



## Knowledge Level of Women Dairy Farmers about Various Farming Practices in Border Area of Punjab

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### ABSTRACT

Livestock farming is the most proficient occupation in India and women play a very significant role in livestock farming practices in the country. A study was conducted on 160 women dairy farmers of 4 border districts namely Gurdaspur, Amritsar, Taran-Taran and Ferozepur of Punjab to ascertain their knowledge level about various practices related to dairy farming. A pretested structured questionnaire comprising questions on management, nutrition, breeding, health etc. was developed and same was filled during the personal interview with women farmers. Data so collected was analyzed descriptively to draw inference. The data revealed that majority (68.75%) of women has medium knowledge level on various recommended dairy farming practices, 13.75 has low and only 17.5% has high (17.50%) knowledge level. Further this knowledge was significantly ( $P < 0.01$ ) correlated with the number of labor employed, milk production, herd size, and education level. Study concluded that there is an emerged need to educate women on scientific dairy farming practices.

**Keywords:** Border area, dairy farming, knowledge, Punjab, women

India is a leading nation in milk production contributing annual milk production of 155.5 million tons during 2015-16 (Department of Animal husbandry, dairying & Fisheries, Ministry of Agriculture, Government of India), accounting for 18.5% of world production. Dairying is an important means of livelihood to millions of rural farmers. Increasing demand for milk and milk products in recent years intensifies dairy farming as profitable enterprise for women (Mohapatra *et al.*, 2012). The rural women play a significant role in animal husbandry and are indulged in practices like feeding, breeding, management and health care. Women spend most of their time in care and management of the dairy animals. Being key players in flourishing of the dairy industry, women are a helping hand in dairy enterprise. They constitute 71 per cent of the labor force in livestock farming. In India, about 75 million women are engaged as against 15 million men in

dairying (Thakur and Chander, 2006). Depending upon the economic status; women perform the tasks like milking, collecting and processing of dung, preparation of cooking fuel by mixing dung cakes with twigs and crop residues. The major credit for India's position as highest milk producer and subsequent increase in per capita availability of milk has to be given to illiterate rural women dairy farmers (Patel, 1993).

A study conducted by Kacker (2006) also revealed that majority (85%) of persons engaged in dairy production is women. The border area of Punjab comprises of Ferozepur, Taran-Taran, Amritsar and Gurdaspur districts is the most disadvantage one due to its strategic location. Many of the innovations, facilities and government schemes are not reaching to the farmers especially women dairy farmers of the border area. Keeping in view the above the present

study was planned to study the knowledge level of women of border area on various aspects of dairy farming.

## MATERIALS AND METHODS

The study was conducted in four districts namely Gurdaspur, Amritsar, Tarantaran and Ferozepur, of border area of Punjab. Families owning minimum three animals were selected for study. A sample of 40 was randomly selected from each of the four districts. Thus, the total sample comprised of 160 women farmers. The data were collected personally with the help of structured interview schedule. Highest score was awarded to each correct answer followed by nearly correct as lower and incorrect as lowest. Categorization of score was done as low (<mean - standard deviation), medium (mean - standard deviation to mean + standard deviation) and high (>mean + standard deviation). Data collected were statistically analyzed with the help of SPSS 20 software.

## RESULTS AND DISCUSSION

### Socio-economic profile of women dairy farmers

The socio-economic profile of women highlights that majority (66.25%) of women were from middle age group and 43.13% had education up to high school (Table 1). The family size of most (65.62%) of the respondents was small. The findings are in accordance with those of Kaur (2015) who found that majority (66.0%) of respondents was from lower middle age group and majority was having education up to secondary (28.0%). Maximum 23.13% respondents had semi-medium (2-4 hectare) land holding. Most (49.37%) of the respondents and small (> 5 animals) herd size, around 38.75% respondents household were producing less than fifteen liters of milk/day and majority (83.13%) of dairy farm women were of general category. The findings are in line with those of Ahirwar *et al.* (2016).

