



## Perception of Member Dairy Farmers about Animal Health Care Services and Input Facilities Provided By Milkfed

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### ABSTRACT

The present study was conducted to evaluate the response of dairy farmers about the timely availability of technical and extension services provided by milkfed in Amritsar, Bathinda and Ludhiana districts of Punjab. For the study, response of total 225 dairy farmers (75 each from Amritsar, Bathinda and Ludhiana districts) was analyzed regarding the provision of input services provided by milkfed. Data was collected with the help of well-designed questionnaire comprising of different type of questions regarding the technical and extension services. The results of the study indicated that overall 93.78% dairy farmers from Amritsar, Bathinda and Ludhiana districts responded in agreement that milkfed provide them technical services along-with different kind of products and medicines at the subsidized rates. Apart from the routine services provided by milkfed, 30.22% and 32.89% member farmers responded that milkfed also provide them green fodder seeds and bonus at the end of the year. It has been reported in the current study that dairy farmers from Bathinda and Ludhiana districts are very much satisfied with the facilities provided to them by milkfed whereas dairy farmers from Amritsar district seemed to be unsatisfied with the facilities provided by Milkfed. The results of study suggest that milkfed has to develop extensive extension system especially in Amritsar district to promote latest farming practices among its members farmers.

**Keywords:** Dairy cooperative, milkfed, technical services, extension services

India is a dairy predominant country. Dairy farming in India has grown hugely from being a traditional family run occupation to an organized industry with technological specializations. The current growth has been amassed with the help of millions of small farmers, cooperatives and assistances provided by the government. Round the year it provided income to the people who only bank on payments from small seasonal crops or from intermittent labor. The development of dairy has been a boon for dairy farmers which are customarily weak especially the small landholders, landless laborers and women. The rapid growth and modernization is largely credited to the contribution of dairy cooperatives in India.

These cooperatives have obviated the exploitation of dairy farmers by exploitative middlemen and private

contractors. Further, dairy cooperatives play a momentous role in furnishing livestock extension services to enhance the competence of dairy and it is the lone reason why dairy cooperatives are earning much attention during the past decagon in developing countries. Presently, 70,000 village dairy cooperative societies are federated into about 170 district milk unions which are afterwards federated into 22 state cooperative dairy federations (Ramananda, 2012). But, due to competitive market players, these cooperatives are able to handle only about 17% of the merchandisable milk (Rathod *et al.*, 2012).

In a cooperative system most of the unions also provide a range of inputs and services to the village societies like feed, veterinary services, artificial insemination, and other services (Rajendran *et al.*, 2004). Punjab state



is a leader among the dairy progressive states of India. Contribution of Punjab towards milk production is 9% of the total milk production of the country although it has less than 2% of total cattle and buffalo production in the country. Per capita availability of milk (1032 grams per day) in Punjab is highest in the country (NDDB, 2015). From last few decades Punjab is also antecedent towards various dairy cooperatives like Nestle, Milkfed, Bani, Amul, Glaxosmithkline, Wockhardt. Punjab's very own state cooperative milk producers' federation limited is popularly known as milkfed.

Milkfed targets the activities for promoting production, procurement and processing of milk for the economic augmentation of milk producers by furnishing remunerative milk market to them at their door step. It is operating with 11 milk producers unions and 9 milk plants in Punjab. Currently, there is a firm network of about 7385 milk producers cooperative societies organized at village level. Approximately, 4.10 lakh milk producers are attached to these societies. Milkfed has also established cattle feed plants (Khanna and Ghania Ke Banger), fodder seed processing Unit (Bassi Pathana) and frozen semen station (Khanna). Milkfed procures on an average 12.75 lac liters of milk per day against its handling capacity of 19.75 lakh liters per day (2014-15). The products of milkfed in market are sold under the brand name of Verka.

However, the capability of any dairy cooperative to accomplish its full productive potential is affected by the availability and quality of extension services being delivered to the farmers apart from the mobilization of its resources and economic growth. Further, to encourage farmers to adopt dairy as an entrepreneur, milkfed has arranged milking machines (1415) and milking parlors (4) to the milk producers of Punjab on 50% subsidy. Conjoint to milk procurement & its marketing, milkfed also claims to furnish technical inputs at the door steps of the farmers relating to animal health care, AI services, quality fodder seeds and quality cattle feed of various variants to increase the milk yield of the animals. As of now no systematic study in Punjab is available on the cooperative system, therefore, the current study is planned with the objective to know about the perception of farmers about the timely availability of technical and extension services provided by milkfed.

