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Perceived effectiveness of supply of livestock health supplements by dairy service delivery systems in Namakkal district of Tamil Nadu

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Abstract

The present study was conducted in Namakkal District of Tamil Nadu to explore the perceived effectiveness of supply of livestock health supplements by different dairy service delivery systems. A total of 120 respondents were selected for the study by stratified proportionate random sampling method and the data were collected by personal interview method using pre-tested interview schedule. The respondents predominantly availed the livestock health supplements like mineral mixture from dairy cooperatives (73.33%) followed by pharmacies (57.50%), private veterinarians (26.67%) and public departments (15.83%). Based on the mean weighted score, the dairy farmers perceived the supply of livestock health supplements by the public departments (267.37) in the Namakkal district was effective in terms of their regularity, timeliness, quality, quantity and cost effectiveness followed by pharmacies (262.90), dairy cooperatives (190.90) and private veterinarians (186.25).

Keywords: Dairy, mineral, supplements, pharmacies, cooperatives, veterinarians

Introduction

Livestock health and nutrition constitute foundational elements in dairy systems, directly influencing milk production, reproductive efficiency, and overall farm profitability. Mineral supplementation, in particular, addresses the common deficits in macro- and micro-elements such as calcium, phosphorus, copper, zinc, and cobalt, deficiencies that are routinely documented in farm feedstuffs across India (Bhandari *et al.*, 2016) ^[2]. The deleterious impacts of mineral deficiencies include metabolic disorders like milk fever and downer; reduced immunity; poor fertility; and suboptimal yield necessitates for reliable access to quality health supplements. (Cariappa *et al.*, 2021) ^[3]

In Indian dairy systems, the supply of livestock health supplements is mediated via a pluralistic delivery landscape like cooperatives, public veterinary institutions, private veterinarians, agro-vet pharmacies, educational institutions, private integrators and many others. Each channel has distinct operational features. Dairy cooperatives are embedded in the field and can leverage scale and member networks to disseminate inputs. Public departments, through government veterinary dispensaries and hospitals, often supply subsidized or free supplements as part of extension and animal health policy frameworks. Pharmacies and agro-vet outlets offer immediacy, accessibility, and consistency but often at full commercial cost. Private veterinarians, trusted for their clinical acumen, may supply high-quality products during treatment visits but may lack the logistical capacity for consistent distribution. Educational institutions and integrators, while playing auxiliary roles (e.g. outreach camps, trials), generally have limited outreach.

Dairy sector in Tamil Nadu presents a well-structured cooperative network alongside private players. Studies in dairy value chains have highlighted that input distribution systems critically affect farm efficiency, service equity and adoption of best practices. (Singh *et al.*, 2020) ^[6]. Moreover, recent research on supply chain performance in Indian dairy operations underscores the challenges of logistics, information flow, coordination, and cost constraints in ensuring timely availability of critical inputs (Priya and Vanathi, 2025) ^[4].

Given this context, the present study was conducted in Namakkal district to assess the perceived effectiveness of supplying livestock health supplements like mineral mixture

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through different dairy service delivery systems. By comparing perceptions across different dairy service providers, the research aims to uncover relative strengths and weaknesses in the existing delivery ecosystem and offer evidence-based directions to refine integrated supply models for dairy health inputs.

Materials and Methods

The study was undertaken in Namakkal district of Tamil Nadu state under the Salem District Co-operative Milk Producers Union, which is one of the largest milk procuring union of Tamil Nadu Cooperative Milk Producers Federation. Apart from cooperatives, various private dairies, vendors and cream separation units are also procuring milk from the farmers and offering dairy related services to them. All the four taluks of Namakkal district were purposively included for the study. For each taluk, the revenue villages which are having a female bovine population of above 1000 animals were listed out. From this list, one village from each taluk was randomly selected for the research study. Respondents were selected based on the criteria that the farmers should have milch animal either a cow or a buffalo in milking condition and availing services from different dairy service delivery systems aforementioned. A total of 30 respondents from each village were selected by using stratified proportionate random sampling method. Thus, a total of 120 respondents were selected for the study. The data were collected by personal interview method using a pre-tested interview schedule. The perceived effectiveness

of different dairy service delivery systems for the supply of livestock health supplements was ascertained in terms of their regularity, timeliness, quality, quantity and cost effectiveness. The scores were assigned on a three - point continuum for the indicators in order to analyze their perceived effectiveness. Weighted score for each dairy service delivery system was calculated by assigning 3 for 'good', 2 for 'average' and 1 for 'poor' then multiply the per cent of observation by the respective score and finally adding the total observation.