**Table 1:** Socio-economic profile of dairy farm women

Sl. No.	Particulars	Response	Frequency	%age
1	Age	Young: Less than (Mean- S.D.)	27	16.87
		Middle: (Mean - S.D.) to (Mean + S.D)	106	66.25
		Old: More than (Mean + S.D)	27	16.87
2	Education	Illiterate	54	33.75
		Up to Primary school	6	3.75
		Up to Middle school	5	3.13
		Up to High School	69	43.13
		Up to Graduate	22	13.70
		Graduate and above	4	2.50
3	Family size	Up to 4 members	105	65.62
		5 to 9 members	52	32.50
		More than 9 members	3	1.87
4	Land holding	Landless	15	9.37
		< 1 Hectare (Marginal)	16	10.00
		1 - 2 Hectare (Small)	27	16.87
		2-4 Hectare (Semi-medium)	37	23.13
		4-10 Hectare (Medium)	31	19.37
		> 10 Hectare (Large)	34	21.25
5	Herd Size	Small: up to 5 animals	79	49.37
		Medium: 6 to 9 animals	41	25.63
		Large: 10 or above animals	40	25.00
6	Farm Milk Production	Low	62	38.75
		Medium	60	37.50
		High	38	23.75
7	Category	General	133	83.13
		S.C.	17	10.63
		Others	10	6.25

### Knowledge of women in various aspects of dairy farming

#### Animal Management

The knowledge level of women regarding various practices related to animal management has been revealed in a Table 2. Majority of women (35%) had half *kacha* and half *pucca* shed and most (60%) of women dairy farmers cleaned their shed once daily. Around 48.13% of the women dairy farmers had one worker to assist them in dairy farming activities. More than one third (37.62%) of dairy farm women were disposing the dung by making the cow dung cakes and another one third (30.62%) were disposing it off on the compost heap. Most (79.38%) of the dairy farm women were getting their animals vaccinated but only 28.75% females were maintaining a record of the vaccination of their animals. About 45%, 46.88% and 31.88% of women dairy farmers had correct knowledge about the vaccination against the diseases FMD, HS and Brucellosis, respectively while majority (63.75%) of dairy farm women did not know about zoonotic diseases. The knowledge score of women in animal management has been indicated in Table 8. The findings are in consonance with those of Ahirwar *et al.* (2016) who found that majority of the dairy respondents (51.67%) residing in the peri-urban areas belonged to medium level of management knowledge followed by 31.67% low and 16.66% high level, while that of 48.33% of rural area respondents had a medium level of knowledge followed by 41.67% low and 10.00 % low level of knowledge. Deepak (2004) and Manivannan (2008) also had almost similar findings.

**Table 2:** Knowledge Level of women dairy farmers about animal management

Sl. No.	Particulars	Response	Frequency	%age
1	Type of shed in which animals are kept	No shed	28	17.50
		<i>Kacha</i>	25	15.63
		<i>Pucca</i>	51	31.88
		Half <i>kacha</i> half <i>pucca</i>	56	35.00
2	How many times do you clean the shed	Once a week	11	6.88
		Twice a week	13	8.13
		Once daily	96	60.00
		Twice daily	40	25.00

Sl. No.	Particulars	Response	Frequency	%age
3	How many workers do you have for management of animals?	None	63	39.38
		1	77	48.13
		2	15	9.38
		3 and above	5	3.13
4	How do you dispose-off the dung?	On the compost heap	49	30.62
		By making cow dung cakes	60	37.50
		Directly in the fields	20	12.50
5	Do you vaccinate your animals	Bio-gas plant	31	19.38
		Yes	127	79.38
6	Disease for which vaccinated	No	33	20.63
		Correctly answered	56	35.00
7	Do you keep a record of the vaccination	Not answered/ answered wrong	104	65.00
		Yes	46	28.75
8	When is the vaccination done against FMD?	No	114	71.25
		Do not know	52	32.50
		Annually	36	22.50
9	When is the vaccination done against HS?	6 monthly	72	45.00
		Do not know	53	33.13
		Annually	32	20.00
10	Have you vaccinated your heifer (4-8 months old) against brucellosis?	6 monthly	75	46.88
		Yes	51	31.88
11	Do you know about zoonotic diseases?	No	109	68.13
		Yes	58	36.25
12	What do you do to protect your animals from mosquitoes and insects?	No	102	63.75
		Sprays/Insecticides/nets/other measures adopted	91	56.88
13	Do you follow any measures for control of ticks?	No measures adopted	69	43.13
		Measures adopted	53	33.13
14	How should the animals be kept?	No measures adopted	107	66.88
		Open	34	21.25
		Closed shed	14	8.75
15	Animal should be bathed	Both types	112	70.00
		Once a month	5	3.13
		Daily in summers and once a week in winters	13	8.13
		Once a week	85	53.13
		Daily	57	35.63

