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Comparative Analysis of Beneficiaries and Non-beneficiaries about Scientific Livestock Farming Practices

Akshita Chadda[1], Y.S. Jadoun[1], Jaswinder Singh[1], S.K. Kansal[1]

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ABSTRACT

Background: Punjab being a productive state in agriculture and livestock farming, various institutions are actively involved in Self Help Group formation for socio- economic development of low-income group. Rural women are engaged in small-scale entrepreneurship programme with the help of Self Help Groups. The present study was conducted to assess the impact of livestock based Self Help Groups on knowledge level regarding the scientific livestock farming practices among the beneficiaries of Self Help Groups and non-beneficiaries.

Methods: The study was undertaken in Ludhiana district of Punjab. A multistage random sampling procedure was applied to draw the sample for the study. For meeting the objective; 120 beneficiaries and 60 non-beneficiaries were subjected to structured interview schedule.

Result: The study revealed that majority of the beneficiaries (50.00%) and non-beneficiaries (55.00%) had medium level of knowledge regarding overall scientific livestock farming practices. Knowledge Index was higher in case of beneficiaries (61.46) than that of non-beneficiaries (56.68). Self Help Groups had made a significant positive impact on knowledge level of the beneficiaries and thus helped in improving overall socio-economic conditions of the rural women.

Key words: Beneficiaries, Knowledge level, Non-beneficiaries, Scientific livestock farming practices, Self help groups.

INTRODUCTION

Animal husbandry sector is emerging as an important growth engine of the Indian economy. The share of livestock sector in GDP has gradually risen because of the growing demand for livestock products impelled by urbanization and population growth. Livestock sector contributes 4.11% GDP and 25.6% of total Agriculture GDP in India. About 20.5 million people depend upon livestock for their livelihood and it provides employment to about 8.8% of the population in India (20th Livestock Census, 2019). Low-cost investments in small-scale livestock keeping such as dairy cow, sheep, goats, poultry offers the opportunities for women not only to increase household income but also to control over it, which helps in reducing gender inequality and empowering women farmers (Millennium Development Goal 3, 2015). Dairy based enterprise has been regarded as an important socio-economic instrument to supplement the income and employment opportunities to the rural women (Ponnusamy *et al.,* 2017). About 69.00 per cent of the labour on livestock farms is provided by women (Patel *et al.,* 2016).

In spite of active involvement of women in livestock activities, they are not given adequate participatory or decision-making power, in the family or society. Thus, Self Help Groups have been recognized as an institutional innovation for rural development and improves collective decision making of women. In the developing world, around 200 million people have found their way into SHGs by 2017 (Greaney *et al.,* 2016). The Women Self Help Groups have played a dynamic role in the socio-economic development (Kumar, 2012). In India, SHGs saving linked with banks are 102.43 lakhs, out of which 88.32 lakhs SHGs are exclusively for women. There are 1.02 crore groups under SHG-Bank Linkage Programme covering 12.4 crore households across India (Government of India, NABARD, 2019). In Punjab, there are around 8647 SHGs, out of that 7396 (85.53%) are exclusively women SHGs (Dhiman and Rani, 2014).

Although India has vast resource of livestock but average productivity of livestock is very low attributed to unawareness, low knowledge and adoption of scientific livestock farming practices by the farmers. Improved livestock productivity demands supreme care in feeding,

[1]Department of Veterinary and Animal Husbandry Extension Education, College of Veterinary Sciences, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141 004 Punjab, India.

Corresponding Author: Y.S. Jadoun, Department of Veterinary and Animal Husbandry Extension Education, College of Veterinary Sciences, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141 004, Punjab, India.
Email: ysvet1203@gmail.com

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breeding and health practices of animals. The quality of livestock products is affected by the knowledge of the farmer about improved animal management practices (Singh and Gupta, 2015). Hence knowledge becomes a central factor in adoption or non-adoption of recommended livestock practices. In this context, present study was conducted with the objective to assess and compare the knowledge level among beneficiaries of Self Help Groups (SHGs) and non-beneficiaries with respect to feeding, breeding, health care and management practices.

