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Dairy farmers' knowledge of improved dairy farming practices: A study in Kumaon division of Uttarakhand

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Abstract

Dairy farming has been an integral component of agricultural in India as it plays a critical role in sustainability of rural livelihoods and provides insurance to farmers in case of crop failure. However, the updated knowledge of dairy farmers about improved dairy farming practices is very important for getting good economic returns. The major objective of study was to determine dairy farmers' knowledge about improved dairy farming practices. The knowledge of dairy farmers on five major areas of dairy farming (feeding, breeding, healthcare, general management and clean milk production practices) was determined using a standardized Knowledge Test. The study sample comprised 240 dairy farmers spread across eight villages in two districts of Kumaon division. Data was collected using structured interview schedule, and the respondents were personally interviewed by the researcher. The study findings revealed that 65 percent of the respondents displayed medium level of knowledge whereas 32.08 percent were having low and 2.92 percent high level of knowledge regarding improved dairy farming, respectively. Thus, in order to increase milk productivity, we need to undertake extensive efforts to improve their knowledge.

Keywords: Animal husbandry, dairy farming, improved dairy farming practices, dairy farmers, Uttarakhand dairy

Introduction

India is a leading country in global milk production contributing an annual milk production of 202.5 million tons in 2022 (NDDDB, 2022) ^[4] which accounts for 23 percent of world production. Dairy farming is second largest economical activity in rural India next to agriculture (Sabapara *et al.*, 2013) ^[8]. More than 80 percent of rural families keep cattle that provide milk for consumption, with additional income from sale of milk and drought power for agriculture; thus dairy sector significantly helps in poverty reduction in rural areas (Rahman and Gupta, 2015) ^[6]. Dairy farming plays a significant role in the rural economy by way of supplementing the income of rural households, particularly the marginal, small farmers and landless. It's also provides subsidiary occupation and improving socio-economic status of rural population. However, the major drawback of dairy farming in India is its low productivity in milk, less fat content in milk and disease outbreak. The major factor responsible for low productivity of milk could be due to traditional dairy farming by the dairy farmers (Kumar, *et al.* 2011) ^[2]. Inadequate nutrition, green fodder and dry fodder scarcity and lack of proper management of dairy farming are the main factor responsible for low milk production in animals (Ranjhan, 1994 and Meena, *et al.* 2014) ^[7, 3].

It is quite well recognized that for increasing production and productivity of dairy farming with the aim to make dairy enterprise more remunerative, it is essential to go for adoption of improved dairy farming practices in the field of breeding, feeding, health care, general management and clean milk production. There exist wide gaps between improved dairy farming practices and its adoption by dairy farmers. This can be due to lack of efficient information dissemination system, lack of compatibility; complexity and lack of observe ability of advanced practices relating to dairy farming. Due to this reason, farmers are unable to provide proper management dairy farming practices in their field. Therefore, keeping in view the above situation, it become important to determine knowledge of dairy farmers regarding improved dairy farming practices in Kumaon division of Uttarakhand.

Research Methodology

The study was carried out in two districts (Nainital and Udham Singh Nagar) of Kumaon division of Uttarakhand which were selected purposively (criteria being the highest milk production in Uttarakhand).

Later, two blocks (Haldwani and Ramnagar) from Nainital district and two blocks (Khatima and Rudrapur) from U. S. Nagar were selected purposively on the basis of maximum number of milk societies/ cooperatives. Further, Two villages (Naripur and Chorgaliya) from Haldwani block and Two villages (Bhaguwa Bangar and Puchhdi) from Ramnagar block of Nanital district were selected; and likewise two villages (Indrapur and Narayanpur) from Rudrapur block and two villages (Uchi mahuwa and Sarpura) from Khatima block of U. S. Nagar district were selected through random sampling without replacement. The study sample comprised of 30 dairy farmers selected from each village through random sampling method. Thus, total sample size for the present study was 240. The data were collected through pre-tested interview schedule.

