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Feeding practices envisaged in Small scale dairy production system and its influence on milk productivity with reference to North Malabar Region of Kerala State. An analytical study

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ABSTRACT

India ranks first in milk production, accounting for 18.5 % of world milk production, achieving an annual output of 146.3 million tones during 2014-15 as compared to 137.69 million tonnes during 2013-14 recording a growth of 6.26 %. (The Economic Survey 2015-16) Indian dairy sector owes its success to the millions of small scale dairy entrepreneurs who had 1 to 3 Milch animals yielding 3-5 liters of milk per day. This study is a cross sectional survey carried out by means of a structured questionnaire covering 501 dairy entrepreneurs of north Malabar region of Kerala, comprising of Kasergode, Kannur, Kozhikode, Wayanad district.501 respondents were randomly selected with 125 samples from each district. The paper examines the significance of scientific feeding of dairy animals to improve the milk productivity thereby enhancing the profitability of dairy entrepreneurs. The information gathered in this paper includes, various feeding practices envisaged by dairy farmers including number of dairy animals reared, total quantity of milk produced per day, earnings through sale of milk, expenditure on feed and fodder, feeding time and feeding frequency. The paper presents the correlation between various variables like number of dairy animals and expenditure on feed and fodder for which the correlation is .263 with a corresponding p value of .000. The correlation between quantity of milk produced per day and expenditure on feed and fodder is .428 with a corresponding p value of .000,likewise the correlation between approximate profit generated from dairy enterprise and number of dairy animals is.150.Additionally the correlation between approximate profit generated from dairy enterprise and expenditure on feed and fodder is .303 with a corresponding p value of .000. The present study was an attempt to describe various feeding practices of small holders livestock production system and were subjected to statistical analysis to establish the extent to which each factor is related to each other and affected milk production and earnings of dairy farmers.

Key words: Feeding practice, Dairy animals, Milk productivity

I.INTRODUCTION

The Food and Agriculture Organization (FAO) has reported a 3.1 % increase in world milk production from 765 million tones in 2013 to 789 million tones in 2014.The per capita availability of milk in India has increased from 176 grams per day in 1990-91 to 322 grams per day by 2014-15. It is more than the world average of 294 grams per day during 2013. This represents a sustained growth in availability of milk and milk products for the growing population Dairying has become an important source of income for millions of rural households engaged in agriculture (The Economic Survey 2015-16) . The distribution patterns of income and employment show that small farm households hold more opportunities in livestock production. The growth in livestock sector is demand-driven, inclusive and pro-poor. Incidence of rural poverty is less in states like Punjab, Haryana, Jammu & Kashmir, Himachal Pradesh, Kerala, Gujarat, and Rajasthan where livestock accounts for a sizeable share of agricultural income as well as employment. Empirical evidence from India as well as from many other developing countries suggests that livestock development has been an important route for the poor households to escape poverty. The dairy development in India offers a unique advantage over industrial development or agricultural development. The spread effect of dairy development is noteworthy because it is more evenly distributed than either agricultural development or industrial development. Dairy development programmes mainly benefit the weaker sections of society. Most of the cultivating households, irrespective of the size of their land holdings, own some milch animals or the other. (Singh,S.R. and Datta,K.K.2010).

The dairy animals can easily be maintained on the crop residues, on weeds, green grass etc. The largest input, however, is the intensive use of family labour. It is abundantly available because of lack of alternative employment opportunities for the rural population except during the sowing and harvesting seasons (M S Bedi1988)

1.1 Animal husbandry is an integral component of Indian agriculture supporting livelihood of more than two-thirds of the rural population. Animals provide nutrient-rich food products, draught power, dung as organic manure and domestic fuel, hides & skin, and are a regular source of cash income for rural households. They are a natural capital, which can be easily reproduced to act as a living bank with offspring as interest, and an insurance against income shocks of crop failure and natural calamities. Sustained income and economic growth, a fast-growing urban population, burgeoning middle income class, changing lifestyles, increasing proportion of women in workforce, improvements in transportation and storage practices and rise of supermarkets especially in cities and towns are fuelling rapid increases in consumption of animal food products. demand foremilk is expected to increase to 141 million tons and for meat, eggs and fish together to15.8 million tons. (Birthal,P,S.,and A.K Jha.2005). The distribution patterns of income and employment show that small farm households hold more opportunities in livestock production. The growth in livestock sector is demand-driven, inclusive and pro-poor. Incidence of rural poverty is less in states like Punjab, Haryana, Jammu & Kashmir, Himachal Pradesh, Kerala, Gujarat, and Rajasthan where livestock accounts for a sizeable share of agricultural income as well as employment. Empirical evidence from India as well as from many other developing countries suggests that livestock development has been an important route for the poor households to escape poverty. (Devendra,C.2007)