## MATERIALS AND METHODS

### Location of the study

The study was conducted in Amritsar, Bathinda and Ludhiana districts of Punjab.

### Selection of the respondents

In the study, a total of 225 member famers of milkfed, 75 members each from Amritsar, Bathinda and Ludhiana were selected randomly for the collection of data. Dairy farmers were approached at the village level societies of Verka to evaluate their response towards milkfed. The questionnaire was administered to dairy farmers on the societies by personal interview in Amritsar, Bathinda and Ludhiana districts.

### Methodology

A questionnaire comprising of structured questions regarding response of farmers about the timely availability of services provided by milkfed was used for interviewing the member farmers of milkfed.

### Statistical analysis of data

Data was entered and analyzed using SAS, version 9.3. Frequencies, percentages, Chi-square test and ANOVA method are the basic statistical tools that are used to represent the perception of dairy farmers regarding the services offered by milkfed in selected areas of Punjab. Significance for frequencies and percentages are obtained by using Chi-square test of independence.

## RESULTS AND DISCUSSION

### Technical services

Current study has revealed that 93.78% dairy farmers out of the 225 farmers in Amritsar, Bathinda and Ludhiana districts responded that Verka provide technical services as well as products and medicines at subsidized rates (Table 1). Although 12 farmers from Amritsar and two farmers from Ludhiana district were not receiving any kind of service, whereas 100% dairy farmers from Bathinda revealed that they were getting sufficient support from Verka. Further,

63.56% farmers out of 225 farmers responded that Verka provide them subsidies and schemes (Table 1). Further, it was observed that 55 farmers from Ludhiana, 48 from Amritsar and 40 farmers from Bathinda district got the facility of subsidies and schemes from Verka. Moreover, our findings are in line with the findings of Singh (2014) who reported that 92.46% respondent availed subsidy for purchasing the animals in Dangs district of Gujarat. It was recorded that 56.44% received nutrition supplements from Verka in the three districts together. In the district wise distribution 73 farmers from Bathinda followed by 36 from Ludhiana and 18 farmers from Amritsar, were getting nutrition supplements. However, Singh (2014) in his study on village dairy cooperatives in Dangs district of Gujarat reported 100% of the dairy farmers received cattle feed and mineral mixture for their dairy animals.

It has been reported in the present study that 71.11% farmers of the three districts get dewormer from Verka (Table 1). Our results have been supported by the findings of Sabapara *et al.* (2015) who reported that almost 50% respondents dewormed their milch animals at regular interval. Further, it has been recorded that all of the farmers i.e. 75 farmers from Ludhiana, followed by 68 from Bathinda and meager number of farmers i.e. 17 farmers from Amritsar acquired dewormer from Verka. It indicates towards the poor delivery system in Amritsar district.

The current study also revealed that 93.78% farmers practiced vaccination of their animals in three districts taken together. The 100% (75) dairy farmers from Bathinda, followed by 69 and 67 dairy farmers from both Amritsar and Ludhiana districts respectively are doing regular vaccination of animals. Similar findings also have been reported by Sabapara *et al.* (2015) which revealed that 96.33% of the respondents practiced regular vaccination of their dairy animals.

The current study revealed that overall 85.33% dairy farmers consulted local veterinarians of Department of Animal Husbandry, in all the three districts taken together. Further, in case of need 13.78% farmers said that Verka provide them veterinarian to treat their animals in all the three districts (Table 1). Our results are supported with the findings of Sabapara *et al.* (2010 ; 2015) who also revealed that 78% of the respondents got treated their sick dairy animals by livestock inspectors, whereas 22% respondents got treated their sick dairy animals by

qualified veterinarians. Further, 91.56% farmers from the three districts reported that veterinarian visits when required, 1.33% farmers reported that the veterinarian visits after every 10-15 days and 7.11% farmers reported that the veterinarian visits once in a month to their farm (Table 1). Although, Rathod *et al.* (2014) in their study demanded that the veterinarian should visit the dairy farms in a village twice a week to provide veterinary services.