MATERIALS AND METHODS

The present study was conducted in Ludhiana district of Punjab during 2018-19. For meeting the objective; 120 beneficiaries and 60 non-beneficiaries were subjected to structured interview schedule. Ludhiana district was purposively selected based on large number of livestock based functional women Self Help Groups. A multistage random sampling procedure was applied. Twenty four (24) SHGs were selected randomly which were successfully functioning for more than 3 years in livestock farming activities in various villages of different blocks of Ludhiana district of Punjab, India. Five (05) SHG women members were selected randomly from each SHG, which make the 120 respondents. Then, in order to find out the impact of SHGs on the beneficiaries, another 'control' group of 60 non-SHG women members (treated as 'Non-beneficiaries') were selected, randomly, from the same or adjoining SHG villages. Thus, total 120 SHG beneficiaries and 60 non-beneficiaries were selected for the study.

To measure the knowledge level of the respondents, a knowledge test developed by Sah (2005) was used with slight modifications. The knowledge test was administered to the respondents and responses were obtained under multiple choice questions. The scores assigned to the responses were in the range of 0-3. Scoring was done according to the correctness of the response against each item. Knowledge score of individuals in different aspects such as breeding (maximum score 15), feeding (maximum score 13), healthcare (maximum score 11) and management (maximum score 15) were obtained by summing up scores of each item under different aspects. The total score obtained by individual respondent for all the statements was calculated and analyzed with the help of mean and standard deviation and respondents were categorized as low (Below mean-S.D.), medium (mean±S.D.) and high (Above mean+S.D.) with respect to their knowledge level. The following formula was used to measure the knowledge index.

$$\text{Knowledge index} = \frac{\text{Score obtained by an individual}}{\text{Maximum obtainable score}} \times 100$$

RESULTS AND DISCUSSION

Knowledge of respondents about scientific breeding practices

Among breeding practices (Table 1), 87.50 per cent of the beneficiaries had medium knowledge on pregnancy diagnosis. Gunaseelan *et al*. (2018) in a study reported higher level of knowledge on pregnancy diagnosis. Majority (98.33%) of the beneficiaries had medium knowledge on cross breeds. About 67.50 per cent of the beneficiaries possessed medium knowledge on performing AI at right time, respectively. With respect to identification of milch

Table 1: Distribution of respondents on the basis of knowledge about scientific breeding practices.

Particulars	Category	Beneficiaries (n=120)	Non-beneficiaries (n=60)
Pregnancy diagnosis after artificial insemination/natural service	Low (<2)	02 (1.67)	08 (13.33)
	Medium (2-3)	105 (87.50)	47 (78.34)
	High (>3)	13 (10.83)	05 (8.33)
Knowledge on cross breeds	Low (<1)	0 (0.00)	07 (11.66)
	Medium (1-2)	118 (98.33)	52 (86.67)
	High (>2)	02 (1.67)	01 (1.67)
Right time of insemination	Low (<2)	13 (10.83)	13 (21.67)
	Medium (2-3)	81 (67.50)	35 (58.33)
	High (>3)	26 (21.67)	12 (20.00)
Oestrus cycle	Low (<1)	12 (10.00)	10 (16.67)
	Medium (1-2)	108 (90.00)	50 (83.33)
	High (>2)	0 (0.00)	0 (0.00)
Inter-calving interval	Low (<2)	08 (6.66)	09 (15.00)
	Medium (2-2.5)	71 (59.17)	40 (66.67)
	High (>2.5)	41 (34.17)	11 (18.33)
Ideal time of placental removal after calving	Low (<3)	03 (2.50)	04 (6.67)
	Medium (3-4)	117 (97.50)	56 (93.33)
	High (>4)	0 (0.00)	0 (0.00)

(Figures in parenthesis indicate percentage).

animals in heat, 90.00 per cent of the beneficiaries were observed in medium category. Most of the beneficiaries (59.17%) possessed medium level of knowledge related to inter-calving interval. Regarding ideal time of placental removal, highest number of the beneficiaries (97.50%) had medium knowledge. (Lohakare *et al*., 2015; Laldinpuii *et al.,* 2018).