1.2 The cross breed animals had significantly high yield compared to its dam, however it required better rearing management and health monitoring as their susceptibility towards metabolic diseases were comparatively high and had a minor incompatibility with the tropical humid climatic condition (Perkio-Makela.M and Hentila.H 2005).(Anjani kumar.,and Gupta,J.N.1997). So to overcome this inadequacy and to provide better health care facility to these animals, various veterinary institutions were set up in blocks and subsequently to every Panchayat in Kerala under the aegis of the state Government. There is also a massive migration of people from dairy sector due to drop in profitability since the sector is becoming unviable due to multiple reasons and the impact of productivity factors affecting profitability is a major factor among them, hence it necessitate to understand, why the fewer number of people were able to generate profit while majority of people in this sector is unable to meet both the ends, even though demand of milk is showing an ascending trend. This is to understand the essential determinants of milk productivity especially the feeding practices, influencing profitability of dairy farmers so as to make this sector more productive and profitable thereby improving the earning as well the living standard of dairy entrepreneurs.

II.MATERIALS AND METHODS

The study was conducted among randomly selected 500 dairy farmers to determine the relationship between earning through sale of milk with the quantity of milk produced per day in small holders livestock production system and the study was undertaken from May 2014 to June 2016 with a pre-tested structured questionnaire having a reliability score of .890 with Cronbach's Alpha. The questionnaire was designed to gain insight regarding the feeding practices adopted by dairy farmers of small holders livestock production system in the North Malabar Region consisting of Kasargode, Kannur, Kozhikode and Wayanad. The study was conducted, within North Malabar Region of Kerala state . The data were analysed by the application of statistical tools like correlation, and crosstabs. 125 samples will be selected by simple random sampling from each district and the total sample was 500 samples of dairy farmers representing North Malabar Region of Kerala state.

2.1 Research instrument used A structured questionnaire and personal interview method will be used for collecting primary data from the dairy farmers.

2.2 Scaling technique used Likert 5 point scale technique for quantifying the various qualitative aspects of study will be used. Bapai,N.(2015). **Tools of analysis** For the measurement and analysis of the information gathered, appropriate statistical tools will be used with SPSS software for establishing conclusions,along with simple statistical tools such as percentage,,,mean, mode , median and ration analysis.

III.RESULTS AND DISCUSSION

Research on the subject has mostly focused on the importance of different feeding practices adopted by dairy entrepreneurs of small scale dairy farms by formulating and statistically testing below mentioned five hypotheses.

3.1 HYPOTHESES:

$H_{0\,1}$: There is no statistically significant relationship between number of dairy animals and expenditure on feed and fodder

$H_{0\,2}$: There is no statistically significant relationship between quantity of milk produced per day and expenditure on feed and fodder

$H_{0\,3}$: There is no statistically significant relationship between quantity of milk produced per day and expenditure on loan repayment

$H_{0\,4}$: There is no statistically significant relationship between earning through sales of milk and feeding frequency.

$H_{0\,5}$: There is no statistically significant relationship between fodder crops and earning through sales of milk

TABLE NO 1: CORRELATION ANALYSIS BETWEEN DIFFERENT VARIABLES INFLUENCING MILK PRODUCTIVITY IN SMALL SCALE DAIRY ENTERPRISES

		NUMBER OF DAIRY ANIMALS	QUANTITY OF MILK PRODUCED PER DAY	EXPENDITURE ON FEED AND FODDER
NUMBER OF DAIRY ANIMALS	Pearson Correlation	1	.657**	.263
	Sig. (2-tailed)		.000	.000
QUANTITY OF MILK PRODUCED PER DAY	Pearson Correlation	.657**	1	.428**
	Sig. (2-tailed)	.000		.000
EXPENDITURE ON FEED AND FODDER	Pearson Correlation	-.063	.428**	1
	Sig. (2-tailed)	.159	.000	
EXPENDITURE ON LOAN REPAYMENT	Pearson Correlation	-.100*	-.039	-.023
	Sig. (2-tailed)	.025	.381	.608

Source: Primary data

TABLE NO 2.CORRELATION ANALYSIS BETWEEN VARIOUS VARIABLES INFLUENCING PRODUCTIVITY OF SMALL SCALE DAIRY ENTERPRISE.

