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Studies on Nutritional Status and its Relationship to Milk Production of Lactating Murrah Buffaloes of Rural Areas of Kushinagar District (U.P.)

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Abstract

Feeding system of Murrah Buffaloes on the availability of crop residues and crop by-products and pasture and grasses on common property resources. The present work was therefore taken up the assess of the proximate compositions of commonly available feed stuffs in rural areas of Kushinagar District (UP) feed sample were collected from 250 households were randomly selected from 10 villages of 05 block in District. Each block contain 02 village and each villages included 25 farmers. Which were categorized in to 05 groups on the basis of land holding capacity, Landless, Marginal, Small, Medium and Large categories offarmers. Each category included equal number of farmer in each village. Data were collected in winter, spring, summer, rainy and autumn season.

Key words : *Dry matter intake, digestible crude protein intake, total digestible nutrient, total solid substance, solid not fat.*

Introduction

India is predominantly an agrarial economy with more than 70% of the population in village depending upon agriculture. Animal husbandry and allied sector activities for the livelihood. Among many livestock enterprises, dairying is the most ancient occupation established in the rural setting of your country, dairy sector contributed significantly in generating employment opportunities and supplements less labors of rural India, besides providing food security (1). The Indian former maintain a large number of cows and buffaloes in rural areas, cow mostly maintained for producing good quality draft bullocks as well as for milk production, however buffaloes are maintained for fat rich and meat production. The present time feed and fodder in the district kushinagar have aremarkeable gap between availability and requirement.

Materials and Methods

The present study was conducted during the different seasons of the years 2019-2020 *viz*., winter, spring, rainy, summer and autumn seasons. Murrah buffaloes owners were selected from different village of kushinagar district of UP to assess the feed consumption, and milk production and its composition and feed milk relationship of buffaloes in rural areas of kushinagar. Two hundred fifty lactating Murrah buffalos were randomly selected from ten village of five blocks in kushinagar districts each block contain two village and each village included 25 farmers, which are categorized into 05 groups on the basis of land holding capacity like landless, marginal, small, medium and large category of farmer.

In present investigations data were collected with the help of questionnaire during survey from the individual farmer and by personal observation. Measurement of animal bodyweight of the individual animal was calculated by using Minnesota formula (2),

Body weight (kg) = L x $(G)^2$ / 660

Where L = Body length from shoulder point to pin bone in inch.

G = Chest girth in inch.

Order and stage of lactation of buffaloes was recorded from individual farmer during survey. The quantity of feed and fodder offered to various groups of animal during 24 hrs. were recorded by weighimg or oral inquiries, Grazing intake was also recorded. The samples of feed and fodder fed to various animals were collected (minimum 500 gm) from the owners for proximate analysis as per method of (3). The quantity of DM, DCP, and TDN intake by different animal were calculated from the record of intake of feed and fodder using average digestibility coefficient value given by (4). The dry matter intake in winter and summer seasons were35% and 20% respectively after full grazing against the standard requirement given by (5).

The milk sample were collected from the buffalo owners and addedwith 0.5 ml. formaldehyde then brought to laboratory and analyzed for the fat, protein, lactose ash TSS and SNF. According to method by.

The feed milk relationship was established by using milk yield per animal/day in each seasons as dependent

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Table-1 : Seasonal variation in average milk yield (Lt.) and its composition in buffaloes.

Content	Winter season	Spring season	Summer Season	Rainy Season	Autumn Season	Average
Milk (Lit/day)	5.26 ± 0.059	5.55 ± 0.135	5.33 ± 0.20	5.84 ± 0.165	5.49 ± 0.167	5.47 ± 1.27
Water (%)	83.34 ± 0.21	82.88 ± 0.18	82.60 ± 0.15	82.80 ± 0.10	82.97 ± 0.12	82.89 ± 0.16
Fat (%)	4.69 ± 0.169	4.58 ± 0.13	4.89 ± 0.11	4.77 ± 0.09	4.69 ± 0.11	4.72 ± 0.13
Protein (%)	4.111 ± 0.08	4.28 ± 0.122	4.82 ± 0.14	4.74 ± 0.12	4.77 ± 0.14	4.54 ± 0.13
Lactose (%)	4.45 ± 0.14	4.75 ± 0.12	5.09 ± 0.19	4.82 ± 0.10	4.71 ± 0.11	4.76 ± 0.14
Ash (%)	0.742 ± 0.0061	0.742 ± 0.051	0.772 ± 0.061	0.754 ± 0.048	0.74 ± 0.061	0.750 ± 0.036
Total Solid (%)	16.66 ± 0.21	17.11 ± 0.19	17.40 ± 0.15	17.19 ± 0.01	1725 ± 0.19	17.12 ± 0.017
SNF (%)	11.97 ± 0.19	12.53 ± 0.20	12.50 ± 0.12	12.42 ± 0.11	12.55 ± 0.20	12.39 ± 0.13