In case of non-beneficiaries, Table 1 revealed that, 78.34 per cent had medium knowledge regarding pregnancy diagnosis. As far as knowledge related to cross breeds of cow/buffalo was concerned, 86.67 per cent had medium level of knowledge. With respect to AI at right time, most of the non-beneficiaries (58.33%) had medium knowledge. About 83.33 per cent of them possessed medium knowledge related to oestrus cycle. Regarding knowledge on inter-calving interval and ideal time of placental removal, medium level of knowledge was reported among 66.67 per cent and 93.33 per cent of non-beneficiaries, respectively (Lohakare *et al.,* 2015; Laldinpuii *et al.,* 2018).

Knowledge of respondents about scientific feeding practices

In respect of feeding practices, Table 2 showed that 62.50 per cent beneficiaries and 63.00 percent non-beneficiaries had medium knowledge on accurate time of colostrum feeding to newly-born calf. With respect to practices followed to feed the new-born calf, about 80.00 per cent of beneficiaries and 18.33 per cent of non-beneficiaries had medium level of knowledge. Maximum number of the beneficiaries (97.50%) and non-beneficiaries (75.00%) possessed medium level

Table 2: Distribution of respondents on the basis of knowledge about scientific feeding practices.

Particulars	Category	Beneficiaries (n=120)	Non beneficiaries (n=60)
Accurate time of colostrum feeding to newly-born calf	Low (<3)	02 (1.67)	12 (20.00)
	Medium (3-3.5)	75 (62.50)	38 (63.00)
	High (>3.5)	43 (35.83)	10 (17.00)
Practices followed to feed the new-born calf	Low (<3)	02 (1.67)	06 (10.00)
	Medium (3-3.5)	96 (80.00)	50 (83.33)
	High (>3.5)	22 (18.33)	04 (6.67)
Balanced feeding	Low (<1)	01 (0.83)	15 (25.00)
	Medium (1-2)	117 (97.50)	45 (75.00)
	High (>2)	02 (1.67)	0 (0.00)
Additional concentrate feeding to cow /buffalo at 7-8 months of pregnancy	Low (<2)	03 (2.50)	05 (8.33)
	Medium (2-3)	96 (80.00)	47 (78.33)
	High (>3)	21 (17.50)	08 (13.34)
Extra amount of concentrate feeding to cow/buffalo giving milk more than 5 kg. per day	Low (<2)	01 (0.83)	09 (15.00)
	Medium (2-2.5)	93 (77.50)	41 (68.00)
	High (>2.5)	26 (21.67)	10 (17.00)

(Figures in parenthesis indicate percentage).

Table 3: Distribution of respondents on the basis of knowledge about scientific health care practices.

Particulars	Category	Beneficiaries (n=120)	Non beneficiaries (n=60)
Right time for vaccination against the contagious diseases	Low (<2)	07 (5.83)	11 (18.33)
	Medium (2-3)	113 (94.17)	49 (81.67)
	High (>3)	0 (0.00)	0 (0.00)
Important symptoms of Mastitis disease	Low (<2.5)	24 (20.00)	32 (53.00)
	Medium (2.5-3)	64 (53.00)	25 (42.00)
	High (>3)	32 (27.00)	03 (5.00)
Important symptoms of Hemorrhagic Septicemia	Low (<1)	06 (5.00)	17 (28.33)
	Medium (1-2)	107 (89.17)	43 (71.67)
	High (>2)	07 (5.83)	0 (0.00)
Symptoms of parasitic infestation in a calf	Low (<1)	0 (0.00)	02 (3.33)
	Medium (1-2)	111 (92.50)	58 (96.67)
	High (>2)	09 (7.50)	0 (0.00)
Advantages of vaccination	Low (<2)	05 (4.17)	05 (8.33)
	Medium (2-2.5)	97 (80.83)	55 (91.67)
	High (>2.5)	18 (15.00)	0 (0.00)

(Figures in parenthesis indicate percentage).

of knowledge regarding balanced feeding. About additional concentrate feeding, 80.00 per cent and 78.33 per cent of beneficiaries and non-beneficiaries, respectively were under medium category. About 77.50 per cent and 68.00 per cent of the beneficiaries and non-beneficiaries, respectively, had medium knowledge on extra amount of concentrate feeding. Similar findings were accounted regarding feeding of additional concentrate to pregnant animals (Kaur *et al*., 2017; Bhuyan *et al.,* 2018).