The perception of farmers towards animal health care services of Verka is depicted in the Table 1 which revealed that 30.67% of the respondents answered that veterinarian appointed by Verka visited their farm periodically. It was discussed by Sulastris and Maharjan (2002) that Cooperatives employed the veterinarians to provide animal health care services at farmers' door and these Veterinarians visited weekly to the farms. It has been observed that 41 respondents in Ludhiana, followed by 28 in Bathinda revealed that veterinarian provided by Verka visit periodically at their dairy farms. However, an astonishing fact came into light in Amritsar district where all the respondents reported that veterinarian employed by Verka did not visit their farms (Table 1). Further, 39 farmers in Ludhiana and 25 farmers in Bathinda responded that veterinarian provided by Verka visit their farms when required or on call. A significant finding has been revealed in Amritsar district where all 75 farmers revealed that there is no provision of veterinarian by Verka (Table 1). The results are similar with the findings of Sangameswaran and Prasad (2016) who reported that none of the respondents of co-operative agency availed therapeutic services by cooperative societies in Salem district of Tamil Nadu. Similar pattern has also been reported by Reddy (2014) where meager 25% respondents responded that veterinary services were provided to them by Mulkanoor cooperative dairy in Karimnagar. Therefore, it can be said that as compared to the cooperatives of other states, milkfed is providing comparatively better veterinary health cover.

Later propagation of A.I. for breeding purpose and supply of semen straws by milkfed were also studied under the current study. It has been found that all the farmers have adopted A.I. as a mode of reproduction and for breed improvement. We have studied that for A.I. 100 dairy farmers responded that veterinarian from Animal Husbandry department was called at door steps to perform A.I. of their dairy animals or animals were taken to veterinary hospital. 41 farmers preferred private

**Table 1:** Perception of member dairy farmer's about animal health care services provided by Milkfed to its members

Variable	Response	Amritsar	Bathinda	Ludhiana	Total
Does Verka provide technical services and different kinds of product at subsidized rates?	Yes	63 (28.00)	75 (33.33)	73 (32.44)	211 (93.78)
	No	12 (5.33)	0 (0.00)	2 (0.89)	14 (6.22)
Does verka provide schemes/ Subsidies?	Yes	48 (21.33)	40 (17.78)	55 (24.44)	143 (63.56)
	No	27 (12.00)	35 (15.56)	20 (8.89)	82 (36.44)
Does verka provide Nutrition supplements?	Yes	18 (8.00)	73 (32.44)	36 (16.00)	127 (56.44)
	No	57 (25.33)	2 (0.89)	39 (17.33)	98 (43.56)
Do you get dewormer from verka?	Yes	17 (7.56)	68 (30.22)	75 (33.33)	160 (71.11)
	No	58 (25.78)	7 (3.11)	0 (0.00)	65 (28.89)
Do you vaccinate your animals?	Yes	69 (30.67)	75 (33.33)	67 (29.78)	211 (93.78)
	No	6 (2.67)	0 (0.00)	8 (3.56)	14 (6.22)
If yes, from where you get your animals vaccinated?	A.H. department	55 (26.07)	55 (26.07)	49 (23.22)	159 (75.36)
	Provided by Verka	0 (0.00)	3 (1.42)	11 (5.21)	14 (6.64)
Contact with VO/ VI of A.H. Department	Yes	68 (30.22)	61 (27.11)	63 (28.00)	192 (85.33)
	No	7 (3.11)	14 (6.22)	12 (5.33)	33 (14.67)
Verka provide Veterinarian	Yes	0 (0.00)	8 (3.56)	23 (10.22)	31 (13.78)
	No	75 (33.33)	67 (29.78)	52 (23.11)	194 (86.22)
Frequency of Veterinarian's visit	When needed	74 (32.89)	73 (32.44)	59 (26.22)	206 (91.56)
	After 10-15 days	1 (0.44)	2 (0.89)	0 (0.00)	3 (1.33)
	Monthly	0 (0.00)	0 (0.00)	16 (7.11)	16 (7.11)
Does Veterinarian assign by Verka visits your farm periodically?	Yes	0 (0.00)	28 (12.44)	41 (18.22)	69 (30.67)
	No	75 (33.33)	47 (20.89)	34 (15.11)	156 (69.33)
Does Veterinarian assign by Verka visits your farm on call?	Yes	0 (0.00)	25 (11.11)	39 (17.33)	64 (28.44)
	No	75 (33.33)	50 (22.22)	36 (16.00)	161 (71.56)

Values depicted in parenthesis indicate percentage.