Table-2 : Feed milk relationship with nutrient input in buffaloes (Cabb-Duglass Model).

Category of Farmers	No. of Observation	Intercept	Regression Coefficients				R^2
			DCP (X_1)	TDN (X_2)	Order of Lactation (X_3)	Stage of Lactation (X_4)	
Winter Season							
Landless	50	2.945 (1.586)	0.391 (0.148)*	0.462 (0.134)**	0.128 (0.460)	0.794 (0.335)*	0.93
Marginal	50	0.582 (0.122)	0.911 (0.216)**	0.585 (0.197)**	0.032 (0194)	0.246 (0.155)	0.75
Small	50	2.629 (0.532)**	0.326 (0.101)**	0.141 (0.035)**	0.109 (0.128)	0.855 (0.276)**	0.73
Medium	50	0.230 (0.087)**	0.470 (0.145)**	0.259 (0.072)**	0.550 (0.319)	0.100 (0.022)**	0.73
Large	50	3.94 (2.049)	0.242 (0.030)**	0.2048 (0.039)**	1.90 (0.033)**	0.415 (0.108)**	0.78
Average	50	2.075 (0.852)	0.468 (0.128)	0.3388 (0.0954)	0.5438 (0.2268)	0.482 (0.179)	0.82
Spring Season							
Landless	50	0.945 (0.172)**	0.867 (0.177)**	0.428 (0.155)**	0.130 (0.023)**	0.199 (0.025)**	0.88
Marginal	50	2.559 (0.328)**	0.611 (0.105)**	0.522 (0126)**	0.610 (0.210)**	0.733 (0.236)**	0.68
Small	50	1.224 (0.254)**	0.912 (0.083)**	0.216 (0.051)**	0.190 (0.034)**	0.349 (0.029)**	0.76
Medium	50	0.942 (0.324)**	0.404 (0.155)**	5.66 (0.215)**	0.3239 (0.154)*	0.838 (0.286)**	0.78
Large	50	0.357 (0.035)	0.539 (0.156)**	0.539 (0.155)**	0.465 (0.252)	0.427 (0.158)*	0.75
Average	50	1.2056 (0.2226)	0.644 (0.1356)	0.4542 (0.1404)	0.3436 (0.1346)	0.509 (0.147)	0.77
Summer Season							
Landless	50	1.162 (0.140)**	0.835 (0.098)*	0.645 (0.183)**	0.619 (90.256)**	0.419 (0234)*	0.53
Marginal	50	0.493 (0.075)**	0.688 (0.280)**	0.754 (0.276)**	0.167 (0.027)**	0.535 (0.227)**	0.84
Small	50	2.869 (1.158)*	0.718 (0.343)*	1.134 (0.146)**	0.721 (0.153)**	0.411 (0.145)**	0.83
Medium	50	0.834 (0.262)**	0.352 (0.112)**	0.509 (0.157)**	0.741 (0.200)**	0.935 (0.323)**	0.74
Large	50	1.088 (0.465)*	2.141 (0.190)*	0.854 (0.304)**	0.731 (0.250)**	0.592 (0.116)**	0.75
Average	50	1.2892 (0.42)**	0.9484 (0.2046)*	0.7792 (0.2672)**	0.5958 (0.1771)**	0.5784 (0.209)**	0.74
Rainy Season							
Landless	50	2.365 (0.0497)**	0.981 (0.350)**	0.640 (0.239)**	0.292 (0.378)	0.382 (2.77)	0.69
Marginal	50	2.489 (1.434)	0.979 (0.360)**	0.711 (0.19)**	0.010 (0.229)	0.077 (0.49)	0.71
Small	50	4.141 (1.474)**	1.234 (0.372)**	0.668 (0.197)**	0.208 (0.217)	0.200 (0.303)	0.77
Medium	50	3.613 (1.400)*	0.530 (0.215)*	0.297 (0.077)**	0.161 (0.121)	0.235 (0.195)	0.80
Large	50	2.215 (0.426)**	0.585 (0.170)**	0.586 (0.270)*	0.176 (0.259)	0.349 (0.183)	0.68
Average	50	2.964 (0.964)	0.862 (0.294)	0.580 (0.196)	0.169 (0.241)	0.249 (0.760)	0.73
Autumn Season							
Landless	50	2.398 (0.949)*	0.932 (0.296)**	0.545 (0.194)**	0.285 (0.136)*	0.143 (0.141)	0.79
Marginal	50	0.912 (0.491)*	0.812 (0.328)*	0.523 (0.229)*	0.161 (0.395)	0.200 (0.283)	0.82
Small	50	0.862 (0.260)**	0.371 (0.026)	0.929 (0185)**	0.242 (0.327)	0.383 (0.345)	0.64
Medium	50	5.366 (.272)**	0.446 (0616)	0.110 (0.021)**	0.360 (0.274)	0.500 (0.204)*	0.56
Large	50	2.803 (1.510)	0.675 (0.167)**	0.620 (0.152)**	0.261 (0.192)	0.119 (0250)	0.70
Average	50	2.468 (0.897)	0.643 (0.287)	0.545 (0.156)	0.262 (0.265)	0.269 (0.245)	0.70

