Economic Analysis of Milk Production With Special Reference to Lucknow District

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Abstract

India is an agriculture based economy and rural area is around 70% engaged in agriculture or dairy sector .Dairy contributes 38%in GDP 2016 and is the second largest in milk production .The paper focus on actual income increment in grassroot level population engaged in dairy sector which is directly or indirectly depends upon economic analysis in milk production to determine cost as well as income generated through this sector which is the backbone of Indian economy being source of non-seasonal employment .

Keywords: Dairy Industry, consumption of fodders and its cost ,health treatment cost, labour cost both hired and family labour involved and overall economic analysis both Expenditure incurred and total income .

1.1Introduction

India is an agricultural economy as more than 70% land are in rural areas according to Census 2011 and share of employment in agriculture 48.9% and more than 58% of population dependent on agriculture as per Economic Survey the sector share 17% in GDP 2017-18 and being agro-based nation has 6 rank in global scenario .Dairy alone contributing 15% of the Gross National Income dairy farming which is the life line and back bone of India's economy in the form of income, employment and foreign exchange earnings. Dairy alone contributing 15% of the Gross National Income (Raju,2001).The growth of livestock sector is much more faster (6 to 8%)than core agriculture sector (2.3%).Dairy itself has a growth of 5 to 6%per annum. In global scenario India is the topmost in milk production.

Dairy Farming from being a traditional family run businesses ,today has grown hugely to an organized dairy industry with technological specializations in every part of the process .We have seen tremendous growth in dairy farming equipment that help modern dairy farms to manage thousands of dairy cows and buffaloes .This

huge boost in the industry has created a lot of farming jobs for the people. But many of the dairy farms still manage and run organic dairy farms mostly in villages and supply the milk to get processed by large companies and finally sell to the retail outlets. Anyone opting to go in for dairy farming must have a genuine love for the welfare of cows and buffalo as dairying requires long hours of tiring and harsh work without there being any holiday. Further to be a successful dairy farmer must have a good knowledge about all aspects of scientific management of dairy animals as well as management of dairy business. The selection, breeding, feeding, management ,housing and healthcare requirements of high grade crossbreed cows and genetically superior buffaloes are different in many respects from our traditional methods of cattle rearing.

The best approach is to create and run a sustainable and minimizing cost of milk production that gives maximum profits to the firm and also takes care of the effects of dairy farms on environment and animals for a longer period.

Milk Production depends on Breed ,Feeds and health of cattle. The economics analysis of Milk production deals with the expenditure associated in milk production includes feeding of fodders, Health treatment, shedding, values of cattle, labours involved in dairy farming practices (hired or family members) ,management practices , artificial insegmentation , vaccines and miscellaneous expenditure incurred in milk production as well as income from dung cakes and sell of milk.

1.2 Review of Literature:

- *MM Uddin,MM Sultana,T Hemme and KJ Peters(Dept of Animal Breeding in Tropic & Sub Tropics,Humboldt University of Berlin,Germany)* Problem high inputs and low output prices that dairy farmer needs adapt intensive and technology which can ultimately reduce cost to improve on productivity and farm profits by using TIPI-CAL(Technology Impact Policy Impact Calculation).

- *Dhanabalan. M. (2009)*highlights that dairy has an important role in improving the overall economic conditions of rural India. To maintain the ecological balance, there is need for sustainable and balanced development of agriculture and allied sectors. From our first plan onwards, planners have given priority to allied sector for the economic development of the rural sector. Dairy farming is described as a small industry which provides gainful employment opportunities. It comprises of about six per cent of the national income

- *Reddy Y.V.R (2006*)highlights existence of complementary and supplementary relationship between crop production and animal production systems,dairy has gained mercialization and it is a rural income generating activity in India.Agriculture enterprise has not provided constant employment to rural people but dairy has not only provided gainful employment but also assured regular income . The national income from animal husbandry has increased from 3%in 1950 to 25% in 2003 in GDP. Hence it is necessary to know the cost of structure and profitability and sustainability of Dairy to formulate policies for developing animal husbandry in India with reference to Dairying which has high adaptability, feasibility, acceptability, profitability and sustainability in rural India.