practitioner and 84 farmers contacted veterinarian hired by Verka to receive semen of tested bulls for breeding purpose in all the three districts (Table 2). However, Rathod *et al.* (2014) has also reflected satisfaction level with respect to the timely animal breeding services provided by cooperative society. Among the buffalo farmers it has been observed that 87.11% used Murrah semen while meager pocket (1.33%) of farmers from our study used semen of Nili Ravi breed of buffalo. Similarly, among the cattle farms it has been concluded that maximum HF semen for insemination has been used in Bathinda (42) followed by Amritsar (24) and Ludhiana (21) (Table 2). 29.78% farmers have Sahiwal cattle and even 8.89% farmers have bred Jersey cattle too (Table 2).

In the current study, 52.44% farmers reported that Verka provide them mineral mixture at the subsidized rates whereas 47.56% farmers preferred to buy mineral mixture

from market. Among the three districts of our study, least number of farmers (14) those received mineral mixture from Verka belonged to Amritsar district (Table 2) whereas equal number of farmers from Bathinda and Ludhiana received mineral mixture from Verka. The findings of Singh and Sharma (2009 & 2010) in their study at dairy union in Udaipur district of Rajasthan also revealed that majority of respondents received mineral mixture to increase productivity and fertility of animals.

In the current study it is concluded that Verka provides the technical inputs to the milk producers for production enhancement activities. These services are provided to the members through the village level societies on the subsidized costs. In the present study it was revealed that majority farmers in Ludhiana (73) followed by Bathinda (72) and Amritsar (57) districts received animal feed by Verka. Out of the total 225 farmers in the three districts,

**Table 2:** Perception of member dairy farmer's about input facilities provided by Milkfed to its members

Variable	Response	Amritsar	Bathinda	Ludhiana	Total
Source of semen straw	Veterinary Hospital/ Local Veterinarian	32 (14.22)	22 (9.78)	46 (20.44)	100 (44.44)
	Private	19 (8.44)	7 (3.11)	15 (6.66)	41 (18.22)
	Verka society	26 (11.56)	41 (18.22)	17 (7.56)	84 (37.33)
Murrah semen	Yes	64 (28.44)	68 (30.22)	64 (28.44)	196 (87.11)
	No	11 (4.89)	7 (3.11)	11 (4.89)	29 (12.89)
Neeli Ravi semen	Yes	2 (0.89)	0 (0.00)	1 (0.44)	3 (1.33)
	No	73 (32.44)	75 (33.33)	74 (32.89)	222 (98.67)
HF semen	Yes	24 (10.67)	42 (18.67)	21 (9.33)	87 (38.67)
	No	51 (22.67)	33 (14.67)	54 (24.00)	138 (61.33)
Sahiwal semen	Yes	25 (11.11)	20 (8.89)	22 (9.78)	67 (29.78)
	No	50 (22.22)	55 (24.44)	53 (23.56)	158 (70.22)
Jersey semen	Yes	14 (6.22)	0 (0.00)	6 (2.67)	20 (8.89)
	No	61 (27.11)	75 (33.33)	69 (30.67)	205 (91.11)
Source of mineral mixture	Market	61 (27.11)	20 (8.89)	26 (11.56)	107 (47.56)
	Verka Society	14 (6.22)	55 (24.44)	49 (21.78)	118 (52.44)
Does Verka provide feed?	Yes	57 (25.33)	72 (32.00)	73 (32.44)	202 (89.78)
	No	18 (8.00)	3 (1.33)	2 (0.89)	23 (10.22)
Does verka provide medicines?	Yes	16 (7.11)	65 (28.89)	72 (32.00)	153 (68.00)
	No	59 (26.22)	10 (4.44)	3 (1.33)	72 (32.00)
Any other facility provided by Verka	Fodder seed	15 (6.67)	32 (14.22)	21 (9.33)	68 (30.22)
	Bonus	30 (13.33)	14 (6.22)	30 (13.33)	74 (32.89)
How often you come in contact with experts from university?	At mela	23 (10.22)	56 (24.89)	60 (26.67)	139 (61.78)
	No contact	52 (23.11)	19 (8.44)	15 (6.67)	86 (38.22)
Do you visit Pashu Palan Mela/ Livestock Championship/ Kisan Melas organized by GADVASU/ A.H. Department?	Yes	23 (10.22)	56 (24.89)	60 (26.67)	139 (61.78)
	No	52 (23.11)	19 (8.44)	15 (6.67)	86 (38.22)
Does verka deliver lectures to farmers?	Yes	1 (0.44)	12 (5.33)	37 (16.44)	50 (22.22)
	No	74 (32.89)	63 (28.00)	38 (16.89)	175 (77.78)
Does verka educate about need for deworming and vaccination?	Yes	5 (2.22)	62 (27.56)	45 (20.00)	112 (49.78)
	No	70 (31.11)	13 (5.78)	30 (13.33)	113 (50.22)
Does Verka provide literature?	Yes	0 (0.00)	18 (8.00)	41 (18.22)	59 (26.22)
	No	75 (33.33)	57 (25.33)	34 (15.11)	166 (73.78)
Does verka organizes animal treatment camps?	Yes	0 (0.00)	51 (22.67)	34 (15.11)	85 (37.78)
	No	75 (33.33)	24 (10.67)	41 (18.22)	140 (62.22)
Does verka organizes field days/ Disease awareness camps?	Yes	0 (0.00)	52 (23.11)	25 (11.11)	77 (34.22)
	No	75 (33.33)	23 (10.22)	50 (22.22)	148 (65.78)