Results and Discussion

Supply of livestock health supplements by different dairy service delivery systems

Results from the table 1 shows that 73.33% of the dairy farmers received mineral mixture and other animal health supplements from dairy cooperatives and more than half of the respondents (57.50%) received the same from the pharmacies located in the near vicinity. More than one-fourth (26.67%) of the dairy farmers received mineral mixture and other animal health supplements from the private veterinary practitioners in the area who used to give the supplements during the course of treatment of animals. A concise proportion of the dairy farmers (15.83%) availed the mineral mixture and other health supplements from the public departments like state animal husbandry department through the network of their veterinary hospitals, veterinary dispensaries and sub centers.

Table 1: Supply of livestock health supplements by different service delivery systems in Namakkal District

Sl. No	Dairy service delivery systems (N = 120)	Supply of Livestock Health Supplements	
		Frequency*	Per cent
1	Dairy Cooperatives	88	73.33
2	Private Integrators	11	9.17
3	Public Departments	19	15.83
4	Private Veterinarians	32	26.67
5	Para Veterinarians	1	0.83
6	Educational Institutes	5	4.17
7	Pharmacies	69	57.50

* Multiple response

A small portion of the respondents (9.17%) received the supply of mineral mixture and other animal health supplements from their respective dairy integrators. Also a concise percentage of the dairy farmers (4.17%) had availed the supply of mineral mixture and other animal health supplements from educational institutes located in the study area. Veterinary College and Krishi Vigyan Kendra in Namakkal district were supplying mineral mixtures, mineral blocks and other health supplements for the dairy farmers in the Namakkal District by means of organising veterinary health camps and NSS camps. Only a meagre percentage of the dairy farmers (0.83%) received the supply of mineral mixture and other supplements from para veterinarians. Balasaheb (2008) ^[1] also revealed that 60% of the members of the dairy cooperative societies in Maharashtra received the supply of mineral mixture supplements up to medium level from Nashik district cooperative milk union with a

mean percent score of 75.63. Singh (2022) ^[5] also revealed that 26.04% of the general dairy farmers and 73.33% of the commercial dairy farmers in the Punjab procured the mineral mixture supplements for their dairy animals from the nearest retailer / pharmacies.

Perceived effectiveness of supply of livestock health supplements by different dairy service delivery systems

Only four service providers i.e., dairy cooperatives, public departments, private veterinarians and pharmacies who were supplying livestock health supplements to the dairy farmers in the study area were considered for the comparison and the results are presented in Table 2. Since the number of observation for the private integrators, para veterinarians and educational institutes were less; it was not included for analyzing their perceived effectiveness of livestock health supplements.

Table 2: Perceived effectiveness of dairy cooperatives regarding the supply of livestock health supplements

Sl. No.	Indicators	Dairy Cooperatives (n = 88)						Weighted Score
		Good		Average		Poor		
		F	%	F	%	F	%	
1	Regularity	3	3.40	21	23.86	64	72.73	130.65
2	Timeliness	3	3.40	16	18.18	69	78.41	124.97
3	Quality	45	51.14	29	32.95	14	15.91	235.23
4	Quantity	35	39.78	32	36.36	21	23.86	215.92
5	Cost effectiveness	61	69.32	8	9.09	19	21.59	247.73

From the weighted scores presented in the Table 2, it can be concluded that the supply of dairy cooperatives with regard to mineral mixture and other livestock health supplements were perceived as not regular (130.65) and poor in timeliness (124.97) as that of private vets and pharmacies.

But the dairy farmers felt that the supply of supplements were somewhat cost effective (247.73); good quality (235.23). However, the dairy farmers perceived the effectiveness of dairy cooperative to be ambivalent in terms of the quantum supplied.

Table 3: Perceived effectiveness of public departments regarding the supply of livestock health supplements

Sl. No.	Indicators	Public Departments (n = 19)						Weighted Score
		Good		Average		Poor		
		F	%	F	%	F	%	
1	Regularity	13	68.42	2	10.53	4	21.05	247.37
2	Timeliness	15	78.95	0	0.00	4	21.05	257.89
3	Quality	14	73.68	5	26.32	0	0.00	273.68
4	Quantity	14	73.68	3	15.79	2	10.53	263.16
5	Cost effectiveness	18	94.74	1	5.26	0	0.00	294.74

Results in table 3 indicates that the public departments were extremely cost effective (294.74) in supplying the supplements to farmers than other systems because their supply where completely subsidized by the state government which turn given to farmers at free of cost. Also it was perceived by majority of the dairy farmers that their supply was regular (247.37), timely (257.89) and in

sufficient quantity (263.16) next to pharmacies. Similarly Singodia *et al.*, (2020) ^[7] also found that public departments were cost effective in providing the mineral mixture and other supplements to farmers as compared to other systems. However, it was perceived that their supply was available regularly, timely and in required quantity and good quality next to pharmacies.

