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A Comparative Analysis of the Socio-Economic Status of the Members of Dairy Co-Operatives and Private Dairies in Rajasthan

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ABSTRACT

Rajasthan have a large scale presence of both the private dairy and the dairy co-operatives which is providing infrastructural, Marketing and Service support to the potential dairy sector of the state. Rajasthan is selected purposively for the present study. Two districts namely Jaipur and Alwar had been purposively selected out of 13 Tehsils of Jaipur district & out of 11 tehsils of Alwar district, list of all the Tehsils comprising both private Dairy and Dairy co-operative societies has been prepared out of them 2 tehsils from each district *i.e.* Chomu and Shahpura from Jaipur district and Behror & Tijara from Alwar district were selected randomly. Member of dairy co-operative societies and private dairies were selected by proportionate random sampling method. Thus total 100 members of dairy co-operative societies and 100 members of private dairies were selected. Higher Productivity of milch animals is depends on the higher knowledge and adoption of breeding, feeding, health care and management aspect of the dairy farming practices. Total milk yield in last lactation of crossbred, local cows and buffaloes of the member of private dairy was 1226.86, 914.34 and 1068.98 liters; respectively. While In case of member of dairy co-operatives total milk yield in last lactation of crossbred, local cows and buffaloes was 1326.66, 1133.8 and 1230 liters respectively. Total milk yield in last lactation among the dairy co-operative respondent's animals was found significantly higher than the private dairies. Average milk yield was found to be significantly higher in case of animals of dairy co-operative respondents than the private dairies at 5 % level of probability. Training, dairy extension services, cattle feed, health care services and other dairy development programmes initiated by dairy co-operatives which led to substantial improvement in the milk production of cooperative animals were found to be the major causes behind this difference.

1. Introduction

Despite India's India has around 577 million small holders comprising of landless, small and marginal farmers. 350 million (70 million rural households) farmers keep dairying animals. Out of these households, 75 per cent (52 million households) are small, marginal and landless milk producers. The size of the herds vary from 1 - 2 to about 6 - 8. Among these 52 million small milk producing households, around 13 million are connected with the dairy cooperative institution, in India.

The 13 million small holder dairy farmers, who are connected with the cooperative institutions, are being socio-economically benefited. They are able to supply milk, twice a day *i.e.* in morning & evening and get an assured payment based on the quality of the milk supplied, which helps their daily cash flow. As a part of the package benefits provided by the cooperatives to its producer members, these small holders receive services like artificial insemination, veterinary services, feed supply, and assurance of regular payment, bonus, credit facilities and technical inputs, *etc.*

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Other than the individual member benefits, village community as a whole, in certain progressive cooperatives, which have fully adopted the 'An and Model', are additional being benefited by having roads, schools, hospitals, etc. built out of the surplus generated by the milk cooperatives. The multifaceted extension programmers, as a part of the benefit package, are also causing social engineering to a religiously diverse, multicultural and highly stratified Indian rural society. Thus, in the 'Anand Model' cooperative institutions, milk is being used as a tool for socio-economic development.

2. Materials and Methods

The present study was carried out in the Rajasthan state. The state is purposively selected because Rajasthan is the biggest state in India in terms of total geographical an *i.e.* 3.42 lakh Sq.km. Rajasthan state is having largest computerized dairy cooperative societies after Gujarat in the country. Rank 2nd in milk production after Punjab. Rajasthan contributes nearly 10% of total milk production of the country, Economic Survey of Rajasthan (2010). State Rajasthan is comprised of 32 districts, out of which two districts namely Jaipur and Alwar were purposively selected because Jaipur is maximum milk producing district of Rajasthan. Among dairy cooperatives of Rajasthan, Jaipur & Alwar district co-operative societies were selected because: Jaipur dairy is largest dairy co-operative society with highest membership. Alwar dairy co-operative had second largest membership of dairy cooperative societies. Out of six private dairies operating in Jaipur *viz* Reliance, Paras, Nestle, Gopal, Modern and Lotus, one Reliance was selected randomly. In case of Alwar district, out of four private dairies working in the district *viz* Paras, Gopal, Modern and Lotus, one Modern was selected randomly. Out of 13 tehsils of Jaipur district & out of 11 tehsils of Alwar district, list of all the tehsils comprising both Private Dairy and Dairy co-operative societies had been prepared out of them 2 tehsils from each district *i.e.* Chomu and Shahpura from Jaipur district and Behror & Tijara from Alwar district with highest membership of private dairy had been selected randomly. Member of dairy co-operative societies and private dairies had been selected by proportionate random sampling method. Thus total 100 members of dairy co-operative societies and 100 members of private dairies were selected.