Knowledge of respondents about scientific health care practices

Regarding health care practices, Table 3 revealed that majority of the beneficiaries (94.17%) and non- beneficiaries (81.67%) had medium level of knowledge on right time for vaccination against the contagious diseases. In case of symptoms of mastitis, about 53.00 per cent beneficiaries possessed medium knowledge while 53.00 per cent of non beneficiaries were under low category. With respect to important symptoms of Hemorrhagic Septicemia, medium knowledge was reported among beneficiaries (89.17%) and non-beneficiaries (71.67%). Maximum number of beneficiaries (92.50%) and non beneficiaries (96.67%) had medium knowledge on symptoms of parasitic infestation. As far as advantages of vaccination was concerned, medium level of knowledge was reported among majority of beneficiaries (80.83%) and non-beneficiaries (91.67%) (Kumar, 2015; Singh *et al.,* 2017).

Knowledge of respondents about scientific management practices

In case of management practices Table 4 illustrated that among beneficiaries, 87.00 per cent and 13.00 per cent had medium and high knowledge, respectively; whereas majority (85.00%) of non-beneficiaries had medium knowledge on suckling of newly-born calf to its mother. About method followed for cleaning milk pail, 93.00 per cent of the beneficiaries and 95.00 per cent of the non-beneficiaries had medium knowledge level. With respect to right time of placental removal, medium level of knowledge was observed among beneficiaries (90.00%) and non-beneficiaries (78.00%). Medium level of knowledge was reported among majority of beneficiaries (95.83%) and non-beneficiaries (90.00%) on age of dehorning in calves. Gunaseelan *et al.* (2018) reported that majority of respondents had low knowledge followed by medium and high. With respect to dry period, 87.00 per cent beneficiaries and 82.00 non-beneficiaries had medium knowledge. Regarding age of male calf castration, most of the beneficiaries (79.17%) and non-beneficiaries (73.33%) possessed medium level of knowledge.

Distribution of respondents on the basis of their knowledge about overall SLFPs

A glance of the Table 5 revealed that among beneficiaries, about 58.33 per cent and 65.00 per cent had medium level of knowledge regarding breeding and feeding practices, respectively. Similar finding were observed by (Rupeshkumar and Chandawat, 2011; Biswas *et al.,* 2012; Gunaseelan *et al.,* 2018). Regarding healthcare and management practices, majority of the respondents; 61.66 per cent and 67.50 per cent, respectively were observed in medium category. These findings are similar to the study of Satyanarayan and Jagadeeswary (2010).

Among non-beneficiaries; 48.33 per cent, 56.67 per cent, 55.00 per cent and 75.00 per cent had medium level

Table 4: Distribution of respondents on the basis of knowledge about scientific management practices.

Particulars	Category	Beneficiaries (n=120)	Non beneficiaries (n=60)
Newly-born calf allowed to suck its mother	Low (<1)	0 (0.00)	05 (8.33)
	Medium (1-2)	104 (87.00)	51 (85.00)
	High (>2)	16 (13.00)	04 (6.67)
Method followed for cleaning milk pail	Low (<3.5)	05 (4.17)	03 (5.00)
	Medium (3.5-4)	111 (92.50)	57 (95.00)
	High (>4)	04 (3.33)	0 (0.00)
Right time of placental removal	Low (<3.5)	12 (10.00)	13 (22.00)
	Medium (3.5-4)	108 (90.00)	47 (78.00)
	High (>4)	0 (0.00)	0 (0.00)
Age of calf dehorning	Low (<2)	02 (1.67)	05 (8.30)
	Medium (2-3)	115 (95.83)	54 (90.00)
	High (>3)	03 (2.50)	01 (1.70)
Dry period allowed for a lactating pregnant cow/buffalo	Low (<3.5)	16 (13.00)	11 (18.00)
	Medium (3.5-4)	104 (87.00)	49 (82.00)
	High (>4)	0 (0.00)	0 (0.00)
Age of male calf castration	Low (<1)	10 (8.33)	14 (23.33)
	Medium (1-2)	95 (79.17)	44 (73.33)
	High (>2)	15 (12.50)	02 (3.34)

