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Article

Analysing Entrepreneurial Behaviour, and Perception, of Farmers: A Study of Dairy Farm Management Practices in Kerala

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Abstract:

ABSTRACT

Commercial dairy farming has a fine prospect for employment throughout the year, being a source of liquidity. Due to the increase in milk demand, dairy farming is represented as one of the most important occupations and is also considered an entrepreneurial activity based on a commercial basis. Considering this fact, the present study was done in the Kollam district of Kerala to study the perception of dairy farmers in adopting management practices and the effects of socioeconomic factors on these practices. The relationship between these factors and the dairy farmers' entrepreneurial behaviour is also presented. A total of 150 respondents were chosen in the Kollam district of Kerala. For this paper, the proposed hypotheses have been exploited to create a structured questionnaire.

Moreover, the analysis is done using the Statistical Package for the Social Sciences (SPSS) for the attained data. The results revealed that socioeconomic factors significantly influence dairy farmers' management practices and entrepreneurial behaviour depending on their innovativeness and information-seeking behaviour on the dairy farm. Also, the study reveals that most dairy farmers had innovativeness and information-seeking behaviour with index values of 68.88 and 66.845, respectively. Finally, the analysis concludes that dairy farmers disagree with few scientific management practices and also possess a medium level of entrepreneurship behaviour.

Keywords: *Entrepreneurship; dairy farm; Kerala; management practices; socio-economic factors*

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Abbreviation

Abbreviation	Acronym
SCC	Somatic Cell Count
BMPs	Beneficial Management Practices
NY	New York
WI	Wisconsin
OGF	Organic, grass-fed
ECR	Energy Conversion Ratio
DTM	Dairy Tourism Model
HeECR	Human-Edible Gross Energy Conversion Ratio
SS	Sum of Squares
EBI	Entrepreneurial Behaviour Index
NDRI	National Dairy Research Institute

1. Introduction:

Globally, to extend the entrepreneurial base, entrepreneurship has been believed to be an effective tool for those with poverty-stricken financial resources or managerial backgrounds. Generally, the exact meaning of entrepreneurship is that one starts, manages, organizes the activities, and controls the business affairs unit by combining the production factors to supply the goods and services. An entrepreneur's origination is based upon intimately intertwined social, religious, cultural, psychological, and economic factors in communities (Amarnath & Samvel, 2008). For the rural economy, dairy farming is considered a crucial factor that is highly likely to make employment and income by increasing the yield of milch animals. For entrepreneurship progress in India, producing milch animals is considered the hopeful sector (Lazar, 2014). India is mainly an agrarian society wherein animal husbandry plays a significant role in an agricultural economy. In the socioeconomic development of India, animal Husbandry acts as a backbone. The livestock distribution is highly reasonable compared to that of land. Livestock farming needs minimum capital, and when compared with agriculture, the management and production expenses are minimal. Therefore, all farmers perform animal husbandry despite their economic status, and the livestock sector development would be more comprehensive (Planning Commission, 2012–17; Chandrasekar et al., 2017). Generally, dairy farming is a significant section of the worldwide food system, introducing nutritional, economic, and social advantages to a considerable percentage of the global population.

Agriculture can perform only during a specific period of the season. In contrast, dairy presents a steady income and off-season work, employing the rural population all year (Thankachan & Joseph, 2019). With a higher livestock population (512.05 million), India is blessed with extra-large livestock diversity encompassing approximately 57 % of the world's buffalo and 16% of the world's cattle population (GOI, 2018). Nevertheless, the country still faces a production failure due to the rise in demand from the rising population other than lower Indian cattle productivity (S et al., 2019). As per the Report of 2015, the population of milch animals is 676 thousand in Kerala. Also, in Kerala, the per capita milk availability reduced from 234 g/day in 2001-2002 to 203 g/day. In 2014-2015, milk production reduced from 2718 tonnes to 2711 tonnes, compared with 2001 to 2022 as per Report, 2015. This might be because of the non-flexibility of scientific dairying practices (Savale et al., 2017). In Kerala, the dairy sector faces several constraints, such as high input costs, low fodder development, and non-availability of grazing lands. Despite these negative aspects, it had established at least one institution to offer veterinary assistance in all panchayats in the state. Official government figures indicate that the state's milk production is soaring despite the reduction in the cattle population (George et al., 2018). In peri-urban areas, dairy farmers should have adequate knowledge and adopt enhanced dairy farming technologies to make the dairy business highly advantageous.

