

Assessment of Training Needs Among Dairy Cattle Farmers in Oyo State, Nigeria

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Abstract

The training needs of dairy cattle farmers in Oyo state, Nigeria were assessed. A well-structured interview schedule was used to obtain information from 123 respondents. Data were collected on socio-economic characteristics of the respondents, their dairy cattle production enterprises and their training needs which were ascertained in six major areas of cattle production: feeding, breeding, healthcare, housing and management, marketing and finance, product preparation and processing. Data were subjected to descriptive statistics and regression analysis using SPSS (V.21). Results revealed that most (30.1%) of the respondents were 24 – 29 years old, married, were male, had no formal education. Results also revealed that more than 90% of dairy cattle farmers perceived the training needs in feeding as most important. The training index in dairy farming indicated that majority (91.8%) of the farmers needed to be trained more on dairy cattle production and management. Based on the result of this study, it was concluded that breeding, feeding and health care were perceived as the “most needed” training by the respondents. Although, training need in marketing and finance, milk preparation and processing, as well as housing and management were also perceived as important. Furthermore age, sex, marital status, religion, education level, source of flock, purpose of production and breeds of cattle had a direct effect on training needs of the respondent while occupation, household, herd size, had an indirect effect on training need of the respondents.

Keywords: Cattle, dairy farmers, production, training index, training needs

1. Introduction

Livestock industry accounts for 3.8 percent of the Gross Domestic Product (GDP); with the dairy sub-sector contributing 30 percent of this output (Njombe et al., 2010). Dairy sub-sector contribution is not only limited to its share to total GDP but also play other important roles such as improving food security and welfare, creating employment, generates reliable income to meet household livelihoods (Somda et al., 2005). FAO (2010) reported that dairy industry in Nigeria produces an estimate of 450, 000 tons of milk per annum. This production has been found to be inadequate to satisfy the dairy demands of Nigerians, FAO (2010), this is because the genotype of the African breeds of cattle can only produce an average milk of 1.27 litres per cow per day during the wet season and less than 0.36 during dry season (Yuan et al., 2010), whereas their counterparts in the European and American countries produce an average of 25 litres per day (Mallau-Aduli, et al., 2009).

Nigeria is one of the leading countries in cattle production in Sub-Saharan Africa. Tibi and Aphunu (2010) reported that the country had over 14.73 million cattle consisting of 1.47 million milking cows and 13.26 million beef cattle. Less than 1% of this population is managed commercially, while about 99% is managed traditionally. Under the traditional system, there is the use of indigenous methods in all aspects of cattle production including health management (Mafimisebi et al. 2012). This tilt towards traditional management continues to have grave implications for commercialization of the production of cattle and cattle products as well as their prices in Nigeria (Abubakar and Garba, 2004).

A farmer being a rational decision maker normally strives for a better standard of living and seeks ways of adopting new technologies to accomplish the set goals (Murai and Singh, 2011). Training in agricultural related practice improves farmers’ ability to acquire accurate information, evaluate new production processes, use improved husbandry practices and these benefits translate into adoption if a set of enabling factors and conditions exists to train the farmers (Adesina and Zinnah, 1993). Effective dissemination of improved dairy husbandry practices

through training is an important strategy for increasing adoption; it creates awareness and competence in the target audience about innovations (Thapa, 2003).

Farmers' training is a process of imparting specific skills to farmers that let them better perform their farm production activities and become more competent and proficient in doing their farm work (Imaita, 2013). Many studies have demonstrated high economic returns to investment in improved husbandry practices through extension and training despite the difficulty of isolating its impact on agricultural productivity and growth from other factors (Khan et al., 2009). According to FAO (2011) farmers' training aims at communicating information, knowledge and skills, replacing old attitudes by new ones, exchanging opinions and experiences and reducing the amount of perceived complexity in a technology thereby creating a desired change. Effective dissemination of improved dairy husbandry practices through training is an important strategy for increasing adoption; it creates awareness and competence in the target audience about innovations (Thapa, 2003).

According to Rivara et al (2004), good management practices in terms of adequate nutrition, disease prevention, control and breeding are essential for improved dairy production. Although the productivity of dairy in Nigeria is low there is ample opportunity for improvement which can be achieved through extension education and training of dairy farmers. However, such extension education and training can only be effective if the training needs of the dairy farmers are properly identified. Thus, this study sought to assess training needs among dairy cattle farmers in Oyo state, Nigeria.