Table 4: Perceived effectiveness of private veterinarians regarding the supply of livestock health supplements

Sl. No.	Indicators	Private Veterinarians (n = 32)						Weighted Score
		Good		Average		Poor		
		F	%	F	%	F	%	
1	Regularity	0	0.00	7	21.88	25	78.12	121.88
2	Timeliness	0	0.00	10	31.25	22	68.75	131.25
3	Quality	29	90.63	3	9.37	0	0.00	290.63
4	Quantity	6	18.74	13	40.63	13	40.63	178.11
5	Cost effectiveness	10	31.25	15	46.87	7	21.88	209.37

Based on the weighted scores calculated in the table 4, the mineral mixture and other supplements supplied by the practicing private veterinarians were perceived as not at all regular (121.88) and not at all timely (131.25) by the majority of the dairy farmers and also the supplements were not supplied in sufficient quantity (178.11) in cost effective

rate (209.37) to the dairy farmers. However, they have perceived that the quality of livestock health supplements supplied by the private veterinarians were good quality (290.63) which was mainly due to the fact that they were purchased from reputed pharmaceutical companies and sold commercially to the farmers.

Table 5: Perceived effectiveness of pharmacies regarding the supply of livestock health supplements

Sl. No.	Indicators	Pharmacies (n = 69)						Weighted Score
		Good		Average		Poor		
		F	%	F	%	F	%	
1	Regularity	69	100.0	0	0.00	0	0.00	300.00
2	Timeliness	68	98.55	1	1.45	0	0.00	298.55
3	Quality	69	100.0	0	0.00	0	0.00	300.00
4	Quantity	69	100.0	0	0.00	0	0.00	300.00
5	Cost effectiveness	0	0.00	11	15.94	58	84.06	115.94

It can be inferred from the table 5 that majority of the dairy farmers perceived that the supply of pharmacies was effective in terms of regularity (300.00), timeliness

(298.53), quality (300.00), quantity (300.00) than other dairy service providers except their service was considered as not cost effective (116.18). Similarly Singodia *et al.*,

(2020) ^[7] also reported that livestock farmers in Rajasthan perceived that the supply of mineral mixture and other

supplements from pharmacies was efficient as compared to other systems except in terms of cost effectiveness.

Table 6: Overall perceived effectiveness of supply of livestock health supplements by different dairy service delivery systems

Sl. No.	Dairy Service Delivery Systems	Weighted Mean Score	Rank
1	Dairy Cooperatives	190.90	III
2	Public Departments	267.37	I
3	Private Veterinarians	186.25	IV
4	Pharmacies	262.90	II

The weighted mean score for the selected four dairy service delivery systems were calculated using the weighted scores for each indicator regarding the supply of mineral mixture and other livestock health supplements and the results are presented in table 5. Overall it can be concluded that the supply of livestock health supplements by the public departments were perceived as the best (267.37) followed by pharmacies (262.90), dairy cooperatives (190.90) and private veterinarians (186.25). Similar findings were also reported by Singodia *et al.*, (2020) ^[7] who revealed that public departments were effective in providing mineral mixture to the livestock farmers in Jaipur district of Rajasthan.

Conclusion

The present study clearly demonstrated that the supply of livestock health supplements in Namakkal District was supported by a multiplicity of service delivery systems. Though dairy cooperatives and pharmacies serving as the predominant sources; the public departments and private veterinarians also contributed significantly within their respective domains. Smaller contributions from private integrators, educational institutions, and para-veterinarians underline the fragmented but complementary nature of the dairy service supply ecosystem. A comparative assessment of perceived effectiveness revealed that public departments were ranked highest owing to their subsidized supply, coupled with satisfactory regularity, timeliness and quantity of distribution. Pharmacies also offering unmatched consistency, accessibility and product quality, but their effectiveness were constrained by higher prices. Dairy cooperatives though valued for their relative affordability and acceptable quality, inefficiencies in supply regularity and timeliness reduced their credibility. Despite being highly trusted for quality assurance, the private veterinarians were least effective because of their irregular and untimely supply coupled with limited affordability. An integrated and coordinated model that leverages the strengths of each service provider would ensure sustained availability of quality and affordable livestock health supplements. Such an approach is essential for safeguarding animal nutrition, improving herd productivity, and ultimately enhancing the livelihood security of dairy farming households.

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