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Comparative analysis of KVK trainees and non-trainees about scientific dairy farming

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Abstract

Krishi Vigyan Kendra (KVK) has been organizing on-farm and off-farm training Programmes for effective dissemination of new technologies for the benefit of farmers in the country. Current study was undertaken to analysis KVK training about scientific dairy farming practices against the statistically formed comparison group of non-trainees' dairy farmers in Gujarat state of India. Three KVKs of North Gujarat region were purposively selected for the present investigation. Total 300 respondents selected for the research, out of it 150 KVK trainees and to generate the comparison group, 150 non-trainees were selected. A study revealed that majority (76.33 per cent) of trainees and non-trainees had medium level of adoption of scientific dairy farming practices, followed by high (12.67 per cent) and low (11.00 per cent) level. Also, highly significant difference found between trainees and non-trainees regarding adoption of scientific dairy farming practices at one percent level of significance. Mean of trainees and non-trainees also had significance difference in adoption of scientific dairy farming practices. It indicated that trainees had higher significant impact on adoption of scientific dairy farming practices than non-trainees.

Keywords: Krishi Vigyan Kendra, scientific dairy farming, trainees, non-trainees

Introduction

India possessed ranked 1st in milk production, contributing 24.00 per cent of global milk production. The milk production has increased from 222.07 million tons in 2021-22 to 230.58 million tons in 2022-23 at national level, which registered a growth of 3.83%. There has been steady increase in per capita availability of milk since 2016- 17. The per capita availability has increased from 351 gm/ day in 2016-17 to 459 gm /day in 2022-23 BAHS (2023) [4].

ICAR-Agricultural Technology Application Research Institute (ATARI) has a well-established frontline extension system in the form of Krishi Vigyan Kendra (KVK) for effective dissemination of new technologies for the benefit of farmers in the country. It plays multifaceted roles in assessing location specificity of technologies, demonstrating the frontier technologies, validating and refining locale-specific technologies, providing information and inputs, mainly through participatory approaches.

Training plays an important role in the advancement of human performance in a given situation. Training provides a systematic improvement of knowledge and skills which in turn helps the trainees to function effectively and efficiently in their given task on completion of the training (Lynton and Pareek, U.1990) [13]. Evaluation of the training has a great value in implementation of any kind of Programme. Accepted meaning of evaluation is to determine value of Programme. Keeping all these, in view comparative analysis of KVK training about scientific dairy farming practices in North Gujarat was undertaken to generate empirical data for future planning, modification and implementation.

Materials and Methods

The present *ex-post facto* study was conducted in the Indian state of Gujarat. Three KVK namely Tharad (Banaskantha), Khedbrahma (Sabarkantha) and Samoda (Patan) of North Gujarat region were purposively selected for the investigation considering high density of dairy animal population area and in high milk producing areas of the North Gujarat. The list of participants of the trainings procured from respective KVKs. On the basis of the list, five villages having highest participants were selected purposively from each KVK. Ten Beneficiary respondents from each village were randomly selected, thus making a list of 50 trainees from each KVK. Total 150 beneficiary trainee's respondent were selected. To generate the comparison group, same villages were selected and from each village minimum 10 non-trainees' farmers were selected. Thus, making a group of totals 150 non-trainees' respondents. Thus, the ultimate sample size for the study comprised of 150 trainees and 150 non-trainees'

respondents. Total 300 respondents were selected for the study. The data were collected from the selected household on farm and farmers specific characteristics and their adoption about dairy farming practices.

Results and Discussion

The data presented in table 1 indicated that trainees and non-trainees were not found significant different in term of socio-personal variables, trainees were higher in age (mean score 43.62) and belonged to higher caste category (mean score 2.68), lower in education level (mean score 2.76), more in nuclear family (mean score 1.52) and had small family size (mean score 1.78). According to mean value of categorical data related to variables suggested that larger proportion of trainees and non-trainees had education up to primary school level.

As concern to socioeconomic characteristics non-significant difference was found between average land holdings across both the groups, trainees (2.78 hector) were found to have slightly higher land possession than non-trainees (2.58 hector).