Statistical tools used

(I) Cumulative Cube Root Method

No of Classes K = 1+3.322 Log N

N = Total no observations

Class Interval = (Maximum value-Minimum value)/K
N/K-C

$$QK = L + \frac{\frac{N}{K} - C}{K} \times h$$

Kth Group class will be obtained by looking into N/K in class interval column.

L = Lower limit of the Kth group class.

N = Total frequency

C = Cumulative frequency of the class preceding Kth group class

F = frequency of the Kth group class

h = Width of the class interval

(II) Z-Score

$$z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

Formula:

Where

X₁ and X₂ - means of the two samples,

σ₁ and σ₂ - standard deviations of the two populations

n₁ and n₂ - sizes of the two samples.

(III) Percentage - simple comparison was made on the basis of percentage.

(IV) Mean score- Mean score was obtained by total scores of each statement divided by total number of respondents.

$$\text{Mean score} = \frac{\text{Total score of a practice}}{\text{Total no. of respondents}} \times 100$$

(V) Standard deviation- Mean and standard deviation were used for categorizing the respondents into different categories and to find out the variability of the dependent and independent variables included in the study.

$$\text{Formula} = \frac{\sum x^2 - (\sum x)^2}{N(n)^2}$$

Where,

S.D. = Standard division

Σx² = Sum of squares of

the variables x

Σx = Sum of the values

of the variables x

N = Number of

respondents

(VI) Rank - Ranks were awarded in the descending order- according to the frequencies/Mean Percent Score.

3. Results and Discussions

1. Education. A glance at Table 1 reveals that 15.00% members of private dairy were illiterate followed by those studied up to primary (29.00%), middle (25.00%), metric (10.00%), secondary (15.00%), Graduate (5.00%) and above Graduate(1.00%). Whereas, in case of members of Dairy Co-operatives (35.00%) members were illiterate followed by those studied up to primary (22.00%), middle (18.00) %, metric (13.00%), and secondary (12.00%), Graduate (0.0%) and above Graduate (0.00%).

Table 1. Distribution of the members of Private dairy & dairy Co-operatives according to their education.

S. No.	Education	Score	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Illiterate	0	15	35
2.	Up to primary	1	29	22
3.	Up to middle	2	25	18
4.	Up to metric	3	10	13
4.	Up to secondary	4	15	12
5.	Graduate	5	5	0
6.	Above graduate	6	1	0

Since persons with higher education prefer to go in other occupation and dairying is their secondary choice more over dairying profession require very less level of education because of these reasons most of respondents fell in lower level of education category. Saha (2002), Srilatha (2005) and Sarangi (2006) in their respective studies were reported similar trend *i.e.* higher % of respondent was in illiterate category.

2. Family Size. A perusal of the Table 2 revealed that majority of the member of Private dairy & Dairy Co-operatives (44.00% and 50.00%) belonged to small Family size group, 39.00 % members of private dairy and 25.00% members of dairy co-operative members fell in the medium family size category while 17.00 % members of private dairy and 25.00% members of dairy co-operative members fall in the large family size category. Increased level of education and modernization led to breaking of the bonds of the rural society resulting disintegration of the large and nuclear families into small ones.

Table 2. Distribution of the members of Private dairy & dairy Co-operatives according to their family size.

S. No	Score	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Small (Up to 6)	44	50
2.	Medium (6-15)	39	25
3.	Large(>15)	17	25

The above findings are in contrast to the findings of Meena (2000), Das (2003) , Saha (2002) , Sri Latha (2005) , Sarangi (2006) who found that most the families fell in the medium size group of the families .