2. Method

The study was conducted in Oyo State; it is located in the South-West geopolitical zone of Nigeria. It consists of 33 Local Government Areas (LGAs). The State covers a land area of 28,454 square kilometers with a population of 5.6 million people NPC (2006) with climatic conditions that favour agriculture. The wet season is from April to October, with the mean temperature of 27°C. The dry season is between November and March. The mean annual rainfall is 1,194mm in the North and 1,264mm in the South. Within Oyo state, the Zebu cattle (White Fulani and other Zebu breeds) are herded in the lowlands, amidst land progressively used for crop production. The major crops grown in the state include cassava, maize, yam, sorghum, cocoa, cocoyam, melon, peppers, soybean and okro; major livestock reared in the state include; cattle, sheep, goat and poultry.

A two-stage sampling procedure was adopted for this study. The first stage involved purposive selection of nine local government areas (LGAs) where dairy farmers were predominant in the State. The areas are Ido, Iseyin, Lagelu, Saki, East, Saki West, Ibarapa East, Oyo West Itesiwaju, and Ogbomosho North. List of these farmers was generated in each of these LGA from their Associations (Miyeti Allah Cattle Breeders Association - MACBAN). The second stage involved random selection of at least 10 members from the list in each of the LGA to give 123 respondents. A well-structured interview schedule was used to obtain information from these respondents. Data were collected on socio-economic characteristics of the respondents, their dairy cattle production enterprises and training needs of farmers which were ascertained in six major areas viz., feeding, breeding, healthcare, housing and management, marketing and finance, product preparation and processing. The areas were assessed on three point's continuum which were: most important, important, and least important, with the scores of 3, 2 and 1, respectively as reported by Balaraju et al., (2004). The major areas were further classified into sub-areas and the training needs of dairy farmers were ascertained at three point continuum viz., most needed, needed and least needed, with the score of 3, 2 and 1, respectively (Balaraju et al., 2004).

Frequency and percentage for each major area were calculated and ranking was done for each category based on the total weighted mean score. The summation of scores achieved by the respondents constituted the level of perceived training needs. The extent of training needs was calculated based on the "Training Need Index (TNI)" formula which was individually calculated on each sub-area. The summation of scores was further categorized as low, medium and high level training needs as perceived by the farmers. The total weighted mean score and TNI were calculated using the following formula:

$$\text{Total weighed mean score (TWMS)} = \frac{\text{Total score obtained by each major area}}{\text{Total number of respondent}}$$

$$\text{Training needs index (TNI)} = \frac{\text{Total obtained score}}{\text{Maximum obtainable score}} \times 100 \quad (\text{Balaraju et al., 2004})$$

Data were subjected to Descriptive Statistics (Mean, Frequency and Percentage) and Regression Analysis using SPSS (V.21).

3. Results

Table 1 shows the socio economic characteristics of dairy cattle farmers. Results revealed that most of the respondents were within the age range of 24-29 years (30.1%), followed by those within range of 30 – 34 years (19.5%) and the least were those who were within age of 20 – 24 years (18.7%) and those who were older than 35 years (8.9%). Mean age of the respondents was 34.7 years. Majority of the respondents were male (51.2%) while 48.8% were females. Most of them were married (56.7%). All of the respondents were Muslims with most (74%) having no formal education, 18.7% of them had primary education, few (6.5%) of the respondents had secondary education. The result of household size of respondents showed that majority of the respondents had household size between 6 – 9 members (47.2%), 26.0% had household size of between 2-5 members, while 18.7% had household size of between 10-13 members, the least was obtained in those with household size greater than 13 members (8.1%). The mean household size was 17. The result further revealed that majority (52.0%) of the respondents earned more than N18,000 – N 23, 000 (52.0%) as income followed by those who earned between N24, 000 – 29, 000 (21.1%), N 30, 000- 35, 000 (15.4%), and those that earn N35,000 – N40,000 (8.1%), the least were those who earned more than N40,000.