		EARNING THROUGH SALES OF MILK	FEEDING OF DAIRY ANIMALS	FEEDING FREQUENCY
EARNING THROUGH SALES OF MILK	Pearson Correlation	1	.[a]	.175**
	Sig. (2-tailed)		.	.000
FEEDING FREQUENCY	Pearson Correlation	.175**	.[a]	1
	Sig. (2-tailed)	.000	.	
FODDER CROPS	Pearson Correlation	.121**	.[a]	-.019
	Sig. (2-tailed)	.007	.	.669
NUMBER OF DAIRY ANIMALS	Pearson Correlation	.322**	.[a]	.067
	Sig. (2-tailed)	.000	.	.135
QUANTITY OF MILK PRODUCED PER DAY	Pearson Correlation	.646**	.[a]	.070
	Sig. (2-tailed)	.000	.	.117

Source: Primary data

TABLE NO 3.CORRELATION BETWEEN PROFIT GENERATED FROM DAIRY ENTERPRISE AND EXPENDITURE OF FEED AND FODDER

		Approximate profit generated from dairy enterprise	EXPENDITURE ON FEED AND FODDER
Approximate profit generated from dairy enterprise	Pearson Correlation	1	.303**
	Sig. (2-tailed)		.000

Source: Primary data

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TABLE NO 4: CORRELATION ANALYSIS BETWEEN PROFIT GENERATED AND FEEDING OF ADDITIONAL FEED SUPPLEMENTS TO ANIMALS

		Approximate profit generated from dairy enterprise	FEEDING OF ADDITIONAL FEED SUPPLIMENTS/ANIMAL
Approximate profit generated from dairy enterprise	Pearson Correlation	1	.150**
	Sig. (2-tailed)		.001
FEEDING OF ADDITIONAL FEED SUPPLIMENTS/ANIMAL	Pearson Correlation	.150**	1
	Sig. (2-tailed)	.001	

Source: Primary data.

TABLE NO 5: FREQUENCY TABLE DEPICTING VARIOUS PARAMETERS INFLUENCING MILK PRODUCTIVITY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	TWICE	57	11.4	11.4	11.4
	THRICE	419	83.6	83.6	95.0
	MANY TIMES	25	5.0	5.0	100.0

Source: Primary data

TABLE NO 6: FREQUENCY DEPICTING THE FEEDING TIME OF DAIRY ANIMALS

	Frequency	Percent	Valid Percent	Cumulative Percent
MORNING,EVENING,NIGHT	398	79.4	79.4	79.4

	MORNING AND EVENING	6	1.2	1.2	80.6
	MORNING AND NIGHT	97	19.4	19.4	100.0
	Total	501	100.0	100.0	

Source: Primary data

TABLE NO 7: FREQUENCY TABLE OF FEEDING OF DAIRY ANIMALS DURING MILKING AND FEEDING AFTER MILKING OF DAIRY ANIMALS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	DURING MILKING	213	42.5	42.5	42.5
	AFTER MILKING	288	57.5	57.5	100.0
	Total	501	100.0	100.0	

Source: Primary data

TABLE NO 8: FREQUENCY TABLE SHOWING THE FEEDING OF MINERAL MIXTURES TO DAIRY ANIMALS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NIL	76	15.2	15.2	15.2
	50 TO 100 GMS	371	74.1	74.1	89.2
	ABOVE 100 GRAMS	54	10.8	10.8	100.0
	Total	501	100.0	100.0	

Source: Primary data

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TABLE NO 9: A CROSS TABULATION BETWEEN LAND HOLDING AND FODDER CROPS

		FODDER CROPS			Total
		NIL	BELOW 10 CENTS	11 CENTS TO 50 CENTS	
LAND HOLDING	NIL	102	0	0	102
	BELOW 10 CENTS	227	0	0	227
	11 CENTS TO 50 CENTS	49	4	6	59
	51 CENTS -100 CENTS	112	1	0	113
Total		490	5	6	501