(Figures in parenthesis indicate percentage).

of knowledge regarding breeding, feeding, healthcare and management practices, respectively (Table 5). Similar findings were reported related to feeding practices (Kaur and Rathore, 2014; Prajapati *et al.,* 2015; Sharma *et al.,* 2018). Ahirwar *et al*. (2016) and Kaur *et al*. (2017) reported the related findings regarding knowledge level of management practices.

As far as overall knowledge about SLFPs was concerned, results in Table 5 showed that among beneficiaries, majority of the respondents (50.00%) were in medium category, followed by high (33.33%) and low (16.67%) category. Such findings are very similar to (Sah, 2005; Durgga, 2009; Lohakare *et al.,* 2015; Mevada *et al.,* 2018). Whereas in case of non-beneficiaries, majority of them (55.00%) were in medium category, followed by low (31.67%) and high (13.33%) category (Mande *et al.,* 2008; Kumar *et al.,* 2011; Sabapara *et al.,* 2014; Kaur *et al*., 2017).

Extent of knowledge among respondents about SLFPs

A perusal of Table 6 revealed that management practices were ranked first by the beneficiaries and non-beneficiaries with knowledge index 67.40 and 63.33, respectively; followed by feeding practices (rank II) with knowledge index 65.83 and 62.18, respectively. Breeding practices were

Table 5: Distribution of respondents on the basis of their knowledge about overall SLFPs.

Particulars	Mean	Category	Beneficiaries (n=120)	Non beneficiaries (n=60)
Breeding practices	9.00	Low (<8)	22 (18.33)	19 (31.67)
		Medium (8-10)	70 (58.33)	29 (48.33)
		High (>10)	28 (23.34)	12 (20.00)
Feeding practices	8.40	Low (<8)	18 (15.00)	17 (28.33)
		Medium (8-9)	78 (65.00)	34 (56.67)
		High (>9)	24 (20.00)	09 (15.00)
Health Care practices	5.06	Low (<4)	17 (14.17)	17 (28.33)
		Medium (4-6)	74 (61.66)	33 (55.00)
		High (>6)	29 (24.17)	10 (16.67)
Management practices	11.23	Low (<10)	24 (20.00)	07 (11.67)
		Medium (10-12)	81 (67.50)	45 (75.00)
		High (>12)	15 (12.50)	08 (13.33)
Overall	33.68	Low (<31)	20 (16.67)	19 (31.67)
		Medium (31-36)	60 (50.00)	33 (55.00)
		High (>36)	40 (33.33)	08 (13.33)

(Figures in parenthesis indicate percentage).

Table 6: Extent of knowledge among respondents about SLFPs.

Particulars	Beneficiaries (n=120)		Non beneficiaries (n=60)	
	Knowledge index	Rank	Knowledge index	Rank
Breeding practices	64.21	3	60.13	3
Feeding practices	65.83	2	62.18	2
Health care practices	48.41	4	41.06	4
Management practices	67.40	1	63.33	1
Overall knowledge index	61.46		56.68	

Table 7: Average differences in knowledge score regarding SLFPs among beneficiaries and non-beneficiaries.