A knowledge Test was developed to determine dairy farmers' knowledge about improved dairy practices. The respondents were asked to respond to statements as mentioned in Knowledge Test and the scores of correct (2), partial correct (1) and wrong answer (0), respectively. Later, scores for all respondents were calculated based on the formula given below. Knowledge was calculated by using the following formula

$$\text{Knowledge} = \frac{\text{Obtained score}}{\text{Maximum possible score}} \times 100$$

Weighted Mean Score was calculated by using formula

$$a_w = \frac{\sum mW}{W}$$

Thereafter, respondents were categorized as low, medium and high level of knowledge on the basis of maximum and minimum score. The knowledge level of the respondents was confined to five dimensions of improved dairy farming practices i.e. feeding, breeding, healthcare, general management practices and clan milk production practices. Then, collected data were tabulated, analyzed and interpreted with the help of appropriate statistical tools.

Result & Discussion

(a). Profile characteristics of dairy farmers

It is clear from the data in table-1 that most of the dairy farmers (65%) were middle aged (35-55 years) followed by 21 percent old (more than 55 years) and 13 percent were young (less than 35 Years). Gender-wise composition of the study sample reveals that 56.67 percent were males and 43.33 percent were females. As regards education among the dairy farmers, about 27 percent were educated up to primary, 26.67 percent educated up to high school, 17 % upto Intermediate and 18.75 percent were graduates & above. As regards family size, 80.42 percent had small family size (less than 7 members); and 54.17 percent of the respondent had medium experience (23-41 years) of dairy farming and majority of them (70.42 %) had medium herd size (4-6 animals).

Table 1: Distribution of respondents on the basis of Profile characteristics (n=240)

Profile Characteristic	Category	Frequency	Percentage
1. Age	Young (Less than 35)	32	13.33
	Middle (35 - 55)	156	65.00
	Old (More than 55)	52	21.67
2. Gender	Male	136	56.67
	Female	104	43.33
3. Education	Illiterate	25	10.42
	Primary	65	27.08
	High school	64	26.67
	Intermediate	41	17.08
	Graduate & Above	45	18.75
4. Family Size	Small (Less than 7)	193	80.42
	Medium (7-13)	36	15.00
	Large (More than 13)	11	4.58
5. Dairying Farming Experience	Low (Less than 23)	88	36.67
	Medium (23-41)	130	54.17
	High (More than 41)	22	9.16
6. Herd Size	Small (less than 4)	63	26.25
	Medium (4 - 6)	169	70.42
	Large(more than 6)	8	3.33

(b). Knowledge about improved dairy farming practices:

Data regarding respondents' knowledge about recommended dairy husbandry practices are presented in Table-2. These practices were grouped under five categories, viz. feeding

practices, breeding practices, healthcare management, general management practices and clean milk production; and then each practice under different category was ranked by the respondents.

Table 2: Distribution of respondents according to their knowledge about recommended dairy farming practices (n=240)