3. Land Holding. A perusal of the Table 3 revealed that majority of the member of Private dairy & Dairy Co-operatives (33.00% and 37.00%) belong to small land holding group with 1-2 hectare of land holding size. Nearly, 6.00 % members of private dairy and 9.00% members of dairy Co-operative members fall in the land less category while nearly, 25.00 % members of private dairy and 23.00% members of dairy Co-operative members fall in the marginal land holding category. Nearly, 9.00 % members of private dairy and 8.00% members of dairy Co-operative members fall in the large land holding category. Since most of the large farmers opt for the agricultural and dairying is the best available option for the small and marginal farmers because it require less land as compared to agriculture. The above findings are in contrast to the findings of verma (1993), Srilatha (2005) and Meena (2002) who found that most of the respondents had medium size of land holding.

Table 3. Distribution of the members of Private dairy & dairy Co-operatives according to their Land holding.

S. No	Category	Range	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1	Land less	No land	6	9
2	Marginal	up to 1	25	23
3	small	1-2	33	37
4	Medium	2-4	27	23
5	large	Above 4	9	8

Table 4. Distribution of the members of Private dairy & dairy Co-operatives according to their Occupation.

S. No.	Occupation	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1	Dairying	38	25
2	Agriculture + Dairying	47	54
3	Labour + Service + Ag. + Dairying.	15	21

4. Occupation. Majority of the member of Private dairy & dairy Co-operatives (47.00% and 54.00%) belong to Agriculture +Dairying and 38.00% & 25.00% belong to Dairying respectively while 15.00% and 21.00% belong to Labor + Service + Agriculture +Dairying respectively Since both occupations are complimentary to each other means cow dung can be used as the manure in crops and fodder and other agricultural by product can be used for rearing animals so Agriculture +Dairying is the best option and opted by most of the respondents.

5. Herd Size. Majority of the member of Private dairy & Dairy Co-operatives (47.00% and 51.00%) belonged to medium herd size group ranging from 4-15 .Nearly, 32.00 % members of private dairy and 29.00% members of dairy Co-operative fall in the low herd size category while Nearly, 21.00 % members of private dairy and 20.00% members of dairy Co-operative members fall in the high herd size category. These findings are in conformity with the findings of the verma (1993) Kumar (2001) .

Table 5. Distribution of the members of Private dairy & dairy Co-operatives according to their Herd size.

S.No	Herd size	Range	Percentae of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1	Small	<4	47	51
2	Mediu m	4-15	32	29
3	Large	>15	21	20

Possession of the small heard size led the members to produce the small quantity of the milk only. Saha (2002) reported that milk production was low among majority (77Percent) of the respondents.

However Shrilatha (2005) findings were in contrast with these results that majority of the farmers were maintaining medium herd size. Since most of the memes of the co-operatives and private dairies are the small and marginal farmers so they are capable to maintain small size of the heard only. These findings of the study are in line with the findings of the Khana (1989) who reported that only the large farmers, kept more than 4 animals of cross bred cows and their contribution to total livestock population was merely 15 to 20 percent.

6. Social Participation. Majority of the member of Private dairy & Dairy Co-operatives (40.00% and 43.00%) belong to medium social participation group nearly, 34.00 % members of private dairy and 33.00% members of dairy co-operative members fell in the low social participation category while nearly, 26.00 % members of private dairy and 24.00% members of dairy Co-operative members fell in the High social participation category. Since dairying makes respondents occupied for full time so members could participate in social activities as part time only. These observations are in line with the findings of verma (1993), Saha (2002) and Singh (2006) who found that majority of the farmers Were in medium category regarding social participation.

Table 6. Distribution of the members of Private dairy & dairy Co-operatives according to their social participation.