Table 1. Socio- economic characteristics of the respondents

Variables	Frequency	Percentage	Mean
Age (Years)			
<20	17	13.8	
20 – 24	11	8.9	
25 – 29	37	30.1	34.7
30 – 34	24	19.5	
35 – 39	23	18.7	
>39	11	8.9	
Sex			
Male	63	51.2	
Female	60	48.8	
Marital Status			
Single	25	20.3	
Married	91	74.0	
Divorced	1	0.8	
Widowed	6	4.9	
Educational level			
No formal Education	91	74.0	
Primary education	23	18.7	
Secondary education	8	6.5	
Tertiary education	1	0.8	
House hold size			
2 – 5	32	26.0	
6 – 9	58	47.2	
10 – 13	23	18.7	17
>13	10	8.1	
Income (#)			
18 – 23,000	64	52.0	
24 – 29,000	26	21.1	
30 – 35,000	19	15.4	17,700.89
35 – 40,00	10	8.1	
40,000	6	3.2	

Dairy cattle production characteristics of the respondents are presented in Table 2. Results revealed the sources by which respondents got their cattle. These sources ranged from farm, Research Institutes and inheritance. The result revealed that more than half of the respondents got their cattle through inheritance (98.4%); few respondents also got their cattle from Research Institutes (0.8%) and farm (0.8%). The result showed that main purpose of cattle production among the respondent was for income generation (91.1%), while the least purpose of production of the

respondent was for consumption (8.9%). It was further shown that most of the respondents had between 16 – 20 cattle (26.8%), 22.8% had greater than 49 cattle, 22.0% had 10-15 cattle, 12.2% had 28-33 cattle, 11.4% had 22-27 cattle, while 4.9% had less than 10 cattle. Majority (81.7%) of the respondents possess White Fulani cattle, 5.0% of the respondent reared Red Bororo and White Fulani, 4.2% of the respondent owned White Fulani and Sokoto Gudhali.

Table 2. Dairy cattle production characteristics of the respondents

Variables	Frequency	Percentage	Mean
Sources of flock			
Farm	1	0.8	
Research institute	1	0.8	
Inherited	121	98.4	
Purpose of production			
Income generation	112	91.1	
Consumption	11	8.9	
Herd size			
Less than 10	6	4.9	
10 – 15	27	22.0	
16 – 20	33	26.8	
22 – 27	14	11.4	52
28 – 33	15	12.2	
More than 49	28	22.8	
Breeds			
Red Bororo	2	1.7	
White Fulani	98	81.7	
Muturu	2	1.7	
Red Bororo and white Fulani	6	5.0	
White Fulani and Muturu	1	0.8	
White Fulani and Sokoto gudali	5	4.2	
White Fulani and Ndama	1	0.8	
Red Bororo, white Fulani and Ndama	5	4.2	

The training needs of farmers in major areas of dairy cattle production is presented in Table 3. Results revealed that almost all (90%) of dairy cattle farmers perceived the training needs in Feeding as most important followed by Breeding and Health care with ranks VII, VI and V respectively. Majority of farmers perception was between “Most important” to “Important” for the areas of Housing and Management, Marketing and Finance as well as milk Preparation and Processing. However, Housing and Management, Marketing and Finance as well as milk Preparation and Processing were ranked III, IV and II respectively. Majority of the farmers perceived training needs in Biosecurity as least important which was ranked I.

Table 3. Training needs of farmers in major areas in dairy cattle production

Variables	MI (%)	I (%)	LI (%)	TS	TWMS	Rank
Breeding	117(95.1)	5(4.1)	1(0.8)	130	2.71	VI
Feeding	121(98.4)	2(1.6)	-	125	2.60	VII
Healthcare	113(91.9)	10(8.1)	-	131	2.73	V
Housing and management	50(40.7)	54(43.9)	19(15.4)	215	4.53	III
Marketing and finance	49(39.8)	71(57.7)	3(2.4)	200	4.30	IV
Milking and milk processing	44(35.8)	67(54.5)	12(9.7)	211	4.53	II
Biosecurity	8(6.5)	7(5.7)	108(87.8)	346	6.61	I

MI- most important, I- important, LI- least important, TS- total score, TWMS- total weighted mean score.