Sl. No.	Particulars	Response	Frequency	%age
16	Do you provide special bedding to newly born calf?	Yes	104	65.00
		No	56	35.00
17	Do you feed colostrum to newly born calves?	Yes	151	94.38
		No	9	5.63
18	Do you wait for shedding of placenta before feeding colostrum to calves?	Yes	79	49.38
		No	81	50.63
19	Age upto which colostrum can be fed to a newly born calf	1 week	37	23.12
		2 weeks	18	11.25
		3 week	30	18.75
		1 month	75	46.88
20	What do you use to clean the shed?	Cleaning only with broom	11	6.88
		Water	96	60.00
		Detergent	21	13.13
		Disinfectant	32	20.00
21	Deworming is must for which animals?	Is not necessary	4	2.50
		Healthy animals	21	13.13
		sick animals	50	31.25
		Both	85	53.13
22	What is the optimum age for first deworming of the newly born calf?	Never	25	15.63
		1 week after birth	26	16.25
		2 weeks after birth	56	35.00
		3 weeks and above	53	33.13
23	Deworming of the animal before rainy season	Should be done	92	57.50
		Should not be done	50	31.25
		Should be done after rainy season	18	11.25
24	When should deworming be repeated?	Never	36	22.50
		Annually	58	36.25
		after 6 months	66	41.25

### Animal Nutrition

The data clearly reveals that 76.87% and 28.13% women were aware about the requirement of green fodder and wheat straw to an adult animal, respectively (Table 3). Only one-third (31.88%) of the women dairy farmers were aware about the fodder yield of one acre of land. Majority (70%) of women responded that cattle and buffalo do not require different amounts of concentrate and only

17.50% women knew about the exact requirement of cow and 8.75% of them were aware about the exact amount of concentrate required for buffalo. Majority (83.13%) of women dairy farmers provides additional nutrition to the pregnant dry animal and 56.88 % were not aware that the bulls being used for natural breeding require additional nutrition. Half (56.88%) of the women dairy farmers were not aware about silage feeding. Only 23.75% women knew about the exact quantity of mineral mixture in one quintal concentrate mixture. Most (79.38%) of the women dairy farmers were not having any knowledge about urea treated wheat straw. The knowledge score has been shown in Table 8. In a study conducted by Tajpara *et al.* (2016) the knowledge level of respondents in feeding practices was found to be 58.15%, 13.93% and 27.89% as medium, low and high respectively which go in line with the present study. Similar findings were reported by Ahirwar *et al.* (2016).

**Table 3:** Knowledge of women about animal nutrition

Sl. No.	Particulars	Response	Frequency	%age
1	Quantity of green fodder given to an adult animal daily	<25 kg	37	23.13
		25-35 kg	123	76.87
2	Quantity of wheat straw given daily	Didn't know	38	23.75
		1-2 kg	42	26.25
		3-4 kg	45	28.13
		> 4 kg	35	21.88
3	1 acre land yields fodder for how many animals?	No knowledge	109	68.13
		4-8 animals	51	31.88
4	Do cattle and buffalo require concentrate in different quantities?	Yes	48	30.00
		No	112	70.00
5	What is the concentrate requirement of cow?	Not Specific	32	20.00
		1 kg/ ½ litre milk	60	37.50
		1 kg/1 litre milk	10	6.25
		1 kg/ 2 ½ litre milk	28	17.50
		1 kg/2 litre milk	30	18.75
6	What is the concentrate requirement of buffalo?	Not specific	35	21.88
		½ kg/1 litre milk	41	25.63
		1 kg/1 litre milk	30	18.75
		2 kg/1 litre milk	14	8.75
		2 ½ kg/ 1 litre milk	40	25.00