S.NO	Category	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Low (up to 2)	34	33
2.	Medium (2-6)	40	43
3.	High (>6)	26	24

7. Milk Production. Majority of the member of Private dairy & Dairy Co-operatives (54.00% and 57.00%) belong to low milk production group Nearly, 32.00 % members of Private dairy and 33.00% members of dairy Co-operative members fall in the medium milk Production category while Nearly, 14.00 % members of private dairy and 10.00% members of dairy Co-operative members fall in the High milk production category.

9. Milk Sale. Majority of the member of Private dairy & dairy Co-operatives (40.00% and 50.00%) belong to low milk sale group. Nearly, 35.00 % members of private dairy and 31.00% members of dairy Co-operative members fall in

Table 7. Distribution of the members of Private dairy & dairy Co-operatives according to their Milk production.

S.NO	Litres /day	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Low (Up to 12)	54	57
2.	Medium (12-43)	32	33
3.	High(>43)	14	10

8. Milk Consumption. Majority of the member of Private dairy & Dairy co-operatives (59.00% and 68.00%) belong to low Milk consumption group. Nearly, 32.00 % members of private dairy and 17.00% members of dairy Co-operative members fall in the medium Milk consumption category while Nearly, 9.00 % members of private dairy and 15.00% members of dairy Co-operative members fall in the High Milk consumption category. Verma (1993), Das (2004) and Paul (2008) in their respective studies found that majority of the respondents were in the medium milk consumption category. Since most of the milk is sold in the market so very less milk remain for the consumption purpose. These findings are in line with the findings of the Kumar (1998), Meena (2005), Singh (2006), Prakash (2009) and Sarangi (2006) who reported low to medium level of milk consumption with majority of the milk producer farmers

Table 8. Distribution of the members of Private dairy & dairy Co-operatives according to their milk consumption.

S.NO	Range	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Low(Up to 5)	59	68
2.	Medium (5-11)	32	17
3.	High (>11)	9	15

11. Mass Media Exposure. Majority of the member of Private dairy & Dairy Co-operatives (73.00% and 67.00%) belong to low mass media exposure group. Nearly, 19.00 % members of private dairy and 17.00% members of dairy Co-operative members fall in the medium mass media exposure category. While nearly,

the medium Milk sale category while nearly, 25.00 % members of private dairy and 19.00% members of dairy Co-operatives fell in the high milk sale category. Possession of the small heard size and production of the small quantity of the milk led to the small quantity of the milk sale by the members of the dairy co-operatives and private dairies.

Table 9. Distribution of the members of Private dairy & dairy Co-operatives according to their Milk sale.

S. No.	Category litres /day	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Low(<Up to 12)	40	50
2.	Medium(12-35)	35	31
3.	High(>35)	25	19

10. Extension Contact. Majority of the member of Private dairy & dairy Co-operatives (59.00% and 69.00%) belong to low extension contact group. Nearly, 2.00% % members of private dairy and 5.00% members of dairy Co-operative members fall in the high extension contact category while Nearly, 39.00 % members of private dairy and 36.00 % members of dairy Co-operative members fall in the medium Extension contact category. Lack of awareness and innovativeness accompanied by low education led the members to maintain low extension contacts. These observations are in contradiction with the observations of Das (2004), Singh (2006) and Lal (2007) who found that majority of the respondents had medium extension contact.

Table 10. Distribution of the members of Private dairy & dairy Co-operatives according to their extension contact.

S. No	Score	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Low (Up to 6)	58	59
2.	Medium (6-15)	39	36
3.	High (>15)	3	5

Since most of the farmers being small and marginal farmers keep small heard size which result in Low level of milk production led to low level annual income from dairying. Meena, G.L. (2009) found that with regard to income of the members from the dairying, majority of the members (53.20%) earned up to Rs. 5000 per year and average net

8.00 % members of private dairy and 16.00% members of dairy Co-operative members fall in the High mass media exposure category. Low level of the education and remote location of the farmers led to medium mass media exposure the farmers Verma (1993), Das (2004) and in their respective studies were found similar trends *i.e.* majority of the respondents were in the medium mass media exposure category.

Table 11. Distribution of the members of Private dairy & dairy Co-operatives according to their mass media exposure.