Presented in Table 4 are the training needs of farmers in different sub-areas of dairy cattle farming. Within the sub area of breeding, artificial insemination was ranked first, followed by estrous detection, heat detection and estrous cycle and time mating. With respect to feeding of dairy cattle; more than 40% of respondents perceived training as “needed” in all the five sub-areas of feeding. Majority (3.58%) of the respondents recognized mineral mixture supplementation as “most needed” followed by balance ration and its composition (3.16%) and feeding of different age group of the cattle (2.40%) with rank I, II, and III respectively. Result on dairy cattle health care indicated that more than half of the respondents recognized training needs in common disease and preventive measures (1.92%), vaccination (1.77%), improved health management (1.51%), ecto-parasites control (1.48%), deworming (1.27%) as “most needed” and were ranked as I, II, III, IV, and V.

In dairy development programme; artificial insemination service ranked first, followed by use of reproductive technologies, ration formulation, modern branding, improvement of grazing management, improved milk yield, creep feed calves when pasture quality is poor, improved dairy production, modern means of animal identification, pregnancy diagnosis, and cross breeding. In housing and management; construction of low cost scientific housing ranked first, followed by manure management (rank II) and record keeping (rank III). Furthermore, care and management of productive animals, identification and isolation of sick animals were ranked IV and V respectively. For marketing and finance, majority of respondent (7.53%) determined training in banking and insurance as “most needed” followed by training needs in processing, sales of animal nutrition product, milking technology, storage of milk product, storage of milk, processing of milk for product with rank I, II, III, IV, V, VI and VII respectively.

Table 4. Training needs of farmers in different sub – areas of dairy cattle farming.

Variables	MN	N	LN	TS	TWMS	Rank
Training Needs In Breeding (%)						
Selection of breeds	121(98.4)	2(1.6)	-	125	2.66	VIII
Selection of breeding stock	75(61.0)	45(36.6)	3(2.4)	174	4.00	VI
Artificial insemination	1(0.8)	5(4.1)	117(95.1)	362	7.82	I
Identification of infertility in cattle	72(58.5)	51(41.5)	-	174	4.03	V
Estrous detection	27(22.0)	86(69.9)	10(8.1)	229	5.48	II
Estrous cycle and time mating	74(60.2)	45(36.6)	4(3.3)	176	4.07	IV
Heat detection	-	60(48.8)	1(0.8)	185	4.33	III
Pregnancy diagnosis	87(70.7)	3(28.35)	1(0.8)	160	3.62	VII
Training Needs In Feeding (%)						
Balance ration and its composition	14(114)	25(20.3)	84(68.3)	316	3.83	II
Feeding of different age group	29(236)	71(57.7)	23(18.7)	240	2.78	III
Nutritional management of breed problem	29(236)	79(64.2)	15(12.2)	232	2.63	IV
Importance of clean feed and water	115(93.5)	8(6.5)	-	131	1.34	V
Mineral mixture supplementation	2(1.6)	7(5.7)	114(92.7)	358	4.41	I
Training Need In Health Care %						
Deworming	120(97.6)	2(1.6)	1(0.8)	127	2.00	V
Vaccination	80(65.0)	32(26.0)	11(8.9)	177	2.69	II
Ectoparasite control	99(80.5)	23(18.7)	1(0.8)	148	2.31	IV
Common disease and preventive measures	55(44.7)	64(52.0)	4(3.2)	192	3.00	I
Improved health management	96(78.0)	26(21.1)	1(0.8)	151	4.63	III
Dairy development programme						
Modern means of animal identification	85(69.1)	31(25.2)	7(5.7)	168	5.22	IX
Cross breeding to improve quality cattle	99(80.5)	23(18.7)	1(0.8)	148	4.44	XI
Artificial insemination service	2(1.6)	6(4.9)	115(93.5)	359	11.13	I
Improved milk hygiene	63(51.2)	60(48.8)	-	183	5.82	VI
Ration formulation	48(39.0)	54(43.9)	21(17.1)	282	8.99	III
Creep feed calves	76(61.8)	46(37.4)	1(0.8)	171	5.35	VII
Improved diary production	72(58.5)	45(36.6)	6(4.9)	168	5.27	VIII

