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Influence of farm location on dairy farm feeding welfare scores in Karnataka

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Abstract

This study was undertaken to compare the status of cattle welfare in dairy farms of different regions in Karnataka, India. A total of 401 adult crossbred cattle in 60 dairy cattle farms, 30 from the peri-urban region of Bengaluru Rural district and 30 from rural region of Kolar district of Karnataka were considered for the present study. The mean scores of the welfare indicator 'Availability of quality feeds and fodder' in peri-urban and rural regions, out of total score of 10, was 5.93 ± 0.057 and 5.93 ± 0.086 , respectively. Peri-urban regions had better welfare scores for the indicator 'Feeding practices for different categories of animals' with 5.17 ± 0.108 out of 10, as compared to 4.72 ± 0.092 in rural regions. The mean scores of the welfare indicator 'Availability of feeds and fodder storage/preservation space' in peri-urban and rural regions, out of total score of 5, was 3.28 ± 0.101 and 3.33 ± 0.091 , respectively. The mean scores of the welfare indicator 'Colostrum and milk feeding to calves' in peri-urban and rural regions, out of total score of 5, was 4.65 ± 0.059 and 4.68 ± 0.045 , respectively; with no significant differences between groups. The overall mean welfare score of feeding component in peri-urban and rural dairy farms, out of total score of 30, was 19.03 ± 0.182 and 18.67 ± 0.670 , respectively, with no significant differences.

Keywords: Dairy cattle welfare, feeding, rural, peri-urban, Karnataka

Introduction

Karnataka holds the eleventh position among Indian states in terms of total milk production, contributing approximately 11 million metric tonnes annually (BAHS, 2019) ^[1]. The livestock industry is increasingly recognized as a vital contributor to the growth of the agricultural sector. As outlined by the Farm Animal Welfare Council (FAWC, 1993) ^[3], ensuring animal welfare involves providing freedom from hunger, thirst, and malnutrition, which includes consistent access to clean water and a nutritionally adequate diet to support optimal health and vitality. Animal welfare encompasses the well-being of animals across all species. In the early stages, human attention was primarily focused on the welfare of domesticated animals. However, with time, concern for animal welfare has expanded globally, reflecting a growing awareness of the issue. The pressure to meet human demands has led to stressful production systems that negatively affect animal welfare. As a result, the lifespan of cattle has significantly decreased due to prolonged suffering. Ultimately, ensuring proper animal welfare can lead to greater economic benefits for those involved in animal care and management. As a developing nation, India faces the challenge of balancing the interests of livestock owners with the well-being of the animals they raise.

There are very few studies which have attempted to document the status of dairy cattle welfare in Karnataka. Increased awareness regarding various aspects of animal

welfare among the consumers has led to greater demand for livestock products from high welfare farms, which can result in higher sale prices and profits. Therefore, this study aims to assess the welfare status of dairy farms based on their proximity to urban areas, and identify the factors associated with better animal welfare.

Materials and Methods

In India, Karnataka state stands sixth among the largest states in terms of geographical area. It lies on the western part of the Deccan plateau. Karnataka is one of the country's leading agricultural states, with a relatively high density of livestock population and livestock rearing is regarded as an important part of the rural economy. Bengaluru Rural and Kolar districts were purposively selected to represent peri-urban and rural regions of Karnataka, respectively. Both districts Bengaluru Rural (3,24,583) and Kolar (2,09,642) have a large population of crossbred cattle and are the leading milk producers in the state. Bengaluru Rural and Kolar are in the eastern dry agro-climatic zone in South Karnataka. The purposive random sampling method was used for the selection of livestock farms households.

The resource/environment-based indicators of animal welfare were assessed at 60 dairy farms, 30 from the peri-urban region of Bengaluru Rural district and 30 from rural region of Kolar district were considered for the present study, comprising 401 adult crossbred dairy cows in which the animal-based indicators were evaluated. Relevant

variables to study the management practices related to the welfare status of dairy cattle and attitude of farmers to dairy cattle welfare formed the basis for developing the schedule of enquiry, and to assess the dairy cattle welfare. Assessment of the welfare status of dairy cattle was done by using the basic components of the welfare scale were developed by Calamari and Bertoni (2009) [3] based on Integrated Diagnostic System Welfare (IDSW), and the Dairy Cattle Welfare Scale developed by Kumar (2016) [5], with suitable modifications keeping in view the farming practices and local conditions of the study area.