S. No.	Mass Media Exposure	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Low (up to 6)	19	17
2.	Medium (6-12)	73	67
3.	High (>12)	8	16

12. Annual Income from Dairying. Majority of the member of Private dairy & dairy Co-operatives (62.00% and 67.00%) belong to low annual income from dairying group. 30.00 % members of private dairy and 23.00% members of dairy Co-operative members fell in the medium annual income from dairying category while Nearly, 8.00 % members of private dairy and 10.00% members of dairy Co-operative fell in the High annual income from dairying category.

Table 12. Distribution of the members of Private dairy & dairy Co-operatives according to their annual Income from dairying (Rupees.)

S. No	Category	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Low(<10,000)	62	67
2.	Medium(10,000-25,000)	30	23
3.	High(>25,000)	8	10

income was significantly higher (Rs. 13,285.30) in the member group than non-member group (Rs. 3,602.75). The overall labour utilization per annum per household was also significantly higher (207.36 man days) in the member group than the non-member group (181.92 man days).

13. Employment Generation. Majority of the member of Private dairy & Dairy Co-operatives (52.00% and 59.00%) belong to low employment generation group Nearly, 31.00 % members of private dairy and 25.00% members of dairy Co-operative members fell in the medium employment generation category while Nearly, 17.00 % members of private dairy and 16.00% members of dairy Co-operative members fell in the high material possession category. Adoption of the dairy farming as small scale and part time occupation led to low level of the employment generation.

Table 13. Distribution of respondents according to the extent of employment generation through dairy husbandry (Man days/year).

S. No	Category	(Man days/year)	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	Low	Up to 175	52	59
2.	Medium	175-200	31	25
3.	High	>200	17	16

14. Material Possession. Majority of the member of Private dairy & dairy Co-operatives (64.00% and 73.00%) belong to medium material possession group nearly, 20.00 % members of private dairy and 23.00% members of dairy Co-operative members fell in the low material possession category while Nearly, 16.00 % members of private dairy and 4.00% members of dairy Co-operative members fell in the high material possession category. Among agricultural materials plough is most possessed implement by both co-operative and private dairy members while combine is the least possessed implement by both the members of the

Table 14. Distribution of the members of Private dairy & dairy Co-operatives according to their Material Possession.

S. No.	Score	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
1.	low(Up to 5)	20	23
2.	Medium(5-10)	64	73
3.	High(>10)	16	4

dairy co-operatives and private dairies. Among the non-agricultural materials cell phone was the most possessed item by both the dairy cooperatives and private dairies while the computer was the least possessed by both of them. Since most of the farmers are small and medium scale so they do not possess luxury goods of any kind and only basic necessary goods and implements are possessed by them. The past findings in this field that of Natchimuthu (2002) was in line with these who found the majority of farmers possessed medium farm and non-farm materials.

Table 15. Frequency of the members of Private dairy & dairy Co-operatives according to their Material Possession.

S. No	Material Possession	Percentage of Members of Private dairies	Percentage of Members of Dairy Co-operatives
A. Agricultural			
1.	Plough	89	100
2.	Seed drill	54	43
3.	Thresher	5	8
4.	Tractor	57	68
5.	Trolley	47	58
6.	Sprayer	45	34
7.	Sprinkler/drip irrigation system	34	23
8.	Combine	1	0
9.	Leveler	23	24
10.	Ridge maker	34	45
11.	Tube well	34	54
B. Non Agricultural			
12.	Cooler	67	78
13.	T.V.	89	95
14.	Refrigerator	5	6
15.	U.P.S.(Invertors)	18	4
16.	Bike /scooter	56	67
17.	Car	23	34
18.	Mixer	3	23
19.	Tele-phone/cello phone	92	95
20.	Computer	4	2

Conclusion

More percent of the members of the private dairies (29%) of respondents belonged to the category of up to primary while maximum numbers of the dairy co-operatives (35 percent) belonged to the Illiterate category followed by having studied up to middle and higher secondary, gradate and above of the respondents having middle and higher secondary, Graduate and above graduate, respectively.