Hence, several efforts are being made to produce and distribute enhanced livestock practices or technologies to advance livestock productivity (S et al., 2019). Socioeconomic factors affect improved dairy management practices and decision-making processes (Belay et al., 2012). Thus, these factors will affect dairy production and management and, to a certain extent, the acceptance level of the farmers (Gunaseelan et al., 2017). Without a good understanding of these factors, involvement in the dairying business would be very difficult. In general, it is essential to consider socioeconomic factors that influence the improvement of mean, standard

deviation, percentiles, frequencies, and smallholder dairy production. In light of the above background, there is a need to understand the fundamentals of the present production parameters on dairy improvement in the study area for the development of appropriate and low-cost technologies which is compatible with the socioeconomic characteristics of the farmers and utilized to the advantage of the farmers to improve dairy production (Belay et al., 2012).

The main contribution of this paper is as follows:

- This study was performed in the Kollam district of Kerala state to know farmers' views on practising dairy management based on their socio-economic characteristics and their relationship with entrepreneurial behaviour.
- The study included 150 respondents to evaluate their perception of dairy management practices and socio-economic characteristics.
- The data collection is performed by presenting the questionnaire to the dairy farmers of the Kollam district in Kerala. Moreover, the statistical analysis is performed using the SPSS software.

The paper is arranged as follows: Section 2 describes the literature review associated with dairy farms and entrepreneurial behaviour. Section 3 describes a framework for the proposed hypothesis, and section 4 demonstrates the result and discussion using the SPSS. At last, section 5 summarizes the conclusion of the study.

2. Review of Literature:

In this heading, various works on dairy farm management practices and the entrepreneurial behaviour of the farmers were discussed.

Lai J et al. (Lai et al., 2018) examined how dairy managers categorise the management areas in their operations for further growth. A questionnaire was carried out from seven dairy farm management areas, including milking production, calf, financial planning, crop, risk, marketing of milk, and labour management. The analysis determined that well-built farms already placed higher prominence on employees, and labour management showed that they prioritised financial management for their achievement. In contrast, small farms needed more management outside of milking and production management. Sandrucci et al. (Sandrucci et al., 2019) surveyed 173 dairy goat farms in Northern Italy. It was performed to present a modernised view of practices in farm management.

The relationships between the herd traits, management factors, and milk production and excellence with a specific concentration on milk SCC and milk protein or fat deterioration condition were analysed. Regarding the deterioration of milk protein and fat conditions, the authors found a requirement to understand the phenomenon's genesis and its alleviation schemes. Factors other than feeding also deserve extensive awareness, particularly the high SCC influence. The influence of farm-specific BMPs on a set of complete environmental impacts was characterised by Kim D et al. (Kim et al., 2019) and quantified for two representative dairy farms in the Great Lakes region ("a large 1500-cow farm in NY and a smaller 150-cow farm in WI"). Even though this study recognised the adaptation of sustainable dairy production practices on individual impact profiles as advantageous, trade-offs between different impacts made the analysis highly complicated while considering the environmental impacts. A comparative study was conducted by Roy SK and Meena BS (Roy & Meena, 2020) to evaluate the dairy farmers' conventional diverse dairy farm management practices. This survey was conducted in the Karnal district of Haryana. For this analysis, the management practices concerning daily activities, calf management, milk management, and feed and fodder management were taken.

Fodor et al. (Fodor et al., 2018) examined the relationship between reproductive performance and management practices in Holstein cows on huge commercial dairy farms. In Hungary, the survey on cow management practices was conducted between May 2015 and November 2015 in 34 huge Holstein-Friesian dairy herds. Here, the relationship between reproductive performance and management practices was analysed by mixed-effects techniques. Snider MA et al. (Snider et al., 2021) conducted a study to assess information concerning present producer knowledge and production practices and recognise agronomic and social factors that might

influence milk production on OGF dairy farms in the United States. The outcomes of this study exhibited a requirement to model production and financial benchmarks, which assists OGF dairy producers in enhancing management practices such that economic supportability is improved. Berton M et al. (Berton et al., 2020) evaluated the effect of diverse Alpine farming systems on production efficiency (gross ECR), environmental footprint, and competition amid feed and food (potentially HeECR). The outcomes obtained were exploited to aid schemes and policies that aimed to endorse effective incorporation among mountain areas and dairy farming systems. Minhaj et al., 2019 studied constraints perceived by the farmers in the Doda district of Jammu and Kashmir. Here, the implementation of enhanced animal husbandry practices was performed. By employing a simple lottery technique, four blocks were randomly chosen. The adoption of animal husbandry practices enhanced productivity. Additionally, they presented the systemic model to generate empirical data on several socio-economic factors and constraints related to adopting scientific animal husbandry approaches.

