

SOCIO-ECONOMIC ASPECTS OF NON CONVENTIONAL FEED UTILIZATION AMONG THE DAIRY FARMERS IN VELLORE DISTRICT OF TAMIL NADU

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ABSTRACT

This study is planned to assess the socio-economic profile, cost economics in feeding and impact of brewery waste utilization among dairy farmers in Vellore district of Tamil Nadu. For this purpose, a survey was conducted in six blocks with one village per block and 15 farmers per village constituting a total of 90 respondents. Data was collected through personal interview method with the help of pretested interview schedule. The survey results indicated that majority of the farmers are in the age of 33 - 47 years and the family size of the respondents is less than 5. More than 50% of the farmers had experience of 10 years in dairy farming practices and the annual income from dairy farming was higher than agriculture sector. All farmers were providing their milch animals with green and dry fodder and the total cost incurred varied from Rs.38.97/- to Rs.29.53/day/animal during milch period and from Rs. 31.66/- to Rs.25.38/day/animal during the dry period. In concentrate mixture, the main ingredients reported were bran, husk, rice gruel and oil cakes and total cost incurred varied from Rs.112.74 to Rs.43.04/day/animal during milch period and from Rs.73.25 to Rs.24.95/day/animal during the dry period. The mean milk production varied between 5.37 lts to 9.51 lts/day/animal and the cost/ltr of milk varied between Rs.13.50 to Rs.15.95/ltr. It is imperative to note that 38.89% of the farmers were utilizing unconventional feeds such as tapioca powder, tamarind seed, brewery waste and dried distillers' grain soluble (DDGS) to feed their dairy cattle. Also, from the survey it is inferred that dairy farmers should be sensitised more on the scientific ways of feeding lactating dairy cattle to augment milk production and thereby to increase their livelihood security.

Key words: Dairy farmers, feed cost, milk production, non-conventional feed utilization

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INTRODUCTION

Livestock plays an important role in Indian economy. Indian economy is fastest growing and more than 70 per cent population of India earns from agricultural and animal husbandry sector. Dairying in India occupies a prominent place in rural life and provides not only subsidiary occupation and nutritional standards but is also a source of organic manure and draught power. Livestock sector contributes about 4.11 per cent of the total GDP and 25.6 per cent of the agricultural GDP in the year 2021-22. Milk is an important commodity not only as a source of dairy industrial raw material but also as nutritive food for the people.

Milk has been considered as nearly a complete food for the infants and growing children. India continues to be the largest producer of milk in the world. The Indian dairy sector acquired substantial growth momentum during the last three decades and at present India's total milk production is 210 million tones and per capital availability is 427 gms/ day for the year 2021-22 (Basic Animal Husbandry Statistics, 2021) which is more than the world average of around 321 grams per day reported in 2020 (Food Outlook Nov 2021). This has made the country the highest milk producer in the world and provided milk and milk products for the burgeoning population. At present, Tamil Nadu's milk production is 8.76 million MT and stands eleventh in India (Animal Husbandry Policy Note, 2022).

Hence, an attempt was made to study the socio-economic profile of dairy farmers, to analyse the cost economics in feeding practices and utilization of non conventional feed resources among dairy farmers of Vellore district of Tamil Nadu.

MATERIALS AND METHODS

A survey was conducted to study the socio-economic profile, existing feeding practices and cost economics in lactating dairy cattle in 6 blocks with one village per block and 15 farmers per village in Vellore district of Tamil Nadu. The villages identified for this survey were Kakanampalayam (Thirupathur block), Keelpatti (Gudiyatham block), Pallikuppam (Madhanur block), Kulatheri (Sholinghur block), Bagaveli (Walajah block) and Latteri (Katpadi block). Thus, a total of 90 farmers were selected for the study. Farmers were classified and categorized as landless, marginal (less than 1 hectare), small (1-2 hectare), semi medium (2 – 4 hectare) and medium (4-10 hectares) based on the land holding. The data were collected through personal interview method with the help of pre-structured interview schedule and percentage calculation was carried out.