SI. No.	Knowledge items	Knowledge			Weighted Mean Score	Rank
		Correct Knowledge Frequency (%)	Partial knowledge Frequency (%)	Incorrect Knowledge Frequency (%)		
(a). Feeding Practices						
1.	Feeding of colostrums to new born calf	105 (43.75)	84 (35.00)	51 (21.25)	2.23	II
2.	Practice to feed the newly born calf with concentrate	172 (71.50)	42 (17.50)	26 (10.83)	2.61	I
3.	Preparation of concentrate feed by using local ingredients	137 (57.08)	19 (7.91)	84 (35.00)	2.22	III
4.	Importance of additional concentrate feed to pregnant cow/buffalo in the advanced stage of pregnancy	106 (44.17)	62 (25.83)	72 (30.00)	2.14	VII
5.	Quantity of green fodder given to an adult animal daily	112 (46.67)	56 (23.33)	72 (30.00)	2.17	VI
6.	Quantity of dry fodder given to an adult animal daily	100 (41.67)	90 (37.50)	55 (22.92)	2.19	V
7.	Quantity of mineral mixture added in daily ration	120 (50.00)	50 (20.83)	70 (29.17)	2.21	IV
(b). Breeding practices						
1.	Age at first heat (190)	147 (61.25)	43 (17.92)	50 (20.83)	2.40	III
2.	Symptoms of heat detection	229 (95.51)	4 (1.67)	7 (2.92)	2.93	II
3.	Period of insemination after normal calving	23 (9.58)	118 (49.17)	99 (41.25)	1.68	V
4.	Importance of A.I (Artificial insemination)	135 (56.25)	50 (20.83)	55 (22.92)	2.33	IV
5.	Right time for A.I / service	231 (96.25)	8 (3.33)	1 (0.42)	2.96	I
(c). Health care						
1.	Prevention of calf scour / navel ill	95 (39.58)	54 (22.50)	91 (37.92)	2.02	IV
2.	Symptoms of metabolic disease like Milk fever, Ketosis etc	138 (57.50)	52 (21.67)	50 (20.83)	2.37	III
3.	Deworming schedule for calf and adult animals	69 (28.75)	81 (33.75)	90 (37.50)	1.91	V
4.	Symptoms of foot and mouth disease	193 (80.42)	17 (7.08)	30 (12.50)	3.33	I
5.	Vaccination schedule for calf and adult animals	163 (67.92)	17 (7.08)	60 (25.00)	2.43	II
(d). General management						
1.	Method of Umbilical card ligation	35 (14.58)	65 (27.08)	140 (58.33)	1.56	VI
2.	Dehorning of newly born calf	108 (45.00)	82 (34.17)	50 (20.83)	2.24	IV
3.	Importance of isolation of sick animals	220 (91.67)	20 (8.33)	00 (00)	2.92	I
4.	Knowledge about high yielding varieties of fodder	132 (55.00)	38 (15.83)	70 (29.17)	2.26	III
5.	Characteristics of cleaning of cattle shed	100 (41.67)	32 (13.33)	108 (45.00)	1.97	V
6.	Control of ectoparasites	132 (55.00)	67 (27.92)	41 (17.08)	2.38	II
(e). Clean milk production						
1.	Importance of washing the udder before milking	222 (92.50)	8 (3.33)	10 (4.17)	2.88	I
2.	Cleaning the utensils with boiled water or detergent before milking	156 (65.00)	24 (10.00)	60 (25.00)	2.40	III
3.	Cleanliness of the shed	150 (62.50)	59 (24.58)	31 (12.92)	2.50	II
4.	Avoiding the first few streams of milk from each teat while milking	128 (53.33)	31 (12.92)	81 (33.75)	2.20	V
5.	Right method of milking	121 (50.42)	45 (18.75)	74 (30.83)	2.20	V
6.	Importance of dry period	138 (57.50)	46 (19.17)	56 (23.33)	2.34	IV

(1) Feeding Practices

Table-2 indicated that under feeding practices, most of the respondents possessed knowledge about practice to feed the newly born calf with concentrate (WMS=2.61, 1st rank), followed by knowledge about feeding of colostrums to newborn calf (WMS=2.23, 2nd rank), preparation of concentrate feed by using local ingredients (WMS=2.22, 3rd rank). Further, quantity of mineral mixture added in daily ration (WMS=2.21, 4th rank), knowledge about quantity of dry fodder given to an adult animal daily (WMS=2.19, 5th rank), quantity of green fodder given to an adult animal daily (WMS=2.17, 6th rank), and importance of additional concentrate feed to pregnant cow/buffalo in the advanced stage of pregnancy (WMS=2.14, 7th rank).

(2) Breeding Practices

With respect to breeding practices, Table-2 revealed that almost all respondents possessed knowledge about right time for artificial insemination (A.I) / service (WMS=2.96, 1st rank) followed by symptoms of heat detection (WMS=2.93, 2nd rank) and knowledge about age at first heat (WMS=2.40, 3rd rank). Further, knowledge about importance of artificial insemination (WMS=2.33, 4th rank) and knowledge about period of insemination after normal calving (WMS=1.68, 5th rank).

(3) Health Care Practices

With respect to health care, Table 1 indicated that vast majority of the respondents had knowledge about the symptoms of foot and mouth disease (WMS=3.33) and rank 1st, followed by knowledge about vaccination schedule for calf and adult animals (WMS=2.43) and rank 2nd, symptoms

of metabolic disease like Milk fever, Ketosis etc (WMS=2.37) and 3rd rank and. The knowledge about prevention of calf scour / navel ill (WMS=2.02) and rank 4th and deworming schedule for calf and adult animals (WMS=1.91) and rank 5th.

