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RESEARCH ARTICLE

THE FACTORS AFFECTING MILK YIELD IN DIARY FARMING IN GREATER GUWAHATI REGION OF ASSAM

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Abstract

The production of milk is conceived of several factors and a very multifarious process. "The knowledge of relative importance of the resource inputs influencing in milk production is essential for the dairy farmer for introducing desirable change in his operation at micro level and for the policy maker for formulating plans for improvements in dairy cattle productivity based on sound economic principles at the macro level" (Rao, 1985). The income level of the dairy household is determined by the production of milk they produce at their farms. Generally, the income of the dairy household increases when the milk production cost decreases or when the milk production increases. For this it is essential to study the factors which directly or indirectly effect the milk production. Household samples have been selected both from the municipal wards of Guwahati Municipal Corporation area. Out of 672 dairy farming households, 201 household have been selected for the survey. Regression analysis has been used for the study of factors affecting milk production in greater Guwahati region of Assam.

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Introduction:-

Dairy farming plays an important role in livelihood of dairy farmers. All the economic impacts are interlinked in terms of social impact such as income from sale of animals, milk cash, fertilizer and biogas. Rao (1985) in his study on factors effecting in milk production found that green fodder and concentrates, are the principle factors affecting milk production in all size-groups of farms. Tumutegereize et al. (1999) mentioned that the breed of cow reared, purchased feeds and experience in dairy farming are the major factors that affect in dairy farming. They also mentioned that lack of support service such as extension service, insurance and credit facilities hampers in milk production. Oguz, C. and Canan, S. (2016) in their study mentioned that "higher properties of lactating cows, expense on concentrates and supplements and spending more labor hours in farm activities increase the efficiencies while availability of European crossbred animals, higher education levels, male farmers, full-time dairy farming and being a member of farming society decreases occurrence of the inefficiencies". The variables must be logical, relevant and applicable to the phenomenal facts. Considering the facts a no of attributes pertaining to the socio-economic status of dairy farming families has been included in the present study.

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Objectives:-

Based on the background outlined above, the main objectives for the study are

- (i) To study about the bovine and dairy production in Assam
- (ii) To analyze the factors affecting milk yield in greater Guwahati region of Assam

Study Area

Assam is a northeastern state of India, bordering with Bhutan and other northern states of the country known as Seven Sisters State. Assam is located near the Himalayas and has absolutely amazing natural view. It is bordered by the states of Arunachal Pradesh, Nagaland, Manipur,

Mizoram, Tripura, Meghalaya, as well as Bangladesh, Bhutan, and West Bengal. Assam covers an area of 78,438 km² (30,285 sq mi). Assam has a latitudinal extension of 24° N to 28° N and a longitudinal extension of 89° 45' E to 96° 00' E.

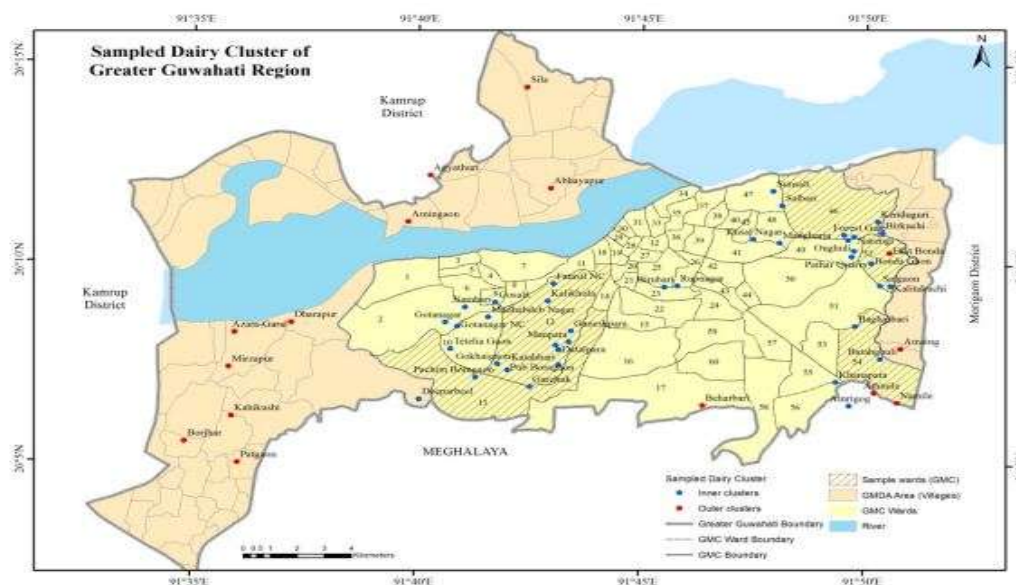


Figure 1:- Study area.