- *Perumal.M* The book enlightened cattle rearing as secondary occupation which provided highest employment opportunities. The Government of India has launched Operation Flood –I, II and III to increase the yield /output from animals. It narrate the problem of maintaining milch animals and also suggests certain policy recommendations to improve the income distribution in India.

1.3Global Scenario of Milk Production

World Milk Production

USA	91.3 Billion kg
India	60.6 Billion kg
China	35.7 Billion kg
Brazil	34.3 Billion kg
Germany	31.3 Billion kg
Russia	30.3 Billion kg
France	23.7 Billion kg
New Zealand	18.9 Billion kg
Turkey	16.7 Billion kg
UK	13.9 Billion kg

Source: World Dairy Products

World Milk Consumption

India	66,800
EU	33,300
US	22,200
China	12,700
Brazil	9,749
Russia	8,300
Ukraine	4,855
Mexico	4,183
Japan	3,980
Canada	2,890

Source:USDA Foreign Agriculture service

India's Production and per capita availability (gms/day)

year	production(million tonnes)	per capita availability (gms/day)
2010-11	121.8	281
2011-12	127.9	290
2012-13	132.4	299
2013-14	137.7	307
2014-15	146.3	322
2015-16	155.5	337
2016-17	165.4	355
2017-2018	176.3	375

Source:Dpt of Animal Husbandry, Dairying and fisheries, Ministry of Agriculture and farmers

Topmost Indian state in milk production

state	2015-16	2016-17
Uttar Pradesh	23330	24194
Rajasthan	13946	14573
Gujarat	10315	11112
Punjab	9724	10011

Source:Dpt of Animal Husbndry, Dairying and fisheries, Ministry of Agriculture and farmers

Cost of milk /l in India around Rs46.29 lies between Rs40 to 56.

Source: https://www.numbeo.com/cost-of-living/country_result.jsp?country=India

1.4Challenges associated in Milk production:

i. Small dairy farms as majority of dairy animals kept by small and marginal farmers with lack of capital and number of cattle vary from 1 to 5 per farm.

ii. Feeding of animals as they are not aware of how much and what to be feed to animals and supplement feeding is limited.

iii. Health issues due to lack of veterinarians in rural areas, frequent disease incidence like FMD which affect production of milk ,absence of preventive health care like vaccination and de-worming .

iv. Lack of hygienic shed as small and marginal farmers left their cattle free or without shed, dis-infestation of animal shed regularly.

v. Farmers are not aware of maintaining proper records and dairy farm economics so it is quite difficult to analysis what actual cost of production attained hence, they are not aware how to minimize cost.

vi. Lack of cold storage and transportation cost as milk is perishable.

2.1 Objectives

i. To study the present status and pattern of breeding,feeding ,healthcare and management practices followed in milk production .

ii. To assess the income and expenditure in milk production.

iii. To assess the cost of milk production.

iv. To study in minimizing the cost of milk production.

2.2 Hypothesis

1) H_0 -There is no significant relation between income and cost of milk production.

H_1 -There is significant relation between income and cost of milk production.

2) H_0 -There is no significant relation between feeding of fodders and cost of milk production.

H_1 -There is significant relation between feeding of fodders and cost of milk production.

3) H_0 -There is no significant relation between labour employ and cost of milk production.

H_1 - There is significant relation between labour employ and cost of milk production.

4) H_0 -There is no significant relation between healthcare treatment and cost of milk production.

H_1 - There is significant relation between healthcare treatment and cost of milk production.

2.3Methodology :

Primary data collected to estimate cost of milk production through 30 random sampling of Lucknow district .There are 8 tehsils out of 2 blocks selected Anaurakala, chinhat 15 sample from each block collected by questionnaire method and using excel various statistical tools i.e. regression analysis and correlation. Questionnaire prepared on the basis of land holding, value of cattle purchase, labours involved in production and their time involve in production , Quantity and cost of fodders (green/dry/grass) miscellaneous expenditure and management expenditure and income from dung, income per litre per day and healthcare treatment on vaccines/veterinary/artificial in segmentation costs,etc.