Uses of reproductive technologies	8(6.5)	32(26.0)	83(67.5)	321	10.17	II
Pregnancy diagnosis	63(51.2)	57(46.3)	17(13.8)	178	4.97	X
Improvement of grazing management	67(54.5)	52(42.3)	4(3.3)	183	5.83	V
Modern branding	64(52.0)	47(38.2)	12(9.8)	194	6.20	IV
Training Needs In Housing And Management						
Construction of low cost scientific housing	8(6.5)	35(28.5)	80(65.0)	318	4.01	I
Identification and isolation of sick animal	73(59.3)	43(35.0)	7(5.7)	180	1.99	V
Record keeping	38(30.9)	34(29.3)	49(9.8)	255	3.10	III
Manure management	7(5.7)	50(40.7)	64(52.0)	299	3.85	II
Care and management of productive animal.	63(51.2)	57(46.3)	17(13.8)	186	2.05	IV
Training Needs In Marketing And Finance (%)						
Sales of animal nutritionist product.	57(46.3)	49(39.8)	17(13.8)	197	3.44	III
Banking and insurance	63(51.2)	49(39.8)	11(8.9)	246	7.53	I
Training needs in processing	11(8.9)	111(90.2)	1(0.8)	238	4.35	II
Milking technology	54(43.9)	62(50.4)	7(5.7)	199	3.43	IV
Processing of milk for product	69(56.1)	45(36.6)	9(7.3)	186	3.13	VII
Storage of milk	63(51.2)	49(39.8)	11(8.9)	194	3.29	VI
Storage of milk product.	67(54.5)	35(28.5)	21(17.1)	200	3.36	V

MN- Most needed, N-Needed, LN- least needed, TS- Total Score, TWMS-Total Weighed Mean Score.

Table 5 shows the training needs index of dairy cattle farmers. The training index in dairy farming indicated that almost all (91.8%) of the farmers needed to be trained more on dairy cattle production and management while few (8.4%) of the respondents had low level of training needs.

Table 5. Training needs index of dairy cattle farmers

Training need index (%)	Frequency	Percentage
Low (<33.34 – 66.66)	10	8.4
High (>66.67)	133	91.8

Table 6 shows factors influencing training needs of dairy cattle production. Results revealed that age, source of flock inflow, purpose of production, flock size and breeds of cattle were significant ($p > 0.05$) factors influencing training needs of dairy cattle production of the respondent, while sex, marital status, religion, household size and income were not significant ($p < 0.05$) factors influencing training needs of dairy cattle production of the respondents. Also age, sex, marital status, religion, education level, source of flock inflow, purpose of production and breeds of cattle had positive direct effect on training needs of dairy cattle production of the respondents while occupation, household size, income had negative effect indirect effect on training needs of dairy cattle production of the respondents. The R^2 was 0.511

Table 6. Factors influencing training needs of dairy cattle production of the respondent.

Variables	B	Std. Error	t-value	p-value
Age	1.576	1.020	1.545	0.125
Sex	0.909	1.450	0.371	0.711
Marital status	1.377	2.195	0.627	0.532
Occupation	-1.343	1.739	-0.772	0.442
Religion	5.776	10.444	0.553	0.581
Educational level	2.976	1.534	1.942	0.055

Household size	-2.291	1.510	-1.517	0.132
Income	-0.5947	1.347	-0.435	0.664
Source of flock in flow	5.947	3.547	1.676	0.097
Purpose of production	0.036	1.209	0.030	0.976
Flock size	-0.416	1.112	-0.374	0.709
Breeds of cattle	6.023	7.325	0.822	0.413
$R^2 = 0.511$				

4. Discussion

Training needs among dairy farmers in Oyo state, Nigeria were assessed in this study. Result of age of respondents implies that majority of the respondent were still in their economically active ages. This agrees with the report of Popoola et al (2017) and it is an indication that agricultural production, particularly livestock production is a profession that is practiced by people of different age groups. Majority of the respondents were male, this is due to the fact that there is gender dimension to cattle production in Nigeria such that Nigerian pastoralists who are majorly Fulani tribe believe that large animals like cattle are can only be handled by men while small animals like sheep, goat, chicken are meant to be managed by women. Most of them were married; this is expected with result obtained for their age. The level of education of the respondents implies that majority of them cannot read and write; this may hinder better communication as well as adoption of innovations as reported by Asanwana, (2001); Popoola et al., (2017). Household size is an important variable that determines the total household food requirement and thus, affect per capita food consumption and household food security. The result of household size of respondents showed that majority of the respondents had household size between 6 – 9 members and the mean household size was 17. This result agrees with result of Adebisi et al. (2020) who also reported higher high members as the modal family size among households. The result further revealed that majority (52.0%) of the respondents earned more than N18,000 – N 23, 000 (52.0%) as income followed by those who earned between N24, 000 – 29, 000 (21.1%), N 30, 000- 35, 000 (15.4%), and those that earn N35,000 – N40,000 (8.1%), the least were those who earned more than N40,000. Differences in the income generated could be related to number of animals (herd size) possess by individuals.