The welfare score of the component “Feeds and Feeding practices” with a total score of 30, comprised: Availability of feeds and fodder (10), Feeding practices for different categories of animals (10), Availability of feeds and fodder storage/preservation space (5), and Colostrum and milk feeding (5).

Results and Discussion

The overall mean scores of the welfare indicator ‘Feed and feeding practices’ in dairy farms of different regions is presented in Table 1, with detailed breakup in Table 2. The mean welfare score in peri-urban and rural regions, out of total score of 30, was 19.03 ± 0.182 and 18.67 ± 0.211 , respectively. No significant difference was observed in dairy farms of different regions, possibly due to similar availability of feeds and fodder, fodder storage and colostrum feeding; while peri-urban farms had better feeding practices as compared to rural farms. In contrast, Kumar (2016) [4] found significantly better welfare in peri-urban dairy farms.

Availability of quality feed and fodder

The mean score in peri-urban and rural regions, out of total score of 10, was 5.93 ± 0.057 and 5.93 ± 0.086 , respectively. No significant difference was observed among dairy farms in different regions, possibly due to similar

feeding pattern. However, peri-urban farms used greater quantity of feed supplements as compared to rural farms. In contrast, Kumar (2016) [4] reported significantly better welfare scores in peri-urban dairy farms.

Feeding practices for different categories of animals

The mean score in peri-urban and rural regions, out of total score of 10, was 5.17 ± 0.108 and 4.72 ± 0.092 , respectively, with significantly ($P < 0.05$) higher scores in peri-urban dairy farms. None of the farmers practices fodder enrichment, TMR or use of UMMB/salt licks. Better welfare scores were primarily due to chaffing of fodder, steaming up and summer feeding schedule. In contrast, no significant differences among farms of different regions was reported by Kumar (2016) [4].

Availability of feeds and fodder storage/preservation space

The mean welfare score in peri-urban and rural regions, out of total score of 5, was 3.28 ± 0.101 and 3.33 ± 0.091 , respectively. No significant differences were observed among the different regions of the dairy farms, due to similar feeding management practices. However, rural farms had more dry fodder and concentrate feed storage space and better feed storage area hygiene as compared to peri-urban farms, which had better facilities for mixing feed ingredients. Similar findings were reported by Kumar (2016) [4].

Colostrum and milk feeding to calves: The mean welfare score in peri-urban and rural regions, out of total score of 5, was 4.65 ± 0.059 and 4.68 ± 0.045 , respectively, with no significant differences observed. However, rural dairy farmers fed colostrum to calves earlier than peri-urban dairy farmers, whereas peri-urban farmers fed colostrum more frequently. Similar findings were reported by Kumar (2016) [4].

Table 1: Mean welfare score of ‘feeds and feeding practices’ component in peri-urban and rural dairy farms

Welfare indicator	Max Score	Region		Overall	P-value
		Peri-urban	Rural		
Availability of feeds and fodder	10	5.93 ± 0.057	5.93 ± 0.086	5.93 ± 0.051	1.000
Feeding practices for different categories of animals	10	$5.17^a \pm 0.108$	$4.72^b \pm 0.092$	4.94 ± 0.076	0.002
Availability of feeds and fodder storage/ preservation space	5	3.28 ± 0.101	3.33 ± 0.091	3.31 ± 0.067	0.714
Colostrum and milk feeding	5	4.65 ± 0.059	4.68 ± 0.045	4.67 ± 0.037	0.656
Total score	30	19.03 ± 0.182	18.67 ± 0.211	18.85 ± 0.140	0.194

Table 2: Mean welfare score of sub-components of ‘feeds and feeding practices’ in dairy farms of different regions