(4) General Management Practices

With regard to the general management practices in dairying, Table 1 revealed that all the respondents had knowledge about importance of isolation of sick animals (WMS=2.92) and rank 1st followed by knowledge about control of ectoparasites (WMS=2.38) rank 2nd, knowledge about high yielding varieties of fodder (WMS=2.26) and 3rd, dehorning of newly born calf (WMS=2.24) and rank 4th, knowledge about characteristics of cleaning of cattle shed (WMS=1.97) and rank 5th and knowledge about method of umbilical cord ligation (WMS=1.56) and 7th.

(5) Clean Milk Production Practices

As for as the knowledge domain of clean milk production is concerned, Table 1 revealed that nearly all of the respondents had knowledge on the importance of washing the udder before milking (WMS=2.88) and rank 1st, followed by cleanliness of the shed (WMS=2.50) and rank 2nd, cleaning the utensils with boiled water or detergent before milking (WMS=2.40) and rank 3rd, importance of dry period (WMS=2.34) and rank 4th, right method of milking and avoiding the first few streams of milk from each teat while milking both had same (WMS=2.20) and rank 5th.

(c). Overall Knowledge of dairy farmers regarding improved dairy farming practices:

Table 3: Distribution of the respondents on the basis of improved dairy farming practices

Sl. No.	Aspects	Category	Frequency	Percentage (%)
1.	Feeding	Low (<57.14)	61	25.42
		Medium (57.14-78.57)	118	49.17
		High (>78.57)	61	25.42
2.	Breeding	Low (<53.33)	20	8.33
		Medium (53.33-76.67)	97	40.42
		High (>76.67)	123	51.25
3.	Healthcare	Low (<53.33)	76	31.67
		Medium (53.33-76.67)	99	41.25
		High (76.67)	65	27.08
4.	General Management	Low (<55.55)	75	31.25
		Medium (55.55-77.78)	134	55.83
		High (>77.78)	31	12.92
5.	Clean milk	Low (<55.55)	47	19.58
		Medium (55.55-77.78)	115	47.92
		High (>77.78)	78	32.50
6.	Over all	Low (<63.76)	77	32.08
		Medium (63.76-81.07)	156	65.00
		High (>81.07)	7	2.92

Study findings presented in table-3 reveals that majority of the respondents (65%) had medium level of knowledge of improved management practices followed by 32.08 percent with low level of knowledge respectively and remaining 2.92 percent of the respondents displaying high level of knowledge of improve management practices.

Further, under different categories of practices, it is evident from the above table that under feeding practices, 49.17 % respondents had medium knowledge and about 25.42 percent having high and an equal percentage of dairy farmers

displaying low knowledge. Regarding breeding practices, 51.25 percent of respondents had high and 40.42 percent had medium knowledge. In respect of healthcare management, 41.25 percent had medium and 31.67 percent having low knowledge; regarding general management practices, 55.83 percent had medium knowledge and 31.25 percent had low knowledge, and regarding clean milk production practices, 47.92 percent had medium and 32.5 percent had high knowledge.

This may be due to the fact that, majority of the respondents in the study area had taken up dairying as a familial occupation. The findings are in line with Patil (2018)^[5] and Kavithaa *et al.* (2020)^[11] who found that majority of the respondents had medium level of knowledge (68.34% and 53.33%).

Conclusion

Increasing milk productivity, production efficiency and profitability requires high knowledge about improved dairy farming practices. The present study has revealed that majority of the respondents (65%) had medium knowledge regarding improved dairy farming practices. We need to undertake intensive efforts with relevant media strategies to spread the awareness and the subsequent adoption of scientific dairy farming by all categories of dairy farmers. Therefore, government department through Veterinary officers, Dairy Development officers along with KVKs must periodically conduct trainings and awareness programmes on various aspects of dairy farming, especially on feeding, breeding, healthcare management and clean milk production practices etc to update their knowledge. Consequently, India can improve milk productivity and production efficiency of its large livestock population and contribute more in nation's GDP. Relevant policies and programmes needs be formulated to achieve the desired results.

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