Time of study:

3-4 Months

2.4Limitations of the study:

Due to time and money constraints the fieldwork was carried out only for 3-4 months .People were very concise and suspected to give information for any queries and try to give fake data in the beginning. People were knowingly gave false data because their perception that these information known to everybody in that area as fieldwork is related to income and exp occurred and they didn't put record to show evidence that how much exp incurred in accordance to income attained. If I could spend more time in field work it could have better to get more information but due to coursework I was not in a position to spend much time continuously.
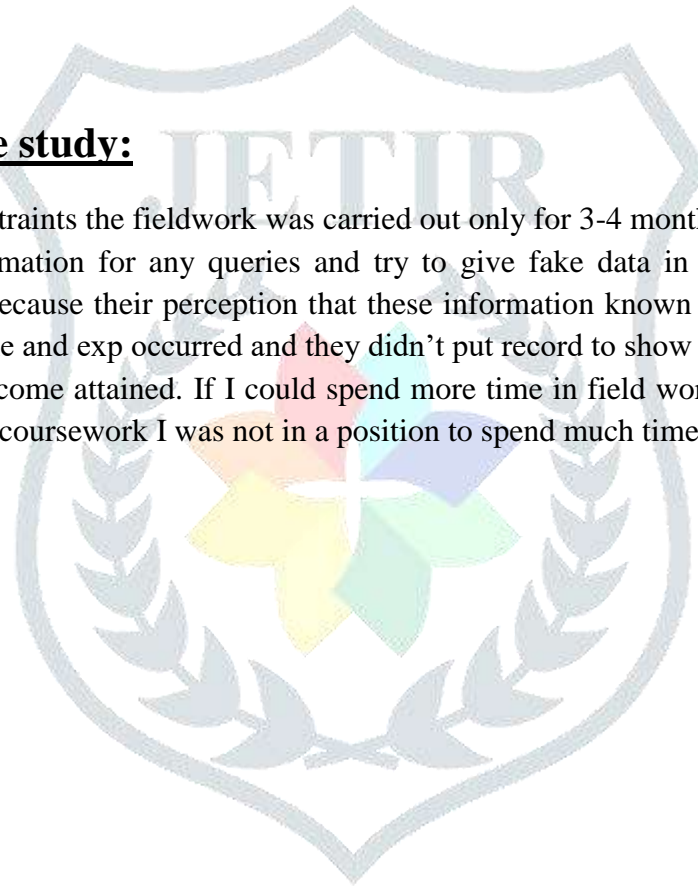
3.1Table 1: Total milk animals : No of cows and no. of buffaloes

milk_animal_no	no_cow	no_buffalo
3	1	2
5	2	3
3	1	2
3	1	2
5	1	4
3	2	1
4	1	3
5	2	3
2	1	1
3	2	1
4	1	3
3	1	2
4	2	2
5	2	3
2	0	2
2	1	1
5	2	3
3	1	2
6	3	3
6	2	4
3	1	2
4	1	3
6	2	4
4	2	2
2	2	0
2	0	2
4	2	2
6	2	4
3	1	2

3.2Table2 : Milch animal and dry animals

milch_animal	dry_animal
2	1
3	2
2	1
2	1
2	3
1	2
3	1
2	3
2	0
2	1
2	1
1	2
3	1
2	2
1	1
2	0
4	1
2	1
4	2
3	3
2	1
3	1
3	3
2	2
2	0
1	1
2	2
4	2
2	1
1	0
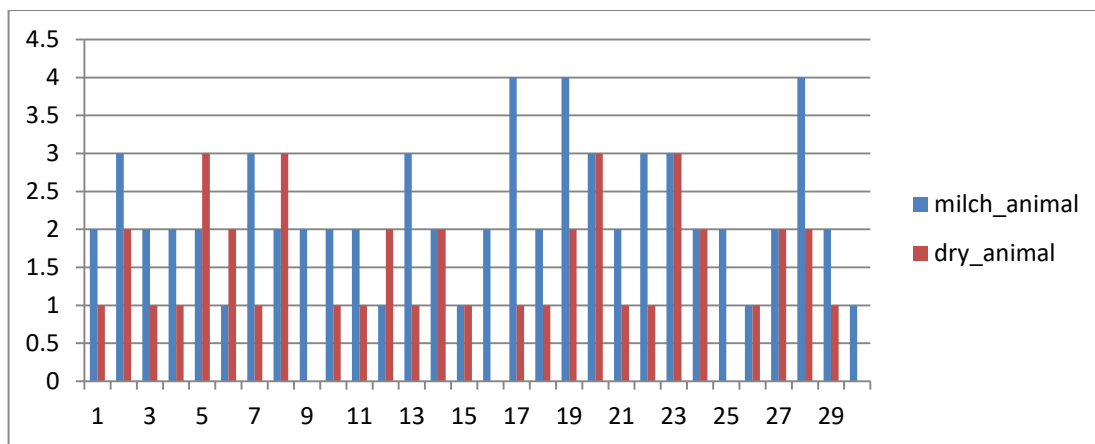
3.3 Table 3: Total exp inccurred in milk production