Respondents obtained their cattle from different sources, these sources ranged from farm, research institute and inheritance. More than half of the respondents got their cattle through inheritance which implies that that cattle production is a means of lineage and succession business among the respondents who are largely Fulani pastoralists. The respondents raise their cattle for various purposes which range from income generation, meat production, milk production, consumption and as socio-cultural status; result of this study revealed that majority of respondents raised their cattle primarily for income generation. It was further shown that most of the respondents had between 16 – 20 cattle, followed by those who have more than 49 cattle; this implies that the difference in the number of cattle possess by individuals could be responsible for the differences in the income generated by the respondents. White Fulani is the breed of cattle mostly possessed by the respondents; this may because White Fulani is a cattle breed raised for dual purpose (milk and beef).

The training needs of farmers in major areas of dairy cattle production indicated their areas of priority in terms of training. Result revealed that majority of the farmers' perception was "most important" for areas of breeding, feeding and healthcare, while their perception for areas like housing and management, marketing and finance, milking and milk processing were between "most important" and "important". However, the perception of most of the dairy farmers on biosecurity was "least important". The result obtained for training needs of farmers in areas of Feeding, Breeding and Healthcare disagreed with the report of Tekale et al. (2013) who ranked Healthcare, Feeding and Marketing as I, II, and III respectively. In a study conducted on goat farmers, Mohan *et al.* (2006) reported similar findings.

The training needs of farmers in different sub-areas of dairy cattle farming was assessed which were determined in major areas of production such a s breeding, feeding, healthcare, dairy development programme, housing and management, marketing and finance. Within the sub area of breeding, artificial insemination was ranked first, followed by estrous detection, heat detection and estrous cycle and time mating. Artificial insemination was ranked first among the sub-areas where the training was needed because of inadequate technical know-how among the farmers. Result obtained from the respondents on sub-areas of dairy cattle healthcare indicated that respondent really needed training in all aspects of healthcare of their animals. In a similar study on small ruminants, Chah et

al., (2013) reported that majority of the farmers perceived training needs on common disease and preventive measures were the most needed. Respondents indicated high training needs in improved and assisted reproductive technologies of cattle production so as to improve the qualities of their cattle.

The overall involvement index of respondents was used as an indication of extent training needs of dairy cattle farmers. The index scores of Balaraju et al, (2014) was adopted which was ranged and scored as follows: index scores of range 0 – 33.33% which implies low training needs by the farmers; 34.33 – 66.66% implies medium training needs by the farmers and greater than 66.66% implies high training needs by the respondents. The overall training index in dairy farming indicated that majority of the farmers needed to be trained more on dairy cattle production and management. Similar findings were reported by Tekale et al., (2013); Chauhan and Kshirsagar (2012).

Result of factors influencing training needs of dairy cattle production revealed positive regression coefficient for age, sex, marital status, religion, educational level, sources of cattle, and purpose of cattle production and breeds of cattle raised by respondents. This implies that as the values of any of these variables increase, the extent of training needs of the dairy farmers will also increase. However there were negative regression coefficient for household size, income and flock size. This implies that increase in any of these variables will lead to decrease in extent of training needs by the respondents. The R^2 was 0.511 indicating that about 51.1% of the extent of training needs of respondents in dairy cattle production was explained by influence of their cattle production characteristics.

5. Conclusion

Based on the result of this study, it was concluded that breeding, feeding and health care were perceived as the “most needed” training by the respondents. Although, training need in marketing and finance, milk preparation and processing, as well as housing and management were also perceived as important. Furthermore age, sex, marital status, religion, education level, source of flock flow, purpose of production and breeds of cattle had a direct effect on training needs of the respondent while occupation, household, flock size, had an indirect effect on training need of the respondents. It is therefore recommended that there is need for establishment of famers’ training Institute specifically for dairy production to assess the training needs of dairy farmers’ holistically.

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