RESULTS AND DISCUSSION

The socio-economic profile of the surveyed respondents pertaining to age, family size experience in dairy farming and annual income are presented in Table 1. It could be inferred from the table that the average age was higher for medium farmers followed by landless, small, marginal and semi medium

farmers in the descending order. The surveyed results indicated that the majority of the farmers aged between 33 - 47 years (Rajadurai *et al.*, 2018) and those age groups played an important role in income generation for the family (Mahesh *et al.*, 2020). With regard to the family size, it was observed that the majority of the respondents had family size of less than 5 (Gopi *et al.*, 2020). Experience in dairy farming has significant contribution in managing milch animals. Also, it was evident that medium farmers had maximum years and marginal farmers had minimum years as experience in dairy husbandry practices. This could be due to their livelihood which served as a source of income for renewed income generation (Gopi *et al.*, 2020). Among the mean annual income from both enterprises, the data indicated that income from dairy farming was higher than agriculture sector and the income was reported to be higher in medium farmers and lower in landless farmers among farmers classification.

The average fodder and concentrate costs incurred by the dairy farmers (per animal/day) were illustrated in Table 2 and 3. The total cost (Rs/animal/day) incurred by the different class of farmers varied from Rs.38.97 to Rs.29.53, Rs.112.74 to Rs.43.04 and Rs.31.66 to Rs.25.38 and Rs.73.25 to Rs.24.95 for fodder and concentrates during milch and dry period respectively. It was evident that the cost incurred for fodder and concentrates (input cost) during both the periods were higher for medium farmers and low for marginal farmers. Farmers have adopted feeding concentrate quantity based on the milk production of their

individual animals. This was in agreement with the findings of Vijay and Singh (2021). Similar findings were stated by Akila and Senthilvel (2012), that providing concentrates to the dairy animals varies with the milk yield of the animal. However, Yadav *et al.* (2018) studied the economics of buffalo milk production in rural areas of Faizabad district of Eastern Uttar Pradesh and observed that the cost of green, dry fodder is higher for marginal farmers and lower for medium farmers per lactation.

The mean total costs incurred by the dairy farmers during milch and dry period are presented in Table 4. The total cost averaged between Rs.72.51 to Rs.151.71/day/animal and Rs.50.33 to Rs.104.91/day/animal during milch and dry periods respectively. Highly significant difference ($P < 0.01$) was evident between farmers in total cost incurred during milch period, dry period and milk production for their animals, except cost/ litre of milk production where no significant difference was observed. Moreover, the average cost during both the periods was found to be higher for medium farmers and lower for landless farmers, which gives an indication of the influence of the feeding pattern of green fodder, dry fodder and concentrates to milch animals in augmenting milk production. The mean milk production varied between 5.37 lts to 9.51 lts/day/animal and the cost/ltr of milk varied between Rs.13.50 to Rs.15.95/ ltr. Also, it's evident that the mean milk production and cost/litre of milk production were low for landless farmers followed by marginal, small, semi medium and medium farmers in

the increasing order of magnitude. The low cost per litre of milk production by landless farmers could be due to less expenditure on green fodder production, since they don't possess land for green fodder cultivation, dependent on grazing and also the least cost incurred for concentrates. Also, the low milk production by the landless farmers could be attributed to owning of local desi cows. In case of medium farmers, special attention has been given to owning cross bred animals and special emphasis on green fodder cultivation. On the other hand, the cost incurred / litre of milk production followed the same trend which was higher for medium (Rs.15.95) and lower for landless farmers (Rs.13.50). The higher cost for medium farmers could be attributed towards expenditure involved in concentrate and roughage feeding for producing more milk/ kg dry matter intake. This was in agreement with Anbukani (2016), who stated that the total cost of milk production was higher for large herds (Rs.8.43) than small (Rs.7.13) and medium (Rs.6.13) sized herds. Also Yadav *et al.* (2017) stated that the cost of milk production/ animal/ day was higher (Rs.15.51/-) for small farmers (2 milch animals) than marginal farmers (Rs.14.93) possessing one milch animal.

The details of dairy farmers utilizing unconventional feeds for different classification of farmers were presented in Table 5. The results revealed that around 38.89% of the farmers were feeding unconventional feeds to their dairy cattle. The unconventional feeds used were tapioca powder, tamarind