Vanessa Ratten and Leo-Paul Dana (Ratten & Dana, 2017) conducted a case study using in-depth semi-structured interviews. It was performed to look into the sustainable entrepreneurial schemes for family farms. The study was conducted on dairy farms in Australia, in the west Victorian area. The findings recommended that family farms raise their regional determination and international standing by concentrating on their social, collaborative, and sustainable entrepreneurial schemes. Princejot Singh et al. (Singh & Hundal, 2015) studied the restraints faced by farmers in dairy adoption as entrepreneurship. In this study, 45 commercial dairy farmers of Punjab were chosen via a stratified random sampling approach and interviewed with a pre-tested questionnaire. The study showed that all the farmers entered a profession afterwards, receiving training in dairy farming. Carolien de Lauwere et al. and de Lauwere et al., (2018) exposed that dairy farmers in developing countries were still production-oriented. They mainly focused on expanding dairy production. The farmers had high proficiency levels, were highly optimistic about their future, were highly inclined to change, and were highly content with their family income and farm outcome. Investing in entrepreneurial competencies might assist farmers in coping with the challenges they are facing and keep their farms feasible.

Kuppusamy Ponnusamy et al. (Kuppusamy Ponnusamy & Meena, 2021) studied the aim of women-led entrepreneurship in dairying. This study was performed by utilising a structured interview schedule. Also, this study consists of 162 respondents working as field addition functionaries and agro-based entrepreneurs and academicians across the country. Tengli et al., (2019) conducted a study to recognise the scope for modelling the DTM. In 2016 and 2017, the study was performed in ICAR- NDRI, Karnal milking parlour premises. Here, the respondents were the milking parlour visitors. From 100 visitors, the data was gathered, and the study result was perturbed, where most respondents stated that dairy tourism had yet to evolve into other niche tourism. The perception of visitors regarding dairy tourism was different.

3. Analyzing the percipience of dairy farmers in management practices and their entrepreneurial behaviour in relation to socio-economic factors

3.1. Research Problem:

Dairy farming presents a source of daily income with a comparatively minimum level of risk. In India, numerous dairy farmers grow animals on a small scale in the usual manner (Landes et al., 2017). If the farmers scientifically run their businesses, then their productivity will be enhanced. Additionally, dairy farming can be considered a commercial, entrepreneurial activity as the most important occupation in urban regions, with higher milk demand. In dairy farming, most farmers must be aware of the recent techniques. Therefore, rather than make a profit, a few farmers will lose their investment (Jaiswal et al., 2018). To ensure the utmost profits and production, the farmers should use appropriate business plans and superior dairy management practices in dairy farming. From the opinion of dairy experts, one of the main issues dairy farmers face is animal welfare and hygiene, and the next one is raw milk marketing and dairy products. Hence, this states a significant gap between the private organisations and dairy farmers prioritising

smallholder farmers' issues. The dairy owners mostly face constraints in adopting reproduction practices, health care and disease management practices, financial and economic requirements, and difficulties in milking, marketing, storage, and distribution in the area. This paper considers the hypothesis that socioeconomic characteristics influence dairy farm management.

3.2. Research Questions:

The main aim of this paper is to exhibit the farmers' views on dairy farm management practices and the influence of socioeconomic factors on the entrepreneurship development of the dairy farmers of Kollam district, the state of Kerala, India. Therefore, the study's fundamental aim is to recognise farmers' insight views toward farm management practices, salient impacts of socioeconomic factors on entrepreneurship development in the study area, and to establish the productive prospects of a progressive dairy farm in the study area.

1. What management practices are followed by the dairy farm farmers to yield maximum production?
2. Do socioeconomic factors play a vital role in dairy farm management?
3. Can scientific management practices help dairy farmers manage their farms efficiently?
4. How to assess the level of entrepreneurship of dairy farmers?

3.3. Research Hypotheses:

H_1: The major constraint dairy farmers face depends on socioeconomic factors, like the higher cost of cattle feed and veterinary services.

The lack of finance for management practices, higher cost of raw material for dairy animal sheds, insufficient housing, and lack of appropriate knowledge of milk production economics are some of the socioeconomic factors and the important constraints selected to propose this hypothesis.

H_2: To make more efficient and sustainable milk production on a dairy farm, an assessment of the socioeconomic characteristics of farmers is necessary.

The socioeconomic characteristics of farmers affect the management practices, like the usage of milking machines, labour charges, etc., in milking production. Hence, this hypothesis intends to analyze the impact of socioeconomic factors on sustainable milk production.

H_3: Socioeconomic factors, such as income and education, contribute to dairy farms' health and feed management practices.

Hygiene, waste management, organic farming, and animal vaccination are significant practices for health management. However, these factors depend on the socioeconomic characteristics of farmers based on their income, availability of grasslands, etc. Hence, the hypothesis explains the importance of these characteristics in health and feed management practices.