Sl. No.	Particulars	Response	Frequency	%age
7	Do you provide any additional nutrition to the pregnant animal?	Yes	133	83.13
		No	27	16.88
8	Do you know about silage?	Yes	69	43.13
		No	91	56.88
9	Which one is the best method to increase the quality of milk?	(a) Giving oil to the animal	17	10.63
		(b) More amount of concentrate	42	26.25
		(c) Good quality green fodder	53	33.13
		(d) Both (b) & (c)	48	30.00
10	Concentrate used is:	Home-made	52	32.50
		Ready made from market	108	67.50
11	What is the quantity of mineral mixture in 1 quintal concentrate mixture?	No Knowledge	88	55.00
		100-150gm	16	10.00
		200-250 gm	18	11.25
		1 kg-2 kg	38	23.75
12	Do you have knowledge about urea treated wheat straw?	Yes	33	20.63
		No	127	79.38
13	Does the bull used for natural breeding require additional nutrition?	Yes	69	43.13
		No	91	56.88

### Animal breeding

The major findings of the study show that about 85.63% women dairy farmers were artificially inseminating their animals but only 21.87% were maintaining record of the bull being used for insemination or natural breeding (Table 4). Only 21.87% women dairy farmers were taking their animals to the veterinary hospital for pregnancy diagnosis. Only one-third (36.25%) of women were aware about the optimum time for pregnancy diagnosis. The analysis of 160 respondents indicated (Table 8) that the majority (75.62%) had medium level of knowledge regarding breeding practices, whereas 11.87 and 12.5% had high and low level of knowledge. Similar observations were reported by Sharma (2005) and Aulakh *et al.* (2011).

**Table 4:** Knowledge of women dairy farmers about animal breeding

Sl. No.	Particulars	Response	Frequency	%age
1	How do you carry out breeding?	Natural Breeding	23	14.38
		A.I	137	85.63
2	Do you keep any record of the bull being used for natural breeding?	Yes	35	21.87
		No	125	78.13
3	Pregnancy diagnosis is done by:	Self	8	5.00
		Calling the doctor at home	117	73.13
		Taking the animal to the veterinary hospital	35	21.87
4	What is the optimum time for pregnancy diagnosis?	No knowledge	5	3.13
		4-5 months	37	23.13
		3-4 months	60	37.50
		2-3 month	58	36.25
5	Is progesterone injection given to the animal after A.I.?	Yes	76	47.50
		No	84	52.50
6	For getting one calf per year, when should animal be served after calving?	No knowledge	16	10.00
		>120 days	9	5.63
		Within 90-120 days	25	15.63
		Within 60-90 days	60	37.50
7	What is the optimum time for A.I.?	Within 60 days	50	31.25
		48 hours after heat	43	26.88
		24 hours after heat	39	24.38
8	Normal period for the freshly calved animal to shed/drop placenta	12 hours after heat	78	48.75
		Less than 2 hrs	30	18.75
		Between 2-4 hrs	51	31.88
9	If placenta not dropped in normal time when should it be removed?	Between 4-8 hrs	79	49.38
		Should not be removed	17	10.63
		After 6 hrs	37	23.13
		After 36 hrs	18	11.25
		After 24 hrs	41	25.63
	After 8-12 hrs	47	29.38	

### Handling of milk

Majority (80.63%) of women were milking their animals manually (Table 5). About sixty percent (56.25%) of women dairy farmers declared that full hand milking the best milking method. Most (87.5%) of the women farmers were using only water to clean the udder before milking. Only 15.63% of women dairy farmers could correctly name the diseases like rabies, TB, brucellosis caused by consumption of raw milk. Nearly one-third (33.13%) of women dairy farmers were aware about the dry period of dairy animals. Only half (52.5%) of women knew the exact time to milk an animal. Table 8 reveals the knowledge score which clearly indicates that most (61.25%) of the dairy farm women have medium knowledge followed by low (20.62%) and high (18.12%). The findings are in accordance with those of Deshmukh *et al.* (2014) and Jacob and George (2013) also found that more than half of the respondents had medium knowledge of clean milk production practices (77%) and the rest were in the low category (23%).