Sl. No.	Welfare indicator	Max Score	Region		Overall
			Peri-urban	Rural	
1	Availability of feeds and fodder	10	5.93 ± 0.057	5.93 ± 0.086	5.93 ± 0.051
	Green fodder quality	1	0.92 ± 0.035	0.93 ± 0.032	0.93 ± 0.023
	Green fodder quantity	1	0.50 ± 0.000	0.50 ± 0.000	0.50 ± 0.000
	Dry fodder quality	1	0.95 ± 0.028	0.95 ± 0.028	0.95 ± 0.020
	Dry fodder quantity	1	0.50 ± 0.000	0.52 ± 0.017	0.51 ± 0.008
	Silage quality	1	0.02 ± 0.017	0.02 ± 0.017	0.02 ± 0.012
	Silage quantity	1	0.02 ± 0.017	0.05 ± 0.037	0.03 ± 0.02
	Concentrate feed quality	1	1.00 ± 0.000	0.98 ± 0.017	0.99 ± 0.008
	Concentrate feed quantity	1	0.52 ± 0.017	0.50 ± 0.000	0.51 ± 0.008
	Feed supplements quality	1	0.98 ± 0.017	1.00 ± 0.000	0.99 ± 0.008
	Feed supplements quantity	1	0.53 ± 0.023	0.48 ± 0.029	0.51 ± 0.019
2	Feeding practices	10	5.17 ± 0.108	4.72 ± 0.092	4.94 ± 0.076

	Grazing practiced	1	0.12 ± 0.039	0.15 ± 0.043	0.13 ± 0.029
	Chaff cutting of roughages	1	0.60 ± 0.084	0.32 ± 0.074	0.46 ± 0.059
	Fodder enrichment	1	0 ± 0	0 ± 0	0 ± 0
	Use of TMR	1	0 ± 0	0 ± 0	0 ± 0
	Steaming up	1	1.00 ± 0.000	0.97 ± 0.033	0.98 ± 0.017
	Special feeding after calving	1	1.00 ± 0.000	1.00 ± 0.000	1.00 ± 0.000
	Summer feeding schedule	1	0.48 ± 0.056	0.28 ± 0.052	0.38 ± 0.04
	Concentrate feeding as per MY	1	0.97 ± 0.023	1.00 ± 0.000	0.98 ± 0.012
	Concentrate feeding frequency	1	1.00 ± 0.000	1.00 ± 0.000	1.00 ± 0.000
	Use of UMMB/salt licks	1	0 ± 0	0 ± 0	0 ± 0
3	Availability of storage/preservation space	5	3.28 ± 0.101	3.33 ± 0.091	3.31 ± 0.067
	Dry fodder storage space	1	0.88 ± 0.039	0.95 ± 0.028	0.92 ± 0.024
	Silage storage space	1	0.02 ± 0.017	0.02 ± 0.017	0.02 ± 0.012
	Concentrate feed storage space	1	0.87 ± 0.041	0.92 ± 0.035	0.89 ± 0.027
	Facility for mixing ingredients	1	0.60 ± 0.037	0.52 ± 0.056	0.56 ± 0.034
	Hygiene of feed storage area	1	0.92 ± 0.035	0.93 ± 0.032	0.93 ± 0.023
4	Colostrum and milk feeding	5	4.65 ± 0.059	4.68 ± 0.045	4.67 ± 0.037
	Colostrum feeding	2	2.00 ± 0.000	2.00 ± 0.000	2.00 ± 0.000
	Time of colostrum feeding	1	0.90 ± 0.044	0.97 ± 0.023	0.93 ± 0.025
	Colostrum feeding frequency	1	0.75 ± 0.046	0.72 ± 0.046	0.73 ± 0.032
	Milk feeding as per body weight	1	1.00 ± 0.000	1.00 ± 0.000	1.00 ± 0.000
	Total score	30	19.03 ± 0.182	18.67 ± 0.211	18.85 ± 0.14

Conclusion

No significant differences were noticed in the welfare scores of availability of quality feed and fodder, availability of feeds and fodder storage and colostrum & milk feeding to calves in peri-urban rural dairy farms due to similar feeding practices, feeding management practices and colostrum and milk feeding practices. Significantly better welfare score was obtained in terms of feeding practices for different categories of animals in peri-urban areas as compared to rural areas, primarily due to chaffing of fodder, steaming up and summer feeding schedule. The results suggest that there is substantial scope for improvement of feeding welfare in dairy cattle.

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