Most of the respondents of both private dairies (44 percent) and dairy co-operatives (58 percent) fell under small family size group. Followed by 31.00 & 25.00 per cent in the Medium group. More than 50 percent of the respondents of both private dairies 33.00 per cent and dairy cooperatives 37.00 fell under Small land holding group. Followed by Marginal, Medium, large and Land less. Most of the respondents of both private dairies (47.00 percent) and dairy cooperatives (54.00 percent) fell under Agriculture + Dairying Category occupation followed by dairying only.

Small size animal herd possessed by both private dairies (47.00 percent) and dairy co-operatives (51.00 percent) respondents followed by medium and high. low milk consumption (59.00 percent and 68.00 percent respectively), milk production (54.00 and 57.00 % respectively) and sale (40.00 and 50.00 % respectively) was found in most of the respondents of both private dairies and dairy cooperatives. A Large number of the respondents fell under medium social participation (40.00 percent and 43.00 percent respectively) Low Extension contact (58.00 percent and 59.00 percent respectively), and medium mass media exposure (73.00 percent and 67.00 percent respectively). Most of the respondents of both private Dairies (62.00 percent), and Dairy co-operatives (67.00 percent), fell under lower income group followed by medium (30.00 percent and 23.00 percent) respectively. Majority of the members of the private dairies (64.00 percent) and dairy co-operatives (73.00 percent) fell in the Medium Material possession category Plough was the most possessed agricultural implement by both co-operative and private dairy members while combine was the least possessed implement by both the members of the dairy co-operatives and private dairies. Among the non agricultural materials cell phone was the most possessed item by both the dairy cooperatives and private dairies while the computer was the least possessed by both of them.

References

- Das S, (2003). A multivariate analysis of dairy farming practices among rehabilitated and van Gujjars in Hardwar, Uttaranchal. Ph.D. Thesis, NDRI (Deemed University), Karnal
- Kumar (1995). Impact of dairy co-operative on rural economy in Nalanda District. *J. Dairying, Foods & Home Science*, 18(2): 92-97
- Kumar R, (2001). A study of constraints in the adoption of improved dairy husbandry practices by farmer's of Aligarh District. Ph.D. Thesis, NDRI (Deemed University), Karnal.
- Lal B, (2007). Role of CIGs in empowerment of dairy farmers: a comprehensive study in Rajasthan. Ph.D. Thesis, NDRI (Deemed University), Karnal.
- Prakash A, (2009). Impact of Self Help Groups (SHGs) on growth of dairy farming in Haryana. Ph.D. Thesis, NDRI (Deemed University), Karnal, Haryana, India.
- Sah A.K, (2005). Entrepreneurship among milk producers in northern region of India Ph.D. Thesis, NDRI (Deemed University), Karnal. India.
- Sarangi A, (2006). Knowledge management for improving CMP prices among land less dairy women of Haryana through interactive multimedia. Ph.D. Thesis NDRI (Deemed University) Karnal, India.
- Singh U, (2006). Multidimensional impact of women dairy cooperative societies on beneficiaries in Haryana. Ph.D. Thesis, NDRI (Deemed University) Karnal, India.
- Srilatha P, (2005). A study of beneficiaries & non- beneficiaries of dairy clinics running under argil clinics in Rajasthan. Ph.D. Thesis, NDRI (Deemed University) Karnal.
- Verma, O. P, (1993). A study of differential impact of milk cooperative societies in Upper Gangetic plains. Ph.D. Thesis, NDRI (Deemed University), Karnal, Haryana, India.
- Natchimuthu K, (2002). A study of Socio-economic & technical impact of A.H. Programmes in Pondicherry Ph.D. Thesis, NDRI (Deemed University), Karnal.
- Meena B.S, (1993). A study of adoption and training needs as perceived by farmers of Sawai Madhopur District (Raj.). M.Sc. Thesis, NDRI (Deemed University), Karnal, India.
- Meena G.L, Jain D.K, & Dhaka J.P, (2009). Impact of dairy cooperatives on income and Employment generation of milk producers in Alwar district. *Rajasthan Journal of Dairying, Foods and Home Sciences* 28 (1):49-51.