Source: Primary data

TABLE NO 10 :EARNING THROUGH SALES OF MILK

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2001 to 5000/month	5	1.0	1.0	1.0
	5001 to 10000/month	49	9.8	9.8	10.8
	10001 to 25000/month	281	56.1	56.1	66.9
	above 25001/month	166	33.1	33.1	100.0
	Total	501	100.0	100.0	

Source: Primary data

TABLE NO:11 EXPENDITURE ON FEED AND FODDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	below 2000/month	22	4.4	4.4	4.4
	2001 to 5000/month	200	39.9	40.0	44.4
	5001 to 10000/month	215	42.9	43.0	87.4

10001 to 25000/month	63	12.6	12.6	100.0
Total	500	99.8	100.0	

Source: Primary data

IV.CONCLUSIONS

As per table no 1, the correlation between number of dairy animals and expenditure on feed and fodder is .263 with a corresponding *p* value of .000 is less than .05 the null hypothesis hence is rejected and it is concluded that there is positive relationship between the two variables The correlation between quantity of milk produced per day and expenditure on feed and fodder is .428 with a corresponding *p* value of .000 is less than .05 the null hypothesis is rejected and it is concluded that there is positive relationship between the two variables The correlation between quantity of milk produced per day and expenditure on loan repayment is -.039 with a corresponding *p* value of .000 is less than .05 the null hypothesis is rejected and it is concluded that there is negative relationship between the two variables.The results of correlation analysis summarized in table number 1 shows a positive correlation between number of dairy animals and quantity of milk produced with a moderately high strength of .657.this finding is in close resemblance with the findings of (Gladwin, C. H., and McMillan, D. 1989).similarly it is observed that there is positive correlation between expenditure on feed and fodder with quantity of milk produced with a strength of .428 as the p value is less than .05 the null hypothesis is rejected. As mentioned by (Ahonan,E.,Venalainen.J.M .and Klenk .T.1990) the profitability reasonably relies too heavily on reducing the expenditure on concentrated feed and fodder and focusing more on feeding naturally and cultivated grasses. As expected it is evidently seen that a positive correlation with a strength of .608 is observed between expenditure on feed and fodder with the expenditure on loan repayment. This could be attributed to more number of animals owned by dairy entrepreneurs and its dependency of commercially available feed and fodder compounded with farmers attitude of availing loan for dairy purpose. Our findings as per table no 3 shows that the approximate profit generated from dairy enterprises is positively correlated with expenditure on feed and fodder with correlation value of .303 and *p* value of .000 thereby rejecting the null hypothesis.It is an evidence to suggest that an increase in expenditure of feed and fodder might be leading to balanced feeding thereby increase in milk production of dairy animals and profitability. This conclusion appears to support the findings of Gladwin, C. H., and McMillan, D. (1989). Table no 5 suggest that majority of dairy farmers as high as 83.6 percent feed their animals three times in a day. 398 dairy entrepreneurs resort to morning, evening and night schedule of feeding as per table no 6. Our investigation so far has been on small scale dairy production system and the study as per table no 8 suggest that 74.1 percent of farmers provide additional feed supplements in the form of mineral mixture ranging from 50 to 100 gms per day to their animals and 10.8 percent provide above 100 Gms per day.As per the table number 9 the percentage of dairy farmers adopting fodder cultivation additionally as per table no 10 33.3 percent of dairy farmers were earning above rupees 25000/ month through sales of milk,56 percent were earning in between 10000/ to 25000/ and only 5 percent were earning between 2000/ to 5000/ Month. The wide range in earning can be attributed to difference

in the number of animals in the farm and the level of management skill adopted by different dairy entrepreneurs. Table no 11 shows the level expenditure on feed and fodder with majority of 42.9 percent spending in between 5000/ to 10000/ per month and 12.6 percent spending in between 10000/ to 25000/ per month on feed and fodder. The current study was limited to North Malabar region of Kerala state comprising five districts, moreover the current study was limited to small scale dairy farms including household dairy enterprises. Large commercial dairy farms were not investigated in this study. hence the observation might not be transferable to large commercial dairy farms or generalized to other geographical area.

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