seed, brewery waste and dried distillers' grain soluble (DDGS). Higher percentage of brewery waste and tamarind seed were used by the dairy farmers irrespective of land holding. The utilization of brewery waste by nearly one third of the dairy farmers could be due its low cost and easy availability. Brewer's grains are materials remaining after fermentation of grains during the liquor / beer making process. These materials can be fed in the wet form (wet brewer's grain) or dried form (dried brewer's grain). The nutritional content varies depending on the type of grain used (barley, wheat, corn, sorghum). Dried brewer's grain contains 22-25% protein on dry matter basis. It is a good source of high-quality bypass protein and digestible fibre. It is usually recommended to include dried brewer's grains up to 20-25% of the concentrate mixture and up to 15% of the total dietary dry matter of adult ruminant diet (Gowda *et al.*, 2021). Senthil Murugan *et al.* (2015) conducted an experimental study with wet brewer's grains and stated that at 20% inclusion level, the milk yield increased in lactating dairy cattle. Imaizumi *et al.* (2015) reported that there was an increase in milk yield when wet brewer's grains is used to replace soybean meal for lactating Holstein dairy cows. Anbukani (2016) stated that tamarind seed powder is utilized as one of the energy feed sources among unconventional feeds while studying the economic analysis of dairy farming in dry farming areas of Tamil Nadu. Unconventional feeds shall be used in dry farming areas especially during shortage of feed and fodder to increase milk production.

Table 1. Socio economic profile of dairy farmers (Mean $\pm$ SE)
(*n* – 90)

Farmers land holding	Age (in years)	Family size	Experience in dairy farming (in years)	Annual income (in Rs)	
				Agriculture	Dairy
Landless (13)	42.76 $\pm$ 4.61	4.77 $\pm$ 0.26	11.62 $\pm$ 1.53	-	79153.85
Marginal (42)	39.14 $\pm$ 1.32	4.59 $\pm$ 0.18	9.57 $\pm$ 0.75	60143.81	91928.57
Small (26)	42.11 $\pm$ 1.94	5.07 $\pm$ 0.24	11.73 $\pm$ 0.87	78049.39	96692.31
Semi Medium (6)	33.83 $\pm$ 3.66	4.50 $\pm$ 0.34	12.16 $\pm$ 1.72	89011.42	102333.33
Medium (3)	47.00 $\pm$ 1.01	5.33 $\pm$ 0.33	13.00 $\pm$ 1.02	95032.63	111666.77

Figures within parenthesis indicates number of farmers

Table 2. Cost economics of fodder (Mean $\pm$ SE)

Farmers land holding	Cost during Milch period (Rs/day/animal)			Cost during Dry period (Rs/day/animal)		
	Green fodder	Dry fodder	Total	Green fodder	Dry fodder	Total
Landless	--	29.53 $\pm$ 2.86	29.53 $\pm$ 2.83	--	25.38 $\pm$ 3.73	25.38 $\pm$ 3,72
Marginal	8.48 $\pm$ 1.28	24.57 $\pm$ 2.13	33.05 $\pm$ 1.62	6.55 $\pm$ 0.82	21.00 $\pm$ 2.37	27.55 $\pm$ 1.70
Small	9.31 $\pm$ 0.76	26.07 $\pm$ 2.18	35.38 $\pm$ 1.45	6.73 $\pm$ 0.45	21.46 $\pm$ 2.34	28.19 $\pm$ 1.40
Semi Medium	9.50 $\pm$ 0.98	28.00 $\pm$ 2.04	37.5 $\pm$ 1.53	7.16 $\pm$ 0.40	23.50 $\pm$ 2.16	30.66 $\pm$ 1.30
Medium	13.67 $\pm$ 0.82	25.3 $\pm$ 0.94	38.97 $\pm$ 0.87	9.66 $\pm$ 0.23	22.00 $\pm$ 2.46	31.66 $\pm$ 1.33

Table 3. Cost economics of concentrates (Mean $\pm$ SE)