There was found significant difference in trainees and non-trainees with respect to the possession of herd size, occupation of dairy farmers, net annual income from dairy farming and total annual family income. Trainees (mean score 13.53) were found to hold higher herd size compared to non-trainees (mean score 12.36). This finding is in line with Nande (2019) [11], Mahesh (2020) [10] and Usadadiya (2021) [21] who stated that majority of the dairy farmers had medium sized herd. Occupation of non-trainees (mean score 2.91) were found slightly higher value than the trainees (2.64). This finding is in line with that of Pandhare (2012) [14], Udmale (2015) [20] and Barman (2022) [3], while Sahu (2016) [16]. As concern to net annual income dairy farming trainees had significantly higher average net annual income from dairy farming than the non-trainees, it might be due to their better awareness, knowledge and adoption of scientific dairy practices. Similar findings were reported by Lal (2009) [5] and Pandhare (2012) [14], while Khode (2020) [6] and Mahesh (2020) [10] who stated that majority of dairy farmers had high annual income, whereas average annual family income of trainees was significantly higher than that of non-trainees. This average annual family income difference among trainees and non-trainees might be due to comparatively higher contribution of dairy farm income to annual family income among trainees than non-trainees. The result is in conformity with that of Nazir (2012) [12], Pandhare (2012) [14].

Communication sources (*viz*. mass media, formal and informal sources) play a vital role in the transfer of technologies. In Mass media utilization both the groups were significantly different and therefore implies that trainees with mean score 22.32 were higher in mass media utilization compared to mean score of non-trainees (20.95). This might be due to the cosmopolite nature of trainee with regards to their mass media utilization. the analysis of extension contact showed non-significant difference between trainees (mean score 16.12) and non-trainees (mean score 15.96). Informal contact indicated that there was negative and highly significant difference ($p < 0.01$) between trainees and non-trainees, which indicated low informal contact of trainees than non-trainees. This might be due to more utilization of mass media by trainees compared to non-trainees as evident in their mass media exposure.

As concern to psychological characteristics risk orientation, attitude towards dairy farming, risk orientation and knowledge level of dairy farmers had significant difference in trainees and non-trainees. Whereas economic motivation and scientific orientation showed non-significant difference in trainees and non-trainees. Attitude of trainees and non-trainees' respondent, both the group held favorable attitude that was evident from their average mean score 37.45 and 38.17 in trainees and non-trainees' group, respectively. It also leads to conclude that non-trainee's farmers had to some extent better attitude than trainee's farmers towards dairy farming. Whereas knowledge of dairy farmers regarding scientific dairy farming concerned. Definitely the training they received through KVKs would have helped them to update and improve their knowledge on all aspects pertaining to scientific dairy farming. Statically, 't' value showed highly significant difference in knowledge level (-5.177**) of trainees and non-trainees indicated knowledge level trainees had higher knowledge than non-trainees.

Distribution of respondents according to their differential adoption of scientific dairy farming practices by trainees and non-trainees are presented in table 2. it shows that regarding feeding practices, majority of trainees and non-trainees had continuous adoption of Providing feed and fodder as per requirement (mean score 0.99), Providing feed and fodder in manger (mean score 0.89), Chaff cutting of fodder (mean score 0.85) and Supplementation of mineral mixture (mean score 0.75). Relatively large (33.33 per cent) of trainees was found to have continuous adoption of Proper method of hay making' as compared to (27.33 per cent) of non-trainees. It further reveled that more per cent of trainees adopted advance feeding practices like Supplementation of bypass fat (21.33 per cent), Supplementation of bypass protein (19.33 per cent), Silage making (14.66 per cent), Azolla production technology (8.00 per cent) and importance of hydroponics (06.66) than non-trainees. Regarding water management practices**,** all the trainees and non-trainees had continuous adoption of Reliable source for clean drinking water (mean score 0.94) and follow Proper time of serving water (mean score 0.94). Majority of trainees had continuous adoption of Giving water even at night (96.66 per cent) and provide clean drinking water adlib for 24 hrs. (96.66 per cent) this finding found similar with the finding of Ashwar B.K. (2005) [2].