H_4: Socioeconomic characteristics had a significant relationship with the extent of adoption of scientific dairy farming practices.

Adopting scientific management practices on the dairy farm is essential to determine the extent to which the information gained from the training programs has been applied. Thus, this hypothesis is proposed to analyse how the socioeconomic characteristics of dairy farmers affect scientific dairy farming practices.

H_5: Entrepreneurial behaviour is inclined by the socioeconomic traits of dairy farmers, like land holdings and income.

Landholding and annual income of dairy farmers had a positive and noteworthy relationship with their entrepreneurial behaviour. The reason to propose this hypothesis is that respondents with higher holdings would have more opportunities and possibilities to attempt and adopt several management practices, thus depending on their socioeconomic characteristics.

3.4. Framework of Hypothesis:

Figure 1 demonstrates the perception of farmers in management practices, such as scientific, health, and feed management, production, and marketing management practices, used in dairy farming and the relationship between socioeconomic factors in Entrepreneurship behaviour.

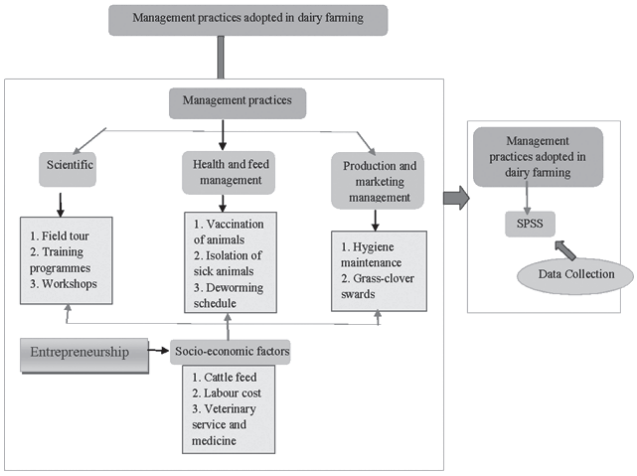


Figure 1. Framework of the research hypothesis

3.5. Variable Definition

Dependent variables: This is something that depends on certain factors. In our research, production and marketing practices, health and feed management practices, and scientific management practices are considered dependent variables.

Independent variables: The socioeconomic factor is considered the independent variable in this study.

3.6. Research Method

The research technique helps formulate the objectives and findings and presents the outcomes from the data collected throughout the study. The primary aim of the research approach is to direct the researcher in each phase to attain the study principles objective. Generally, the phases included in the study consist of reviewing the literature, forming the research question, developing the hypotheses, using techniques to collect the data, and data analysis. Thus, primary data collection was performed, and the study exploited first-hand information to identify the research issues and topics. This study blends descriptive, qualitative, and quantitative methodologies better to comprehend dairy farm management practices and socioeconomics with entrepreneurship. The descriptive technique is a research approach that investigates the characteristics of people and things. This technique is employed in the data collection stage to recognize and predict the correlations between and within the variables. By employing quantitative and qualitative analysis techniques, thoughts, concepts, views, and beliefs of the study object are linked. The main aim of this program is to develop improved dairy animal husbandry skills and to gain an enhanced knowledge of managing a commercial dairy farm based on different management practices and entrepreneurship activities.

3.5. Data Collection

This work has experienced a primary source of data collection. A structured questionnaire was employed as an instrument of data collection. The required sample was gathered by distributing the structured questionnaire to 150 dairy farmers in the Kollam district of Kerala. Also, the variables used for testing the proposed hypothesis were collected using a questionnaire. Each question was kept compulsory. The collected data was analysed using SPSS to reveal descriptive statistics, such as mean values, frequencies and percentages, and descriptive statistics.

3.6. Population of the study

In descriptive studies, it is a general practice to initially recognize a research population before directly observing a sample obtained from it. The population should be described so that those who are to be involved and excluded are clearly defined. The study has been carried out in the Kollam district of Kerala in India. The required information has been obtained to study the dairy farmer's perception of adopting management practices and the effects of socioeconomic factors on these practices. Also, 150 respondents responded to the provided questionnaire.

4. Analysis and Discussion

This study is based on the research questions and hypotheses to examine the management practices adopted in the dairy farms in Kollam district, Kerala. Five hypotheses were developed to validate the results. The proposed hypothesis uses SPSS for the analysis of the performance. The questionnaire comprises four sections: a) production and marketing practices, b) Health and feed management practices, c) Scientific management practices, and d) Socioeconomic factors.