variable with DCPI and TDNI order and stage of lactation as independent variables The statically method adopted in the analysis of data by formula, (Linear model and Cobb-Douglas model).

Cob-Douglas Model-$Y= ax_1^{b1}x^{b2}{}_2x_3^{b3}x_4^{b4}$

Where, a = intercept or constant

b = Regression coefficient of independent variable

Y = milk yield/animal/day dependent variable

X1 = DCPI/animal/day (kg) independent variable

X2 =TDNII/animal/day (kg)independent variable

X3 = Order of lactation (number)independent variable

X4 = Stage of lactation (number)independent variable

Results and Discussion

The average milkyield and its composition in winter, spring, summer, rainy, and autumn seasons of the years has been present in table. Milk production were found significantly higher in rainy seasons followed by other seasons, similar observation was reported by (6).

(7) Analysis of variance data indicate in water percentage in milk, were found highest in winter seasons followed by other category of farmer in all seasons, similar observation was reported by (8). And SNF were found significantly higher in autumn seasons compression to other seasons under all category of farmers, similar observation was reported by (8). Milk fat, protein, lactose, ash and TSS were found significantly higher in summer seasons compression to other seasons of the years under all category of farmers similar observation was reported by (8). All milk constituent found higher in second and third lactation period in murrah buffaloes.

Cobb-Douglas model was found best for this analysis on the basis of R^2 value and also the significance of the regression coefficient R^2 value revealed that 82%, 77%, 74%, 73%, and 70% of variation in milk production were explained by this variable during winter, spring, summer, rainy and autumn seasons of the years. The R^2 value was comparatively higher 93% in winter for landless category, 88% in spring for landless category, 84% in summer for marginal, 80% in rainy for smalland 82% in autumn for marginal farmer. R^2 value were lower under winter, and autumn in small, spring in marginal, summer in landless and rainy in large category of framers, respectively. Digestible crude protein intake (DCP) was observed positive and significantly related with milk production in all category of farmers under all seasons of the years except marginal in rainy seasons and large in autumn seasons of the years. TDN was observed positive and significant in all category of farmer uder all seasons of the years. The order of lactation was found in large category of farmer under in winter seasons and spring seasons was found positive and significantly in landless, marginal, small and medium category of farmers, except large category of farmer. stage of lactation in summer seasons in all category farmer was found positive and non-significant in all category of farmers, in autumn seasons wasfound positive and significant in landless category o farmers.

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