Particulars	Mean score		Mean Difference (d)	'Z' value
	Beneficiaries (n=120)	Non beneficiaries (n=60)		
Breeding practices	9.22	8.57	-0.65	2.24*
Feeding practices	8.56	8.08	-0.48	2.39**
Health care practices	5.33	4.52	-0.81	3.55**
Management practices	11.46	10.77	-0.69	2.80**
Overall knowledge	34.56	31.93	-2.63	3.89**

**Significant at P<0.01, *Significant at P<0.05.

ranked III by the beneficiaries and non-beneficiaries with knowledge index 64.21 and 60.13, respectively. Healthcare practices were ranked last by the beneficiaries and non-beneficiaries with knowledge index 48.41 and 41.06. Overall knowledge index was higher in case of beneficiaries (61.46) than that of non-beneficiaries (56.68) Rahman and Gupta (2015).

Average differences in knowledge score regarding SLFPs among beneficiaries and non-beneficiaries

The calculated 'Z' value (Table 7) indicated the significant difference between beneficiaries and non-beneficiaries regarding knowledge of scientific livestock farming practices at 1 per cent and 5 per level of significance.

The SHG beneficiaries had more knowledge than the non- beneficiaries in almost all the four categories of scientific livestock farming practices due to frequent extension contact, more exposure through pashupalan melas/kisanmela and timely information provided by SHG developmental organizations. Similar findings were reported by Rahman and Gupta (2015).

CONCLUSION

Majority of the respondents had medium knowledge about SLFPs. SHG beneficiaries had more knowledge towards SLFPs than non-beneficiaries due to information empowerment of SHG beneficiaries through group activities like trainings, meetings and contacts with change agents. The knowledge level possessed by non-beneficiaries necessitates huge improvement. Participatory cum need based training programmes, demonstrations *etc*. should be organized to increase the know-how of non-beneficiaries and making them self-reliant. Moreover developmental organizations should make more deliberate efforts to enhance the working efficiency of SHGs.

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Conflict of interest

All authors declared that they have no conflicts of interest.

REFERENCES

20th Livestock Census. (2019). Department of Animal Husbandry, Dairying and Fisheries Ministry of Agriculture and Farmers Welfare Govt. of India, New Delhi.

Ahirwar, M.K., Singh, H.S., Patel, R.K. and Mondal, M.K. (2016). Socio-personal and economic profile of peri-urban and rural dairy farmers in Rewa district of Madhya Pradesh. International Journal of Agriculture Sciences. 8: 3548-3551.

Bhuyan M., Ponnusamy, K. and Bhattacharyya, S. (2018). Knowledge level of farm women in scientific dairy farming. Journal of Community Mobilization and Sustainable Development. 13: 507-512.

Biswas, S., Sikar, D.P. and Goswami, A. (2012). Study on comparative knowledge level about improved dairy farming practices of SHG and Non-SHG members in West Bengal. Indian Research Journal of Extension Education. 12: 104-109.

Dhiman, P.K. and Rani, A. (2014). A Study on Marketing Strategies of Self-Help Groups in Punjab: Challenges and Constraints. International Journal of Sales and Marketing. 4: 1-10.

Durgga, R.V. (2009). Crisis Management Practices Adopted in Dairy Farming by the Farmers of Anand district of Gujarat (Doctoral Dissertation, AAU).

Government of India. National Bank for Agricultural and Rural Development. (2019). Status of Microfinance in India 2019-2020. Mumbai: NABARD.

Greaney, B.P., Kaboski, J.P. and Leemput, Van. E. (2016). Can Self-Help Groups Really Be 'Self-Help'? The Review of Economic Studies. 83: 1614-1644.

Gunaseelan, M., Thilakar, P., Mathialagan, P. and Pandian, S.S.A. (2018). Knowledge level of scientific dairy farming practices among peri-urban dairy farmers in Thanjavur District of Tamil Nadu. Indian Veterinary Journal. 95: 14-18.

Kaur, R. and Rathore, R. (2014). Knowledge of women regarding dairy farming practices. International Journal of Scientific Research. 3: 197-198.

Kaur, S., Verma, H.K., Singh, J., Dash, S.K. and Kansal, S.K. (2017). Knowledge level of women dairy farmers about various farming practices in border area of Punjab. Journal of Animal Research. 7(6): 1051-1059.

Kumar, M. (2015). Buffalo healthcare management practices followed by the farmers of Ferozepur district of Punjab, India. Indian Journal of Animal Research. 49: 413-415. doi: 10.5958/0976-0555.2015.00125.9.