In term of management practices, majority of trainees and non-trainees had continuous adoption of Providing cheap but well ventilated, clean and comfortable house (mean score 0.83), Cleaning shed or house twice daily (mean score 0.79), Providing pucca manger in the house itself (mean score 0.76), Disinfection of shed at regular interval (mean score 0.76) and Proper disposal of dung, urine and foliage (mean score 0.73). Trainees and non-trainees were found significantly different in adoption of Feeding concentrate at time of milking, completing milking in 6-7 minutes, Proper method of manure pit preparation, maintain animal in semi-intensive loose housing system and maintain dairy farm record indicating a greater number of trainees had adoption of these management practices than non-trainees. These finding is in line with Sabapara *et al.* (2010) [15], Thakur *et, al.* (2022) [19] and Ashokbabu *et al*, (2024) [1].

In terms of breeding practices, majority of trainees and non-trainees had continuously adoption of Sign of estrus observation, Artificial insemination method uses, Proper time of insemination checking and Proper time of pregnancy diagnosis. Significant differences were found in trainees and non-trainees' respondents for Timely treatment of anestrous and repeat breeding cow and buffalo (mean score 0.70), Every day watching cow and buffalo for estrous (mean score 0.61), Keeping record of breeding (mean score 0.45) and Maintain inter calving period (mean score 0.38)'.

Related to health management practices, maximum proportion of trainees and non-trainees were found to have continuous adoption of Timely treatment of weak and sick animal, Isolation of weak and sick animals, Identification of weak and sick animals and De-worming in milking animal. Trainees and non-trainees have found significantly different in First aid for common disease like Tympany, Acidosis, Indigestion, etc. (mean score 0.78), Tick control (mean score 0.72) and Maintain health record (mean score 0.47)'. similar finding found with Thakur *et, al.* (2022) [19].

In terms of clean milk production practices, majority of trainees and non-trainees had continuously Keeping their animal in clean and dry place, Timely treatment for mastitis and Washing udder with luke warm water or antiseptic solution before milking. A significant difference in trainees and non-trainees was found in Proper disposal mastitis milk (mean score 0.67) and in Dry cow therapy (mean score 0.57).

Table 1: Distribution of respondents according to various Socio-personal, socio economic, psychological characteristics of dairy farmers (N-300)

Sr. No.	Variables	Trainees (n=150)		Non-trainees (n=150)		't' value
		Mean	SD	Mean	SD	
Socio-personal						
1	Age	43.62	8.5896	42.067	8.1658	1.605
2	Education	2.7600	1.1739	2.8200	1.1296	-0.451
3	Caste	2.6867	1.1300	2.5067	1.0853	1.407
Socio-economic						
4	Family Type	1.5267	0.5001	1.6533	0.4775	-2.242
5	Family Size	1.7867	0.8240	1.9333	0.7998	-1.564
6	Land holding	2.786	0.09	2.580	0.09	1.625
7	Herd size	13.53	0.03	11.18	0.03	3.115*
8	Occupation	2.64	0.055	2.91	0.023	-4.556*
9	Income from dairy farming (Rs.)	166980	116	87116	548	6.23**
10	Annual income (Rs.)	365600	2139	255766	1251	4.43**
Communicational						
11	Mass media exposure	22.31	3.16	20.95	4.11	3.310**
12	Extension agency contact	16.12	4.11	15.96	2.5	-1.190
13	Informal sources of information	8.35	1.8	8.94	1.29	-3.240**
Psychological						
14	Economic motivation	30.78	3.30	30.11	3.3	-1.784
15	Scientific orientation	17.38	2.05	16.96	2.08	-1.693
16	Risk orientation	26.01	3.2	24.59	3.2	-4.80**
17	Attitude towards dairy farming	37.45	3.8	38.17	4.4	-0.85**
18	Knowledge of dairy farming practices	53.95	6.72	50.83	6.88	-5.177**

Table 2: Distribution of respondents according to their adoption of scientific dairy farming (N-300)