cattle value	Fodders exp	Labourhire exp	Family labour exp	health	manage	misc	total exp
2lac	0	0	750	12000	0	0	212,750
2.5lac	3600	250	1000	16000	12000	6000	284350
90000	3600	0	1500	18000	0	0	109870
90,000	1650	500	1250	11000	12000	8000	122805
4.5lac	1650	500	1500	12000	10000	6000	480050
90000	1650	0	1500	10000	12000	0	122805
2lac	3600	0	1250	13000	0	0	214370
4.5lac	3600	750	1750	14000	20000	8000	494620
1.5lac	0	500	1500	15000	12000	6000	187000
90000	0	250	1250	11000	10000	6000	118500
90000	1650	0	1000	12000	0	0	103055
90000	1650	500	750	14000	12000	6000	123305
2.5lac	3600	250	1250	13000	10000	8000	282620
4.5lac	1650	500	500	12000	12000	6000	483305
1lac	3600	0	1000	10000	0	0	111120
1.5lac	0	0	500	10000	0	0	160500
4.5lac	3600	750	750	16000	20000	8000	495620
2lac	1650	500	750	12000	12000	6000	231255
4.5lac	3600	750	1000	16000	20000	8000	495620
4.5lac	3600	750	1250	16000	12000	8000	488120

2.5 lac	1650	250	500	10000	12000	6000	278805
2.5lac	1650	500	1000	13000	10000	8000	282305
4.5lac	3600	750	500	12000	12000	6000	481370
4lac	1650	500	1000	10000	12000	8000	431555
2lac	0	0	1000	10000	0	0	211000
2lac	1650	0	1250	16000	0	0	217305
4lac	3600	500	750	12000	12000	6000	431370
4.5lac	3600	750	1250	10000	20000	8000	480120
1.5lac	120	500	1500	12000	20000	6000	190120
90000	0	0	1250	10000	0	0	101250
Average90000	61470	350	1066.7	12600	9467	4600	280,895

3.4Table 4: consumption and cost of fodders and its impact on Total exp inccurred in milk production

consump_fodders	cost_fodders	total exp
5-8 grass	0	212,750
10-15dry fodders	3600	284350
10-15 dry fodders	3600	109870
8-11green fodders	1650	122805
8-11green fodders	1650	480050
8-11 green fodders	1650	122805
10-15 dry fodders	3600	214370
10-15 dry fodders	3600	494620
5-8 grass	0	187000
5-8 grass	0	118500
8-11grass fodders	1650	103055
8-11grass fodders	1650	123305
10-15dry fodders	3600	282620
8-11green fodders	1650	483305
10-15dry fodders	3600	111120
5-8grass	0	160500
10-15 dry fodders	3600	495620
8-11grass fodders	1650	231255
10-15 dry fodders	3600	495620
10-15 dry fodders	3600	488120
8-11green fodders	1650	278805
8-11green fodders	1650	282305
10-15 dry fodders	3600	481370
8-11green fodders	1650	431555
5-8grass	0	211000
8-11green fodders	1650	217305
10-15 dry fodders	3600	431370
10-15 dry fodders	3600	480120
10-15 dry fodders	120	190120
5-8 grass	0	101250
Average	2049	280,895

Grass consumed free from the ground zero marginal cost

Green fodders 8-12Rs/kg

Dry fodders 5-8Rs/kg

3.5Regression Analysis: Total exp on y and cost of fodders on x-axis.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.514813
R Square	0.265033
Adjusted R Square	0.238784
Standard Error	1250.036
Observations	30

ANOVA

	df	SS	MS	F	Significance F
Regression	1	15777358	15777358	10.09693	0.003604
Residual	28	43752512	1562590		
Total	29	59529870			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	677.5865	488.2195	1.387873	0.176122	-322.486	1677.659	-322.486	1677.659
X Variable 1	0.004882	0.001536	3.177567	0.003604	0.001735	0.00803	0.001735	0.00803

Result:

p-value =0.003 which is less than 0.05 we reject null hypothesis (H_0) as there is no difference between the means and significant difference exist .