Farmers land holding	Milch period (Rs/day/animal)					Dry period (Rs/day/animal)				
	Bran	Husk	Rice gruel	Oil cakes	Total	Bran	Husk	Rice gruel	Oil cakes	Total
Landless farmers	19.96 $\pm$ 0.91	15.67 $\pm$ 1.39	1.13 $\pm$ 0.11	6.28 $\pm$ 1.05	43.04 $\pm$ 1.03	9.14 $\pm$ 1.26	8.40 $\pm$ 1.21	1.13 $\pm$ 0.11	6.28 $\pm$ 1.05	24.95 $\pm$ 1.14
Marginal farmers	21.95 $\pm$ 1.06	19.28 $\pm$ 0.92	0.95 $\pm$ 0.11	13.94 $\pm$ 1.68	56.12 $\pm$ 1.08	11.86 $\pm$ 0.87	14.20 $\pm$ 0.82	0.95 $\pm$ 0.11	13.94 $\pm$ 1.68	40.95 $\pm$ 1.18
Small farmers	27.92 $\pm$ 1.65	22.29 $\pm$ 1.55	1.00 $\pm$ 0.15	21.13 $\pm$ 2.09	72.34 $\pm$ 1.14	14.21 $\pm$ 1.15	13.89 $\pm$ 0.88	1.00 $\pm$ 0.15	21.13 $\pm$ 2.09	50.23 $\pm$ 1.78
Semi Medium farmers	28.23 $\pm$ 1.25	27.50 $\pm$ 3.5	1.00 $\pm$ 0.07	22.14 $\pm$ 1.53	78.87 $\pm$ 1.19	15.04 $\pm$ 1.41	15.05 $\pm$ 2.13	1.00 $\pm$ 0.07	22.14 $\pm$ 1.53	53.23 $\pm$ 1.72
Medium farmers	36.67 $\pm$ 5.23	35.00 $\pm$ 4.12	2.67 $\pm$ 0.33	38.4 $\pm$ 5.54	112.74 $\pm$ 3.37	14.67 $\pm$ 3.54	17.50 $\pm$ 3.23	2.68 $\pm$ 0.33	38.4 $\pm$ 5.54	73.25 $\pm$ 3.14

Table 4. Mean total cost incurred during milch, dry period, milk production and cost/litre (Mean $\pm$ SE)

Farmers land holding	Milch period (Rs/day/animal)	Dry period (Rs/day/animal)	Milk production (Litre/day/animal)	Cost/Litre (in Rs)
Landless	72.51 $\pm$ 3.16 ^d	50.33 $\pm$ 3.85 ^d	5.37 $\pm$ 0.05 ^e	13.50 $\pm$ 0.82 ^a
Marginal	89.17 $\pm$ 3.06 ^{cd}	68.50 $\pm$ 2.26 ^c	6.23 $\pm$ 0.10 ^d	14.31 $\pm$ 1.08 ^a
Small	107.72 $\pm$ 4.63 ^{bc}	78.42 $\pm$ 2.93 ^{bc}	7.31 $\pm$ 0.13 ^c	14.74 $\pm$ 1.27 ^a
Semi Medium	116.37 $\pm$ 2.32 ^b	83.89 $\pm$ 1.44 ^b	7.63 $\pm$ 0.07 ^b	15.25 $\pm$ 0.49 ^a
Medium	151.71 $\pm$ 5.32 ^a	104.91 $\pm$ 6.11 ^a	9.51 $\pm$ 0.39 ^a	15.95 $\pm$ 0.76 ^a
F value	17.07 ^{**}	16.06 ^{**}	185.06 ^{**}	1.20 ^{NS}

Means bearing same superscripts within columns do not differ significantly

NS – Non Significant ($P>0.05$) ** - Highly Significant ($P<0.01$)

Table 5. Details of dairy farmers using unconventional feeds

Farmers land holding	Tapioca powder	Tamarind seed	Brewery waste	Dried distillers grain soluble (DDGS)	No. of farmers using unconventional feeds	Total no. of farmers
Landless	2 (15.39)	1 (7.69)	1 (7.69)	1 (7.69)	5 (38.46)	13 (100)
Marginal	3 (7.14)	8 (19.05)	6 (14.29)	1 (2.38)	18 (42.86)	42 (100)
Small	2 (7.69)	2 (7.69)	1 (3.85)	2 (7.69)	7 (26.92)	26 (100)
Semi Medium	1 (16.67)	0 (0)	2 (33.33)	0 (0)	3 (50.00)	6 (100)
Medium	1 (33.33)	0 (0)	1 (33.34)	0 (0)	2 (66.67)	3 (100)
Overall	9 (10.00)	11 (12.22)	11 (12.22)	4 (4.45)	35 (38.89)	90 (100)

(Figures within parenthesis indicate percentage).

CONCLUSION

Hence, it can be concluded from the study that majority of the farmers involved in dairy farming activity were aged 33 - 47 years with the family size being less than five. Also, more than 50% of the farmers had more than 10 years of experience in dairy farming which plays an important role in managing milch animals. Concentrates provided to the animals plays an important role in boosting milk production and farmers have adopted feeding concentrates quantity based on milk production of their individual animals. Non-conventional feed resources such as brewery waste, tamarind seed cake, tapioca powder were utilized by dairy farmers to reduce the

cost of milk production. Also, farmers should have to be sensitized thoroughly on knowledge about the scientific ways of feeding lactating dairy cattle in augmenting milk production and increasing their livelihood security.

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