Values depicted in parenthesis indicate percentage.



89.78% farmers responded that Verka provide them feed for their animals (Table 2). However, Sangameswaran and Prasad (2016) reported inverse pattern where cattle feed was provided to very low number of respondents in Salem district of Tamil Nadu. The results of our study are similar with the findings of Reddy (2014) who reported that animal feed was provided to three-fourth of the respondents in Mulkanoor village. It was also reported that overall 68% farmers from all the three districts responded that medicines were available at the societies of Verka at reasonable prices. 72 farmers from Ludhiana, followed by 65 farmers from Bathinda and only 16 farmers from Amritsar districts received medicines. A similar trend also has been revealed by Challakumar and Sreenivasaiah (2016) that Bangalore milk union provided veterinary medicines to its member dairy farmers in Karnataka.

The farmers were then inquired about other facilities of Verka. According to 30.22% farmers from all the three districts, Verka provide them green fodder seeds, whereas 32.89% farmers too replied that Verka accommodate them with bonus from the profit of the society which has been supported by the study of Kaur and Kaur (2016) which revealed that Milkfed provided bonus to their member farmers in Punjab. Therefore, the pattern of results retrieved from the current study, suggests that dairy farmers from Bathinda and Ludhiana districts are satisfied with the facilities provided to them by Verka whereas dairy farmers from Amritsar district especially from border area seemed to be unsatisfied with the facilities provided by Verka. It was revealed by Rathod *et al.* (2011) that the cooperative society provided fodder seeds of Lucerne and Gajaraj to the farmers and also educated them for cultivation of these fodder crops.

When the farmers were surveyed for their contact with the Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana, it was found that 61.78% farmers visited university at the time of mela. Majority (60) of the farmers from Ludhiana district, followed by 56 farmers of Bathinda and 23 farmers from Amritsar district visited the Pashu Palan Melas organised by the veterinary University. Further it is reported that 61.78% farmers in Amritsar, Bathinda and Ludhiana districts actively participated in the Pashu Palan Melas, Livestock Championships and Kisan melas organised by GADVASU or Animal Husbandry department.

### Extension services

Out of 225 farmers under study, 22.22% farmers gained knowledge from Verka in the form of lectures. At the same time, dairy farmers in three districts i.e. Ludhiana (37), Bathinda (12) and Amritsar (1) responded in favour of Verka for delivering extension lectures to them (Table 2). In the current study it was reported that 49.78% farmers responded that Verka educate them about the importance of deworming and vaccination through extension lectures, animal welfare camps and field days. In the district wise distribution, majority (62) of farmers from Bathinda, followed by 45 farmers in Ludhiana and only 5 farmers from Amritsar district revealed that Verka educate them about the importance of deworming and vaccination. Similarly, a study conducted in Surat district by Sabapara *et al.* (2015) also complimented our results showing that 50% of the respondents practiced deworming of their dairy animals regularly.