Sr. No	Items	Trainees (n=150)	Non-trainees (n=150)	Pooled (N=300)	Mean Score	Rank
Feeding practices						
1.	Provide required balance feed and fodder	150 (100)	147 (98.00)	297 (99.00)	0.99	I
2.	Providing feed and fodder in Manger	144 (96.00)	125 (83.33)	269 (89.66)	0.89	II
3.	Chaff cutting of fodder (cutting 1-2inch piece)	130 (86.66)	125 (83.33)	255 (85.00)	0.85	III
4.	Supplementation of mineral mixture	106 (70.66)	119 (79.33)	225 (75.00)	0.75	IV
5.	Supplementation of salt	87 (58.00)	98 (65.33)	185 (61.66)	0.62	V
6.	Proper method of hay making	50 (33.33)	41 (27.33)	91 (30.33)	0.30	VI
7.	Supplementation of bypass fat	32 (21.33)	28 (18.66)	60 (20.00)	0.20	VII
8.	Supplementation of bypass protein	29 (19.33)	25 (16.66)	59 (19.66)	0.20	VII
9.	Azolla production technology	12 (08.00)	06 (04.00)	18 (06.00)	0.06	IX
10.	Silage making	22 (14.66)	14 (09.33)	36 (12.00)	0.18	VIII
11.	Hydroponics feeding	10 (06.66)	06 (04.00)	16 (05.33)	0.05	X
Water management						
1.	Reliable source clean drinking water	146 (97.33)	138 (92.00)	284 (94.66)	0.95	I
2.	Proper time of serving water	144 (96.00)	139 (92.66)	283 (94.33)	0.94	II
3.	Giving water evenly at night	145 (96.66)	106 (70.66)	251 (83.66)	0.84	III
4.	Provide clean drinking water adlib for 24 hrs.	145 (96.66)	91 (60.66)	236 (78.66)	0.79	IV
	Mean	18.51	16.84			