4.1. Percentage Analysis

i. Evaluation of production and marketing management practices:

Table 1 describes the percentage assessment of production and marketing management practices. 84.7% of respondents strongly agree that purchasing animals from reliable sources with a veterinary doctor's consultation is valid. Then, 98.6% of respondents agree to ensure milk collection and transportation without undue delay. Also, 99.33% of respondents agree that exploiting a milking machine on a dairy farm is highly effective. While 40.7% of respondents agree that cows spending more time on grazing enhances the yield, 59.33% strongly agree. Conducting milk quality tests to ensure safety is strongly agreed upon by 69.33% of respondents. When most of the production and marketing practices are agreed upon by the respondents, a moderate state is found in a case: 61.33% of respondents agree, 25.33% of respondents either agree or disagree, and 13.33% of respondents strongly agree with maintaining a person (or group of people) in charge of quality management on the dairy farm.

Table 1: Percentage assessment of production and marketing management practices

Questions	Comments	Agree	Disagree	Moderate	Strongly agree	Strongly disagree
Q1	Purchasing animals from reliable sources with veterinary doctors' consultation is valid	15.3	-	-	84.7	-
Q2	Ensure milk collection and transportation without undue delay	98.6	-	-	1.33	-
Q3	Using a milking machine on the dairy farm is more effective	99.33	-	-	0.666	-
Q4	Cows spending more time a day on grazing improves the yield	40.7	-	-	59.33	-
Q5	Conducting milk quality tests assures safety	30	-	-	69.33	-
Q6	Maintaining a person (or group of people) in charge of quality management on the dairy farm is recommended	61.33	-	25.33	13.33	-

ii. Evaluation of health and feed management practices:

The percentage assessment of health and feed management practices is summarized in Table 2. It is found that 59.33% of respondents disagree that organic farming improves milk production, and 40.66% of respondents strongly disagree with the statement. 58.66 % of respondents agree that cleaning the animals with good-quality water helps maintain hygiene, and 40.66% strongly agree. The statement "clean and properly disinfect all materials and premises to avoid the risk of sickness" is agreed upon by 60.666% of respondents and strongly agreed upon by 39.33% of respondents. 67.33% of respondents agree, and 32.66% strongly agree that following a suitable waste management plan keeps the environment neat. The statement "Keeping and maintaining herd health and reproduction records" is disagreed with by 40% of respondents and strongly disagreed with by 38%. Meanwhile, 22% of respondents either agree or disagree with the statement. 76% of respondents agree, and 24% of respondents strongly agree that the vaccination of animals is a must.

Table 2: Percentage assessment of health and feed management practices

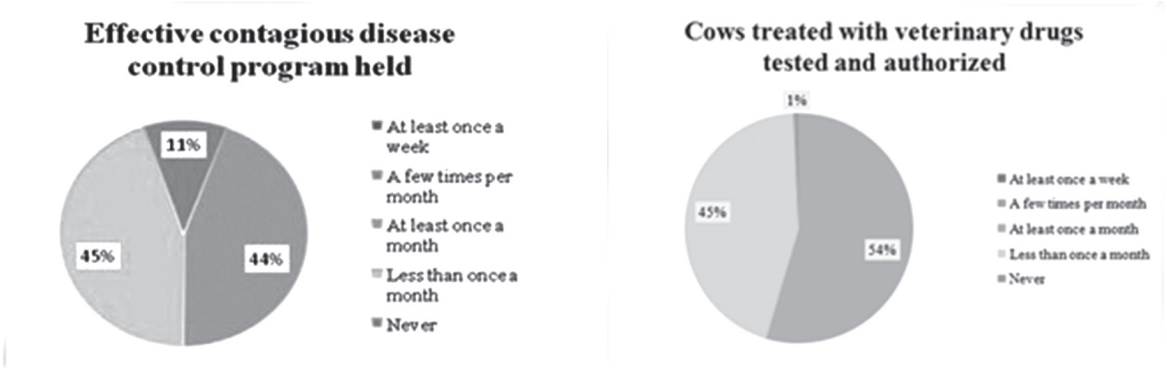
Questions	Comments	Agree	Disagree	Moderate	Strongly agree	Strongly disagree
Q1	Organic farming improves the milk production	-	59.33	-	-	40.66
Q2	Cleaning the animals with a good quality of water helps to maintain hygiene	58.66	-	-	40.66	-
Q3	Clean and properly disinfect all materials and premises to avoid the risk of sick	60.666	-	-	39.33	-
Q4	Following a suitable waste management plan keeps the environment neat	67.33	-	-	32.66	-
Q5	Keep and maintain herd health and reproduction records	-	40	22	-	38
Q6	Vaccination of animals is a must	76	-		74	-

