32 ± 64.95, 2280.38 ± 61.57 liter/buffalo, respectively (Table-1). There was significant difference ($P<0.01$) between the Group-A and C, whereas, group-B produced significantly m Milk composition during 12 week of period was unaffected by different rations. In the present study the composition of milk was not affected by different ration. The other study also very closed and indicated the lack of change in milk composition was consistent with previous long term studies (Bauman *et al,* 1989, Bauman *et al,* 1985, Peel *et al.* 1983, and Soderholm *et al.* 1988) and further supported the normality of milk from different rations being fed to buffaloes. There was statistically no difference among the composition of various groups. In respect of economic status of milk production, it was calculated high in case of scientific based ration as stated in group-B. In another study by Bardhan *et al.,* (2005) indicated that feeding cost contributes about 60 to 70% of total cost of milk production. After providing balanced ration to the animals, it was authenticated that the average feed decreased and milk production was increased (Garg *et al,* 2009; Bardhan *et al.,* 2005). On the basis of above findings, it was concluded that scientifically balanced feed enhance the milk production as well as economic significance rather than conventional or commercial feed.

ore ($P<0.01$) milk per buffalo than group-A and C.

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