**Table 5:** Knowledge of women dairy farmers about handling of milk

Sl. No.	Particulars	Response	Frequency	%age
1	How do you milk the animal?	Manually	129	80.63
		With machine	31	19.38
2	What is the best milking method?	Stripping	4	2.50
		Knuckling method	26	16.25
		Both knuckling and full hand	40	25.00
3	What do you use to clean the udder before milking?	Water	140	87.50
		Potassium permanganate	20	12.50
		Full hand method	90	56.25
4	Name any disease caused by consumption of raw milk.	Answered correctly	25	15.63
		Didn't answer/ answered wrongly	135	84.37
5	Do you have knowledge about teat-dip?	Yes	46	28.75
		No	114	71.25
6	What is the dry-period of milch animal?	Never do	6	3.75
		60 days	53	33.13
		>90 days	24	15.00
		60-90 days	77	48.13

7	How do you churn the milk?	Manually	59	36.87
		With machine	101	63.13
8	How long does it take to milk the animal?	no specific time	13	8.13
		12-20 minutes	7	4.40
		6-12 minutes	56	35.00
		5-6 minutes	84	52.50

### Miscellaneous

Table 6 and 7 highlight the knowledge level of women about various extension activities and the information sources used by them. Majority (62.5%) of women preferred to do agriculture on their land. Only 3.13% women dairy farmers were associated to self-help group/association/society. Nearly 28.13% knew about Krishi Vigyan Kendra (KVK) and only 53.75% had knowledge about GADVASU but only 46.88% could tell the exact location about university's location. Only 17.5% of women had taken training about dairy farming and a majority (72.5%) of dairy farm women was interested in taking training about dairy farming. Majority (65.62%) of women preferred training to be conducted in their own village while 25% wanted it to be at the district level KVK and only 9.38% preferred the training at university campus. Nearly half of the women (54.38%) preferred the duration of training to be of one week and 21.88% wanted it to be of 2-3 days while 23.75% preferred it to be of one month duration. From table 8, it can be concluded that most (65.5%) of the women had medium knowledge score followed by high (20%) and low (17.5%). Durga and Subhadra (2009) had also highlighted the need for conducting more number of need-based and well-tailored training programmers suited to farm women that would in turn help them to have more extension agency contacts. The findings are in track with those of Sowjanya and Halakatti (2015).

**Table 6:** Miscellaneous Knowledge of dairy farm women

Sl. No	Particulars	Response	Frequency	%age
1	What would you prefer to do on your land?	Any other practice	5	3.13
		Agriculture	100	62.50
		Dairy farming	55	34.37
2	Are you associated to any Self-Help Group/ Association/Society?	No	155	96.87
		Yes	5	3.13

Sl. No	Particulars	Response	Frequency	%age
3	Do you know about Krishi Vigyan Kendra (KVK)?	No	115	71.87
		Yes	45	28.13
4	Have you heard about GADVASU?	No	74	46.25
		Yes	86	53.75
5	Where is GADVASU located?	Ludhiana	75	46.87
		Other cities	85	53.13
6	Have you ever taken any training?	No	132	82.50
		Yes	28	17.50
7	Would you like to take any training regarding dairy farming?	No	44	27.50
		Yes	116	72.50
8	Where the training should be conducted?	University	15	9.37
		district level/ KVK	40	25.00
		in your own village	105	65.62
9	What should be the duration of the training?	1 month	38	23.75
		1 week	87	54.37
		2-3 days	35	21.87
10	Preference for instructor:	No preference	46	28.75
		Female	58	36.25
		Male	56	35.00