iii. Evaluation of Scientific management practices

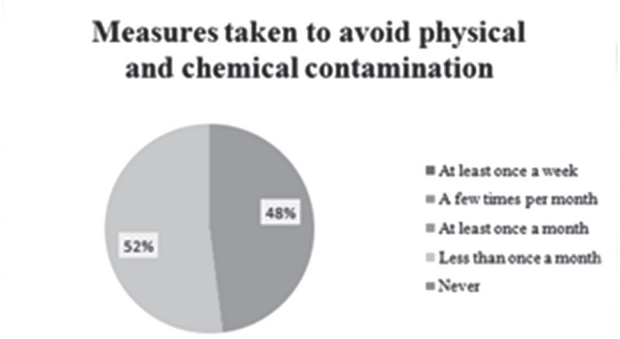
This section has been divided into two sets of practices, I and II, as one is on the option given based on the frequency, while the other is based on the farmer's opinion.

a) Scientific Management Practices I

Figure 2 demonstrates the percentage analysis of scientific management practices I. For the question, "Is there an effective contagious disease control program held?" 44% of respondents state that it is held at least once a month, 45% of respondents state less than once a month, and 11% of respondents never. When asked whether training was conducted for personal hygiene, 100% of respondents answered never. For the question, "Are the cows treated with veterinary drugs tested and authorized?" 45% of respondents stated at least once a month, 54% stated less than once a month, whereas 1% stated Never. While asking the question, "Are all the workers trained?" 100% of respondents answered never. For the statement, "Are measures taken to avoid physical and chemical contamination?" 52% of respondents stated at least once a month, and 48% stated less than once a month.



(a) **(b)**



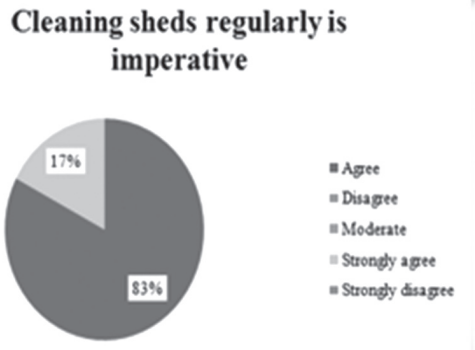
(c)

Figure 2: Pie Chart of Scientific Management Practices I

b) Scientific Management Practices II

The percentage analysis of scientific management practices II is shown in Figure 2. Here, 100% of respondents agree to follow improved breeding practices, like Artificial Insemination. Moreover, 55% of respondents agree that biogas production through waste management is a good practice that can be used for multiple purposes, and 45% strongly agree. For the statement "cleaning sheds regularly is imperative", 83% of respondents agree, and 17% strongly agree. 31% of respondents agree, and 69% strongly agree that preventing internal parasites is possible by practising a deworming schedule in calves. The statement "farmers must include various ingredients in cattle feed by understanding the nutrient requirements at different stages of cattle growth" is agreed upon by 98% and strongly agreed upon by 25% of respondents.

(a)



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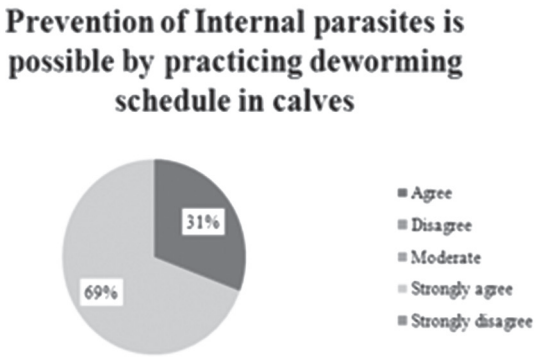

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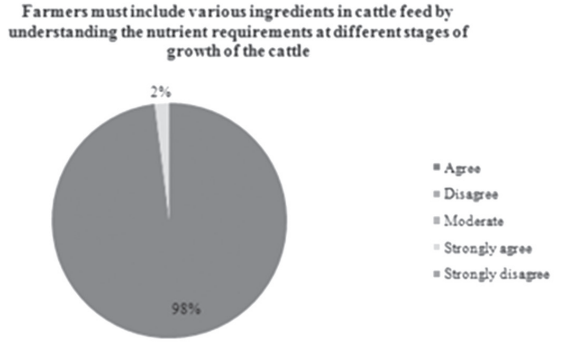

(d)

Figure 3: Pie Chart of Scientific Management Practices II

c) Evaluation of Socio-economic factors

Table 3 summarizes the percentage analysis of socio-economic factors. Here, the majority of the respondents (92.66%) are male, whereas 7.33% of respondents are female. All the respondents state that their farms contain below 15 lactating cows in their own dairying area. For the question, "Is dairy farming the main source of income?" 80.66% of respondents answered ''no'' while the remaining 19.33% said ''yes''. Moreover, most of the respondents (96%) have a second source of income, while the remaining (4%) do not. All the respondents said they do not get any financial support for their dairy business, and the cattle feed cost is not affordable. This clearly states that most management practices requiring the farmers' financial stability are less affordable. A few other factors responsible for Entrepreneurship analysis are discussed in the following section.