Management practices						
1.	Providing cheap but well ventilated, clean and comfortable house	129 (86.00)	121(80.66)	250 (83.33)	0.83	I
2.	Cleaning shed or house twice daily	121 (80.66)	116 (77.33)	237 (79.00)	0.79	II
3.	Providing pucca manger in the house itself	114 (76.00)	92 (61.33)	227 (75.66)	0.76	III
4.	Disinfection of shed at regular interval (Dusting, spraying and fumigation)	107 (71.33)	120 (80.00)	227 (75.66)	0.76	III
5.	Proper drainage system in the house	103 (68.66)	96 (64.00)	199 (66.33)	0.66	V
6.	Proper disposal of dung, urine and foliage	113 (75.33)	113 (75.33)	226 (75.33)	0.73	IV
7.	Proper method of manure pit preparation	102 (68.00)	69 (46.00)	171 (57.00)	0.57	VII
8.	Grooming	82 (65.66)	58 (38.66)	140 (46.66)	0.47	VIII
9.	Summer management: arrangement of foggers or other means of control temperature	71 (47.33)	62 (41.33)	133 (44.33)	0.44	X
10.	Milking animal at regular interval	64 (42.66)	70 (46.66)	134 (44.66)	0.47	VIII
11.	Not beating and freighting the animals during milking	74 (49.33)	41 (27.33)	115 (38.33)	0.38	XI
12.	Feeding concentrate at time of milking	107 (71.33)	91 (60.66)	198 (66.00)	0.66	V
13.	Completing milking in 6-7 minutes	95 (63.33)	91 (60.66)	186 (62.00)	0.62	VI
14.	Maintain animal in semi-intensive loose housing system	56 (37.33)	34 (22.66)	90 (30.00)	0.30	XII
15.	Maintain dairy farm record	77 (51.33)	60 (40.00)	137 (45.66)	0.45	IX
16.	Biogas plant installation	55 (36.66)	28 (18.66)	83 (27.66)	0.27	XIII
	Mean	19.52	16.71			
Breeding practices						
1.	Sign of estrus observation	140 (93.33)	142 (94.66)	282 (94.00)	0.94	I
2.	Artificial insemination method uses	137 (89.33)	135 (90.00)	272 (90.66)	0.91	II
3.	Sex-sorted semen use	31 (20.66)	25 (16.66)	56 (18.66)	0.19	X
4.	Proper time of insemination checking	138 (92.00)	136 (90.66)	274 (91.33)	0.91	II
5.	Length of estrus cycle	103 (68.66)	134 (89.33)	237 (75.66)	0.76	VI
6.	Estrus synchronization of animals	00 (00.00)	00 (00.00)	00 (00.00)	0.00	XI
7.	Ideal dry period	112 (74.66)	125 (83.33)	237 (79.00)	0.79	IV
8.	Inter calving period	90 (60.00)	25 (16.66)	115 (38.33)	0.38	XI
9.	Lactation length	124 (82.66)	122 (81.33)	246 (82.00)	0.82	III
10.	Proper time of pregnancy diagnosis	123 (82.00)	124 (82.66)	247 (82.33)	0.82	III
11.	Gestation period of cow and buffalo	122 (81.33)	111 (74.00)	233 (77.66)	0.78	V
12.	Timely treatment of anestrous and repeat breeding cow and buffalo	119 (79.33)	91 (60.66)	210 (70.00)	0.70	VII
13.	Every day watching cow and buffalo estrous	104 (69.33)	80 (53.33)	184 (61.33)	0.61	VIII
14.	Multiple ovulation Embryo transfer technology (MOETT)	00 (00.00)	00 (00.00)	00 (00.00)	0.00	XI
15.	Keeping record of breeding	70 (46.66)	65 (43.33)	135 (45.00)	0.45	IX
	Mean	20.80	20.22			
Health management						
1.	Identification of weak and sick animals	126 (84.00)	115 (76.66)	241 (80.33)	0.80	III
2.	Isolation of weak and sick animals	121 (80.66)	127 (84.66)	248 (82.66)	0.83	II
3.	First aid for common disease like Tympany, Acidosis, Indigestion etc.	134 (89.33)	101 (67.33)	235 (78.33)	0.78	IV
4.	Timely treatment of weak and sick animal	131 (87.33)	124 (82.66)	255 (85.00)	0.85	I
5.	Vaccination of animal for FMD, HS, BQ, brucellosis, LSD etc.	121 (80.66)	114 (76.00)	235 (78.33)	0.78	IV
6.	Practicing de-worming in calf for prevention of internal parasite	86 (57.33)	76 (50.66)	162 (54.00)	0.54	VI
7.	De-worming in milking animal	113 (75.33)	110 (73.33)	223 (77.66)	0.78	IV
8.	Tick control	116 (77.33)	101 (67.33)	217 (72.33)	0.72	V
9.	Maintain Health Record	72 (48.00)	69 (46.00)	141 (47.00)	0.47	VII
	Mean	13.48	12.41			
Clean milk production						
1.	Keeping animal in clean and dry place	128 (85.33)	133 (88.66)	261 (87.00)	0.87	I
2.	Washing udder with luke warm water or antiseptic solution before milking	117 (78.00)	105 (70.00)	222 (74.00)	0.74	III
3.	Testing milk for subclinical mastitis	78 (52.00)	66 (44.00)	144 (48.00)	0.48	VIII
4.	Timely treatment for mastitis	124 (82.66)	117 (78.00)	241 (80.33)	0.80	II
5.	Proper disposal mastitis milk	105 (70.00)	97 (64.66)	202 (67.33)	0.67	IV
6.	Proper drying off milking animal	98 (65.33)	96 (64.00)	193 (64.33)	0.64	V
7.	Transfer of milk to refrigeration immediate after milking	82 (54.66)	97 (64.66)	179 (59.66)	0.60	VI
8.	Keeping milk utensil clean and hygienic condition	104 (69.33)	96 (64.00)	200 (66.66)	0.67	IV
9.	Dry cow therapy	91 (60.66)	79 (52.66)	170 (56.66)	0.57	VII
	Mean	12.82	12.7			

Conclusion

Overall adoption of clean milk production and health management were very poor followed in trainees and non-trainees' group so, it is recommended KVK must be trailed program by considering improved and advance clean milk production and healthcare management practices. Animal management practices and feeding practices are higher adopted by trainees compared to non-trainees' group. This is key element of success of training conducted by KVK. So, the more emphasis has to give on animal management

practices and feeding practices with the help of veterinary doctor, subject matter specialist, extension person, cooperative society working in locality. They may give advice to the farmers for better output of dairy farm.

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