Hence, there is acceptance of (H_1) and conclude that there is no significant difference between total cost of fodders and total exp occurred in milk production.

There is a significant linear relationship between total cost of fodders and total exp occurred because correlation coefficient is significantly different from zero.

3.6Table 5: Health treatment cost and its impact on Total exp occurred in milk production

healthcare_cost	total exp
12000	212,750
16000	284350
18000	109870
11000	122805
12000	480050
10000	122805
13000	214370
14000	494620
15000	187000
11000	118500
12000	103055
14000	123305
13000	282620
12000	483305
10000	111120
10000	160500
16000	495620
12000	231255
16000	495620
16000	488120
10000	278805
13000	282305
12000	481370
10000	431555
10000	211000
16000	217305
12000	431370
10000	480120
12000	190120
10000	101250
Average 12600	280,895

3.7Regression Analysis: Total exp on y and health treatment cost on x-axis.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.20143
R Square	0.040574
Adjusted R Square	0.006309
Standard Error	2335.599
Observations	30

ANOVA

	df	SS	MS	F	Significance F
Regression	1	6459414	6459414	1.184123	0.285796
Residual	28	1.53E+08	5455021		
Total	29	1.59E+08			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	11722.5	912.2017	12.85078	2.91E-13	9853.938	13591.06	9853.938	13591.06
X Variable 1	0.003124	0.002871	1.088174	0.285796	-0.00276	0.009005	-0.00276	0.009005

Result:

p-value =0.285 which is greater than 0.05 we accept null hypothesis (H_0) as there is difference between the means and significant difference exist .

Hence, there is acceptance of (H_0) and conclude that there is significant difference between total Health treatment and total exp occurred in milk production.

There is a significant linear relationship between health treatment and total exp occurred because correlation coefficient is not significantly different from zero.

3.8Table 6 : No. of labour hired and no. of family members involved and their cost and its impact on total exp occurred in milk production.

| labour_hired	no.of family labour	cost_labour_hired per month	cost family_labour per month	Total labour cost per month	total exp
0	3	0	750	750	212,750
1	4	250	1000	1250	284350
0	6	0	1500	1500	109870
2	5	500	1250	1750	122805
2	6	500	1500	2000	480050
0	6	0	1500	1500	122805
0	5	0	1250	1250	214370
3	7	750	1750	2500	494620
2	6	500	1500	2000	187000
1	5	250	1250	1500	118500
0	4	0	1000	1000	103055
2	3	500	750	1250	123305
1	5	250	1250	1500	282620
2	2	500	500	1000	483305
0	4	0	1000	1000	111120
0	2	0	500	500	160500
3	3	750	750	1500	495620
2	3	500	750	1250	231255
3	4	750	1000	1750	495620
3	5	750	1250	2000	488120
1	2	250	500	750	278805
2	4	500	1000	1500	282305
3	2	750	500	1250	481370
2	4	500	1000	1500	431555
0	4	0	1000	1000	211000
0	5	0	1250	1250	217305
2	3	500	750	1250	431370
3	5	750	1250	2000	480120
2	6	500	1500	2000	190120
0	5	0	1250	1250	101250
Average		350	1066.666667	1416.666667	280,895

3.9 Regression Analysis: Labour cost involved both hired and family labours on y and Total exp on x axis.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.387973
R Square	0.150523
Adjusted R Square	0.120184
Standard Error	419.1781
Observations	30