Table 3: Percentage analysis of socio-economic factors

Questions		Male	Female	
Q1	Gender	92.66	7.33	-
		Below 15	**15-25**	**Above 25**
Q2	How many lactating cows in the farm?	100	-	-
		Yes	**No**	
Q3	Is the total dairying area you own?	100	-	-
Q4	Is dairy farm the main source of income?	19.33	80.66	-
Q5	Do you have any second source of income?	96	4	-
Q6	Is there any financial support to your dairy business?	-	100	-
Q7	Is the cattle feed cost affordable?	-	100	-

The frequency analysis of socio-economic factors, like age, education, and annual income, is presented in Table 4.

a. **Age:** The young age group comprised of 41 to 45, and their frequency is 35.3%, whereas the middle age group comprised 46 to 54, which is 7.3%. From the Table, it is clear that most dairy farmers belonged to the old age group (55 and above) with a frequency of 57.3% because the adoption of several management practices is higher at the old age group than in the young and middle age group.

b. **Education:** Education is one of the essential components of behaviour and plays a vital role in influencing the entrepreneurial behaviour of dairy farmers. Out of 150 respondents involved in the study, 41.3% completed their schooling. Also, this study exhibited that 27.3% of dairy farmers were illiterate, and 31.3% of dairy farmers were graduated and above.

c. **Annual income:** In this study, the annual income of the dairy farmers ranged from low (below 50000), medium (50000 to 200000), and high (above 200000). It is observed that only 32% of dairy farmers' incomes are high, whereas 46% of dairy incomes are low, and 22% of dairy farmers' incomes are medium.

Table 4: Frequency analysis of the socio-economic factors

		Frequency	Percent	Valid Percent	Cumulative Percent
Age of the dairy farmers	41 to 45	53	35.3	35.3	35.3
	46 to 54	11	7.3	7.3	42.7
	55 and above	86	57.3	57.3	100.0
	Total	150	100.0	100.0	

Education of the dairy farmers	No schooling	41	27.3	27.3	27.3
	Schooling	62	41.3	41.3	68.7
	Graduate and above	47	31.3	31.3	100.0
	Total	150	100.0	100.0	
Annual income of the dairy farmers	Low (below 50000)	69	46.0	46.0	46.0
	Medium (50000 to 200000)	33	22.0	22.0	68.0
	High (Above 200000)	48	32.0	32.0	100.0
	Total	150	100.0	100.0	

4.2. Frequency Analysis of Entrepreneurship:

Entrepreneurial behaviour is positively and considerably associated with factors like innovativeness and information-seeking behaviour of farmers towards dairy farming. Moreover, the knowledge of enhanced dairy management practices is found to have a noteworthy and positive connection with entrepreneurial behaviour. The two constraints associated with the entrepreneurial behaviour of the farmers were measured, and the result is shown in Table 5.

a) **Innovativeness:** The farmers' innovativeness is measured based on the scale in (Vishal et al., 2016). The majority (42.0%) of respondents had a medium level of innovativeness in this study. Moreover, 28.7% and 29.3% of respondents have low and high innovativeness levels, respectively. This could be because inadequate awareness of new technologies and skills, rigid beliefs, poor literacy, and confined habits of the dairy farmers might have prohibited them from being innovative and trying out innovative technologies.

b) **Information-seeking behaviour:** This behaviour is measured in this study based on the experience of the farmers in this field. It is revealed that 22.7% of respondents had low information-seeking behaviour in dairy farming, and 27.3% belonged to a medium level of information-seeking behaviour. Most respondents (50%) had a high level of information-seeking behaviour.

The characteristics of entrepreneurship in the farmers are calculated using the EBI, which uses the mean score values of the attributes (Sharma et al., 2016). It is observed that innovativeness has the highest EBI of 68.88, while the information-seeking behaviour of the respondents has an EBI of 66.845.