**Table 7:** Information sources used by dairy farm women

Sl. No.	Source of information	No. of users	% Users
1	Family member	73	46.00
2	Neighbors\Relatives	56	35.00
3	Books/magazines/newspaper	53	33.00
4	Radio	33	21.00
5	T.V.	76	48.00
6	Melas	44	27.50
7	Training camps	22	13.80

**Knowledge score**

Table 8 indicates the overall score of dairy farm women about various animal husbandry activities. The findings for overall score are in consonance with those of Sharma (2005); Singh (2010); Aulakh *et al.* (2011); Mali *et al.* (2014) and Ahirwar *et al.* (2016).

**Table 8:** Knowledge scores of women in various disciplines

Sl. No.	Variable	Total score	Low (%age)	Medium (%age)	High (%age)
1	Animal Management	53	13.75	67.50	18.75
2	Animal Nutrition	29	17.50	61.87	20.62
3	Animal Breeding	28	12.50	75.62	11.87
4	Handling of milk	25	20.62	61.25	18.12
5	Miscellaneous	16	17.5	62.5	20
6	Overall Knowledge score	151	13.75	68.75	17.50

**Effect of various independent variables on the Knowledge Score**

District had a significant ( $P<0.05$ ) effect on the knowledge level of dairy farm women. Taran-taran and Gurdaspur had low knowledge score as compared to Amritsar and Ferozepur (Table 9). Amritsar district women dairy farmers had highest ( $P<0.05$ ) knowledge score and was comparable with that of Ferozepur. Education had a significant effect ( $P<0.05$ ) on the overall knowledge score of dairy farm women. Women with high and medium education had higher knowledge score as compared to women with low education. The knowledge level of medium and high education level did not vary significantly. Herd size also had a significant effect ( $P<0.05$ ) on the knowledge level of the dairy farm women. Women having large herd size had higher knowledge as compared to those having small and medium herd size.

**Table 9:** Effect of various variables on the knowledge score

Categories	Sub- Categories	Mean ± S.E.
District	TaranTaran	53.89±2.04 <sup>a</sup>
	Amritsar	63.94±1.70 <sup>b</sup>
	Gurdaspur	53.14±1.84 <sup>a</sup>
	Ferozepur	59.32±1.60 <sup>b</sup>
Category	General	58.21±0.94
	S.C.	54.14±2.40
	Others	55.43±3.30

Education	Low	57.11±1.50 <sup>b</sup>
	Medium	56.61±1.30 <sup>a</sup>
	High	61.60±2.00 <sup>a</sup>
Herd Size	Small	55.03±1.33 <sup>a</sup>
	Medium	55.93±1.73 <sup>a</sup>
	Large	64.35±1.80 <sup>b</sup>

<sup>a</sup> and <sup>b</sup> represent the significance at 0.05 level of significance

### Correlation of various variables with knowledge score

To determine the correlation between the knowledge score and the independent variables the r value was calculated. It was found that no. of workers, farm milk production, land holding and herd-size were significantly ( $p < 0.01$ ) correlated with the knowledge while the other factors like age and education were also positively correlated but the correlation was not found to be significant (Table 10). The results for correlation are in accordance with the findings of Rathod *et al.* (2011) and Deshmukh *et al.* (2014).

**Table 10:** Correlation of various variables with the knowledge score

Sl. No.	Variable	'r' value	P value
1	No. of Workers	0.388**	0.000
2	Farm milk production	0.298**	0.000
3	Age	0.051	0.525
4	Education	0.047	0.557
5	Land holding of the family	0.421**	0.000
6	Herd size	0.319**	0.000

\*\*= significant at 0.01 level of significance

### CONCLUSION

From the above study it can be concluded that majority of women dairy farmers (68.75%) from the border area of Punjab had medium knowledge about dairy farming. Education, district and herd size had significant effect on the knowledge score of the dairy farm women. To enhance the knowledge level of dairy farm women about various practices related to dairy farming extension services to these areas are required to be improved and trainings at regional level should be conducted.

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