Verka also provides relevant literature regarding modern dairy practices to the member farmers. But it has been received by only 26.22% farmers (Table 2), district wise distribution pattern has reflected that 41 farmers in Ludhiana, followed by 18 farmers in Bathinda and no farmer in Amritsar were provided with the literature. Moreover contrary findings have been submitted by Singh and Sharma (2009 & 2010) from their study on dairy cooperatives in Udaipur district of Rajasthan. In the current study a lacuna with respect to organization of animal treatment camps by Verka has been recorded. Only 37.78% farmers responded that Verka organizes animal treatment camps. At the same time only 34.22% farmers accorded that Verka organizes field days and disease awareness camps for animals (Table 2). Highest number of farmers (51) from Bathinda district, followed by 34 farmers in Ludhiana responded that Verka organizes animal treatment camps in their villages. It is worth mentioning here that an opposite trend has been observed in Amritsar. All the farmers from Amritsar district reported that Verka does not organize any such kind of the camps. However, 52 farmers in Bathinda and 25 farmers in Ludhiana responded that awareness camps were organized by Verka. It has been observed that inspite of the oldest region to have operational cooperative systems farmers of Amritsar district are still lagging behind in receiving such kind of facilities. The present results of our study are

contrary with the findings of Singh (2014) who revealed that 99.21% respondents agreed with the statement that veterinary camps were organized by dairy cooperatives for the treatment of dairy animals in Dangs district of Gujarat.

## REFERENCES

- Challakumar, J.A.A. and Sreenivasaiah, K. 2016. Nature and scope of milk cooperatives under Bangalore milk union. *Int. J. Eng. Manag. Sci.*, **7**(4): 253-261.
- Kaur, S. and Kaur, P. 2016. Marginal and small farmers' access to modern milk marketing chains in Punjab. *Indian J. Econ. Dev.*, **12**(1a): 1-6.
- NDDDB. 2015-16. *Annual Statistics 2015-16*, National dairy development board, Anand, India.
- Rajendran, K. and Mohanty, S. 2004. Dairy co-operatives and milk marketing in India: constraints and opportunities. *J. Food Dist. Res.*, **35**(2): 34-41.
- Ramananda, M.S. 2012. Dairy co-operative –viable tool for rural development. *Int. J. Res. IT Manag.*, **2**(11): 10-20.
- Rathod, P., Nikam, T.R., Landge, S. and Hatey, A. 2011. SWOT analysis of dairy cooperatives: A case study of western Maharashtra. *Int. J. Res. Comm. Manag.*, **2**(8): 35-41.
- Rathod, P., Nikam, T.R., Landge, S. and Hatey, A. 2012. Perceived constraints in livestock service delivery by dairy cooperatives: A case study of western Maharashtra, India. *Indian J. Dairy Sci.*, **65**(5): 423-430.
- Rathod, P., Nikam, T.R., Landge, S., Hatey, A. and Singh, B.P. 2014. Perception towards livestock breeding service delivery by dairy cooperatives. *Indian Res. J. Ext. Edu.*, **14**(2): 91-95.
- Reddy, R. 2014. Women entrepreneurship in rural areas- A study of Mulkanoor women cooperative dairy. *J. Econ. Finan.*, **5**(2): 52-56.
- Sabapara, G.P., Desai, P.M., Singh, R.R. and Kharadi, V.B. 2010. Breeding and health care management status of dairy animals in the tribal area of south Gujarat. *Indian J. Anim. Sci.*, **80**: 1148-1151.
- Sabapara, G.P., Fulsoundar, A.B. and Kharadi, V.B. 2015. Milking and health care management practices followed by dairy animal owners in rural areas of Surat district. *Sch. J. Agric. Vet. Sci.*, **2**(2A): 112-117.
- Sangameswaran, R. and Prasad, S. 2016. Extent of willingness to pay for dairy husbandry services by milk producers of Salem district of Tamil Nadu. *Indian Res. J. Ext. Edu.*, **16**(3): 67-72.
- Singh, N. and Sharma, F.L. 2009 & 2010. Input facilities received by the members of dairy cooperative societies from Udaipur dairy union in southern Rajasthan. *Raj. J. Extn. Edu.*, **17&18**: 156-159.
- Singh, S.B. 2014. Dairy cooperatives as a tool for rural development and women empowerment in Dangs. *Phd. (Rural Management) Thesis*, center for studies in rural management, Gujarat vidyapath.
- Sulastri, E. and Maharjan, K.L. 2002. Role of dairy cooperative services on dairy development in Indonesia a case study of Daerah Istimewa Yogyakarta province. *J. Int. Dev. Coop.*, **9**(1): 17-39.