Table 5: Entrepreneurship Analysis

		Frequency	Percent	Valid Percent	Mean	Std. Deviation	EBI
Innovativeness (5-25)	**Low (upto 10)**	43	28.7	28.7	17.22	5.92557	68.88
	Medium (11 to 19)	63	42.0	42.0			
	High (above 20)	44	29.3	29.3			
Information-seeking behavior (3-15)	**Low (upto 5 years)**	34	22.7	22.7	10.0267	4.32403	66.845
	Medium (6 to 10 years)	41	27.3	27.3			
	High (above 10 years)	75	50.0	50.0			

4.3. Descriptive Statistics

This section demonstrates the descriptive statistics of the variables exploited in this paper. The summary statistics in Table 5 demonstrate that the primary purpose of understanding those variables is to know the decision-making environment for dairy farm management. For statistics, the average production and marketing value is 1.69%, and the standard deviation is .26787. Moreover, from the table, it is noted that, on average (2.4%), dairy farmers manage the health and feed of animals. Further, the analysis of the variables related to scientific management II exhibits that a low-level value of farm management is predominant in most farmers. In the context of Kurtosis, only 8.69 of dairy farmers concentrate on health and feed management. Also, the standard deviations of the study variables demonstrate that the data for the variables do not vary too far from their means, and the data values vary. Regarding the socioeconomic factors, the Kurtosis and skewness

standard error values were all within ± 1, indicating that they are typically distributed.

Table 5. Descriptive statistics of variables

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Std. Error**	**Statistic**	**Std. Error**
Production and marketing management	150	1.6908	.26787	.072	5.192	.198	44.080	.394
Health and feed management	150	2.4222	.47985	.230	.320	.198	8.691	.394
Scientific management practices I	150	2.0340	.43285	.187	.636	.198	6.550	.394
Scientific management practices II	150	1.7320	.14624	.021	.003	.198	-.325	.394
Socio-economic factors	150	1.7065	.16001	.026	-.152	.198	-.421	.394
Valid N (listwise)	150							

4.4. ANOVA Analysis

The analysis of the production and marketing management impacting the dairy farm of Kollam district in Kerala is summarized in Table 6. From the ANOVA analysis, we can state that the sum of squares (SS) amid the variable is 1.307, and the residual error is 10.92 for product management. By carrying out ANOVA, the degree of freedom (df) and F ratio is represented as F (1, 10) =1.936. Subsequently, the significance level of ANOVA is set as 0.05. The hypothesis gets accepted if the probability value attained is less than the significance level. For the adopted hypothesis (H1), the probability value attained is 0.045, less than the fixed value. Hence, production and marketing management impacts the dairy farm management of Kerala. Concerning health and feed management, the SS among the variables is 4.776, and the residual error among the groups is 34.308. By carrying out the ANOVA, the df and F ratio is F (1, 10) =2.248. Here, in the adopted hypothesis (H2), the probability value attained is 0.038, less than the fixed value. Thus, Health and feed management impact the dairy farm management of Kerala. In Scientific Management Practices I, the SS among the variable is 3.509, and the residual error between groups is 27.917. The df and F ratio is represented as F (1, 10) =1.998. Here, the probability value for hypothesis H3 is 0.018, which is less than the fixed value. Hence, scientific management Practices impact the dairy farm management of Kerala.

Regarding scientific management practices II, the SS among the variable is .202, and the residual error among groups is 3.186. With respect to the df and F ratio, F (1, 10) =0.942. In hypothesis (H4), the probability value attained is 0.497, higher than the fixed value. This signifies that the scientific Management Practice II does not impact the dairy farm management of Kerala.

Table 6: ANOVA analysis of dairy farm management

		Sum of Squares	df	Mean Square	F	Sig.
Production and marketing management	Between Groups	1.307	10	.131	1.936	.045
	Within Groups	9.384	139	.068		
	Total	10.692	149			
Health and feed management	Between Groups	4.776	10	.478	2.248	.018
	Within Groups	29.531	139	.212		
	Total	34.308	149			
Scientific management practices I	Between Groups	3.509	10	.351	1.998	.038
	Within Groups	`24.408	139	.176		
	Total	27.917	149			
Scientific management practices II	Between Groups	.202	10	.020	.942	.497
	Within Groups	2.984	139	.021		
	Total	3.186	149			

5. Conclusion

The dairy business in India plays a vital role in income generation, employment, economic contribution, and export opportunities. In this connection, dairy businesses have more opportunities to start an entrepreneurial activity, enhancing employment and constant income earning in dairying. This paper discusses the farmers' management practices on dairy farms to yield maximum production. The study was carried out in the Kollam district of Kerala. Here, the entrepreneurial behaviour of the dairy farmers was evaluated by their socio-economic factors, such as innovativeness and information-seeking behaviour of the dairy farmers. A total of 150 respondents were selected and distributed with the questionnaire. The analysis was performed using SPSS analysis. The study's findings disclose the impact of the socio-economic factors of the dairy farmers in different management practices, wherein it is seen that the farmers only need a little from most of the scientific management practices. Looking at their entrepreneurial activities, they have a medium level of entrepreneurship. In the future, we can discuss rural entrepreneurs' innovation and knowledge management practices in dairy farm management.

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