Methodology:-

The present study is based on both primary and secondary data. Household samples have been selected both from the municipal wards of Guwahati Municipal corporation area and the extended area of GMDA. Within GMC area, out of total 672 households from sampled clusters, 201 households have been selected randomly as sampled dairy households. Thus sample size stands at 30%. Different types of data from various sources were acquired for this study. Secondary sources pertain to data like Census of India report, the Statistical Handbook published by the Government of Assam, Dairy co-operatives, District Animal Husbandry Department, and Town Milk Supply scheme. Some other relevant information has also been collected from various books, journals and periodicals.

Result and Discussion:-

Status of bovine stock and dairy production in Assam

The per capita availability of milk for the year 2018 – 19 is estimated on the basis of total milk production and total population of the state for the period. As such the per capita availability of milk is estimated to have become 73 gram per day which is much lower than the norms of 208 gram milk per day determined by ICMR. The availability of milk in the state is 35.13% of the total requirement during the year 2018 – 19. This clearly shows that the state is still a deficit state in terms of milk production. The deficit is met by the supply of milk from outside the state especially from AMUL (Gujarat).

Selection of factors that affect in milk production

Keeping the above aspects in mind the factors that affect in milk production in the Greater Guwahati Region is classified into 2 categories- Socio- economic factors of the dairy households (education, household size, family type,

community, experience in dairy farming, monthly gross income, monthly expenditure, herd size, fully involvement of male members, fully involved female members, partly involved male members, partly involved female members, etc) and the types of breeds reared in the dairy farms(cattle numbers, breeds type, no. of milk cattle, milk production, etc).

The cause effect relationship between the factors that influence in milk production gives the clues for forwarding the arguments in the present study. Based on the dimension as mentioned above the milk production factors are selected as below

Socio-Economic Factors

The socio- economic factors and the milk production of the dairy households are determined with the help of Multiple Regression Analysis using steps wise mentioned as under –

Regression Analysis

Predictors: Milk production (in liter/per month)

X1 – Education of Family Head,X2 – Household Size (in group),X3 –Family size,X4 – Community ,X5 – Experience in Dairy Farming,X6 – Monthly Gross Income from all sources (Rs. in group),X7 – Monthly Total Expenditure (in group) ,X8 – Heard Size (In group),X9 – Fully involvement of Male members ,X10 – Fully involvement of Female members ,X11 – Partly involvement of Male members,X12 – Partly involvement of Female members

Table 1:- Milk Production factors.

	Variables		Frequency	Percentage
X1	Education of the family head	Illiterate	112	27.7
		Primary	49	12.1
		M E	113	32.9
		HSLC	55	13.6
		HS	35	8.7
		Graduate	14	3.5
		P.G	6	1.5
		Total	404	100
X2	Household Size	1 – 4	181	44.8
		5 – 6	140	34.7
		7 – 9	83	20.5
		Total	404	100
X3	Community	Nepali	298	73.8
		Bihari	50	12.4
		Assamese	32	7.9
		Bangali	12	3.0
		Punjabi	2	0.5
		Others	10	2.5
		Total	404	100
X4	Experience in Dairy Farming	Up to 10	31	7.7
		11 – 20	82	20.3
		21 – 30	197	48.8
		Above 30	94	23.3
		Total	404	100
X5	Monthly Gross income	Up to 50,000	118	29.2
		50,001 to 1,00,000	136	33.7
		1,00,001 to 1,50,000	62	15.3
		1,50,001 to 2,00,000	32	7.9
		Above 2,00,000	56	13.9
		Total	404	100
X6	Family Type	Nuclear	297	69.1