Kumar, S. (2012). Self- Help Group in socio-economic transformation with special reference to Coimbatore. International Journal of Research in Commerce, Economic and Management. 2: 87-93.

Kumar, S., Kumar, B., Hindustani, S. and Sankhala, G. (2011). Knowledge level dairy farmers in operational area of Krishi Vigyan Kendra about improved dairy farming practices. Research Journal of Agricultural Sciences. 2: 122-124.

Laldinpuii, N., Kansal, S.K., Verma, H.K. and Bhatti, J.S. (2018). Knowledge level of dairy farmers about improved breeding and health care practices in Punjab. International Journal of Trend in Scientific Research and Development. 2: 57-60.

Lohakare, A.C., Kamdi B.P., Nakade, M.K., Basunathe, V.K. and Banthiya, V. (2015). Extent of knowledge of improved animal husbandry practices and socio-economical, psychological characteristics of dairy farmers of Yavatmal district of Vidarbha (Maharashtra). Veterinary Science Research Journal. 6: 23-31.

Mande, J.V., Rajput, R.D. and Thombare, B.M. (2008). Knowledge of cattle owners about improved cattle rearing practices. Journal of Dairying, Foods and Home Sciences. 27: 38-42.

Mevada, V.K., Ashwar, B.K., Patel, S.M. and Ashwar, K.B. (2018). Correlates of level of knowledge of tribal livestock farmers regarding improved animal husbandry practices. International Journal of Chemical Studies. 6: 1508-1512.

Millennium Development Goals Report. (2015). United Nations.

Patel, S.J., Patel, M.D., Patel, J.H., Patel, A.S. and Gelani, R.N. (2016). Role of women gender in livestock sector: A review. Journal of Livestock Science. 7: 92-96.

Ponnusamy, K., Chauhan, A.K. and Meena, S. (2017). Testing the effectiveness of PasuSakhi: An innovation for resource poor farm women in Rajasthan. Indian Journal of Animal Sciences. 87: 229-233.

Prajapati, V.S., Singh, R.R., Choudhary, Sandhya, S. and Patel, N.B. (2015). Knowledge Level of Dairy Farmers Regarding Recommended Dairy Management Practices. Livestock Research International. 3: 82-84.

Rahman, S. and Gupta, J. (2015). Knowledge and adoption level of improved dairy farming practices of SHG members and non-members in Kamrup district of Assam, India. Indian Journal of Animal Research. 49: 234-240. doi: 10.5958/0976-0555.2015.00059.X.

Rupeshkumar, J.R. and Chandawat, M.S. (2011). Extent of knowledge of improved animal husbandry practices and socio-economical characteristics of dairy farmers of district Kheda, Gujarat. International Journal of Farm Sciences. 1: 129-137.

Sabapara, G.P., Fulsoundar, A.B. and Kharadi, V.B. (2014). Knowledge of dairy animal owners in improved dairy husbandry practices in Surat district of South Gujarat. International Journal of Farm Sciences. 4: 165-173.

Sah, A.K. (2005). Entrepreneurship Among Milk Producers in Northern Region of India (Doctoral Dissertation, National Dairy Research Institute; Karnal).

Singh, S., Sangwan, S.P., Gautam, S.S. and Malik, A. (2017). Study on Health Care Management Practices of Buffaloes in Murrah Tract of Haryana State. International Journal of Livestock Research. 7: 117-125.

Satyanarayan, K. and Jagadeeswary, V. (2010). A study on knowledge and adoption behaviour of livestock farmers. Indian Journal of Animal Research. 44: 100-106.

Sharma, D., Sharma, N. S. and Meena, D.K. (2018). Knowledge of Farm Women about Improved Animal Husbandry Practices in Saurashtra Region of Gujarat, India. International Journal of Current Microbiology and Applied Sciences. 7: 1227-1235.

Singh, V. and Gupta, J. (2015). Promoting clean milk production: The path for milk quality improvement. Journal of Community Mobilization and Sustainable Development. 10: 163-167.