ANOVA

	df	SS	MS	F	Significance F
Regression	1	871778.1	871778.1	4.961451	0.034133
Residual	28	4919889	175710.3		
Total	29	5791667			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1094.297	163.7161	6.684115	2.97E-07	758.9398	1429.654	758.9398	1429.654
X Variable 1	0.001148	0.000515	2.227431	0.034133	9.22E-05	0.002203	9.22E-05	0.002203
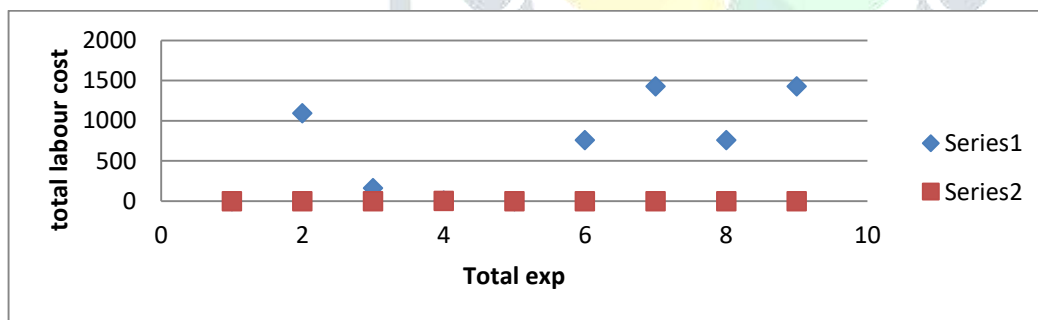
Result:

p-value =0.002 which is less than 0.05 we reject null hypothesis (H_0) as there is no difference between the means and no significant difference exist .

Hence, there is acceptance of (H_1) and conclude that there is no significant difference between total labour cost and total exp occurred in milk production.

There is a significant linear relationship between labour cost and total exp occurred because correlation coefficient is significantly different from zero.

3.10Table 7 :Total income per month and total exp occurred in milk production.

total income	total exp
57000	212,750
98250	284350
67350	109870
69000	122805
57000	480050
51000	122805
109500	214370
81000	494620
75000	187000
50850	118500
38850	103055
30250	123305
76000	282620
72750	483305
34350	111120
54600	160500
109500	495620
75000	231255
99000	495620
66000	488120
69000	278805
78750	282305
116700	481370
59250	431555
34350	211000
34350	217305
75000	431370
103500	480120
87750	190120
34350	101250
Average 68841.66667	280,895

3.11Regression Analysis : Total Exp on y and Total Income on x-axis.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.5817
R Square	0.338375
Adjusted R Square	0.314746
Standard Error	20468.96
Observations	30

ANOVA

	df	SS	MS	F	Significance F
Regression	1	6E+09	6E+09	14.32006	0.000747
Residual	28	1.17E+10	4.19E+08		
Total	29	1.77E+10			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	42098.1	7994.445	5.265918	1.34E-05	25722.22	58473.97	25722.22	58473.97
X Variable 1	0.095209	0.02516	3.784186	0.000747	0.043671	0.146746	0.043671	0.146746

Result:

p-value =0.0007 which is less than 0.05 we reject null hypothesis (H_0) as there is no difference between the means and no significant difference exist .

Hence, there is acceptance of (H_1) and conclude that there is no significant difference between total income and total exp occurred in milk production.

There is a significant linear relationship between total income and total exp occurred because correlation coefficient is significantly different from zero.

4.1Conclusion:

This study begins with review of economic evaluation of milk production as India is topmost in milk production globally and contribute 38% approx in GDP growth so , it is quite important to analyse income attain at grassroot population who involved in dairy farming how much they attain surplus with respect to cost of production .Moreover India ¾ population dependent on agriculture or dairy farming it is the source of livelihood for rural people they accept this either main or subsidiary occupation.

Through this work concluded to the point that landholding area plays a vital role to start dairy farming moreover there is huge exp occurred in milk production starting from cattle value –management practices- fodders /feeding-labour involved both hired and family members to miscellaneous exp occurred and income attained from milk per day yeid and income from dung.

After collecting data from 2 blocks i.e. anaurakala and chinhat (15 from each) and doing analyzing it is concluded that huge capital require to start dairy farming as exp involved in questionnaire are important in dairy farming and there is large gap between attaining income and exp in milk production. So, it is essential to cut down cost and make people aware to cut cost of production which leads to profitability of dairy farming.

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