		Joint	125	30.9
		Total	404	100
X7	Monthly Total Expenditure	Up to 20,000	115	28.5
		20,001 to 40,000	115	28.5
		40,001 to 60,000	46	14.4
		60,001 to 80,000	28	6.9
		80,001 to 1,00,000	23	5.7
		Above 1,00,000	77	19.1
		Total	404	100
X8	Herd Size (in number)	1 – 10	142	35.1
		11 – 20	130	32.2
		21 – 30	72	17.8
		31 – 40	32	7.9
		Above 40	28	6.9
		Total	404	100
X9	Age Group (years)	0 – 14	227	16.1
		15 – 29	369	34.3
		30 – 44	446	25.9
		45 – 59	320	18.5
		60 and Above	92	5.4
		Total	1724	100
X10	Fully Involvement male member		410	89.7
X11	Fully Involvement female member		47	10.3
X12	Partly Involvement male member		297	39.3
X13	Partly Involvement female member		458	60.7

Table 2:- Model Summary of Regression Analysis.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.923	.852	.848	638.198

The coefficient of multiple determinations, R^2 indicating the percent of how much of the total variance is explained of the independent variables. The obtained $R^2 = .852$ is a good enough for explain the regression model for the analysis.

Table 3:- ANOVA.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	918032202.747	13	70617861.750	173.382	.000
	Residual	158845871.016	390	407297.105		
	Total	1076878073.762	403			

Dependent Variable: Milk production (in liter/Per month)

In above ANOVA analysis the variance of the predictors to the dependent variable has found the $F=173.382$ and $P=.000$ which indicates that the difference is significant at 1% level. It means that the regression model is fit for further Regression analysis.

Table 4:- Coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1071.393	244.888		-4.375	.000

Education	26.706	23.973	.024	1.114	.266
Household Size	-41.687	50.149	-.020	-.831	.406
Family Type	-	-	-	-	-
	84.606	140.435	.012	.602	.547
Community	-25.882	45.763	-.013	-.566	.572
Experience in dairy farming	26.061	45.368	.013	.574	.566
Total Gross Income Group	989.343	47.737	.824	20.725	.000
Total Exp Group	.700	42.992	.001	.016	.987
Cattle No Group	130.784	56.171	.096	2.328.	.020
Fully inv male	195.145	50.865	.093	3.837	.000
Fully inv female	4.934	115.479	.001	.043	.966
Partly inv male	-55.857	42.071	-.029	-1.328	.185
Partly inv female	-10.396	47.460	-.005	-.219	.827
Age group	15.533	16.090	.022	.965	.335

Dependent Variable: Milk production (in liter/per month)

Based on the nonstandard coefficients we obtained the regression equation:

$Y = -1071.393 + 26.706 X_1 - 41.687 X_2 - 84.606 X_3 - 25.882 X_4 + 26.706 X_5 + 989.343 X_6 + 42.992 X_7 + 130.784 X_8 + 195.145 X_9 + 4.934 X_{10} - 55.857 X_{11} - 10.393 X_{12} + 15.533 X_{13}$. Monthly Milk production in the dairy farm is correlated with the predictors. The predicted variables are X_1 - Education of head of the household, X_2 -Household size, X_3 -Family Type, X_4 -Community, X_5 -Experience in Dairy farming, X_6 -Monthly Household Gross Income, X_7 -Monthly Total Expenditure, X_8 -Herd Size, X_9 -Fully involvement of Male members, X_{10} -Fully involvement of Female members, X_{11} -Partly involvement of Male members, X_{12} -Partly involvement of Female members and X_{13} -Age group head of Dairy Households.

Conclusion:-

From the above ANOVA, it can be ascertained that the value of the calculated F is 173.382 for the variance generated by the regression. This means that a significant influence of multiple regression models occurs over the dependent variables. From the above table it can be depicted that the Monthly Households Gross Income ($t=3.837$, $P=0.000$), fully involvement of Male members ($t=20.725$, $P=0.000$) are significant at 1% level. The other predictors have no significant impact on monthly Milk production in the surveyed Dairy farms.

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