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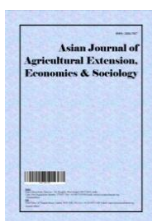
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Participation of Farm Women in Dairy Management Practices in Krishna District of Andhra Pradesh in India

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Authors' contributions

This work was carried out in collaboration among all authors. Author NLK designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AA and SJR managed the analyses of the study. Author MM managed the literary searches. All authors read and approved the final manuscript.

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ABSTRACT

An investigation was conducted to study the participation of farm women in dairy management practices in Krishna district of Andhra Pradesh .A total of 225 farm women were selected based on their land holding capacity. The study revealed that women from small farmer category had more participation in taking animals for pregnancy diagnosis (81.33%) and post calving care (77.33%).Women under landless category were more involved in regularly taking animals for grazing (45.33%), green fodder collection and feeding (68%) and feeding animals with concentrates (88%).Feeding of animals with dry fodder regularly was more in small women dairy farmer category (89.33%) and landless (86.66%) than that in medium (56%) farm women category. Cleaning of animal sheds regularly was high in landless (76%) and small (69.33%) farm women

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than in medium (44%) farm women. Majority of women under landless category were regularly using disinfectants for cleaning of animal sheds (49.33%). Regular involvement in disposing of dung and composting of dung is high in women under landless (69.33%) and small (65.33%) farm women categories. Feeding of Colostrum to the calves regularly is high in small (86.66%) farmwomen category and cleaning of calf after birth is high in landless (84%) women category. Women in landless (77.33%) and small (74.6%) farmer categories are regularly washing the animals before milking. It was observed that 12% of women under medium farmer category and 8% under small farmer category are engaging labour for milking of animals. Women under small (76%) and landless (73.33%) farmer category were regularly taking care of sick animals. Sale of milk regularly through cooperatives was observed to be high in landless (85.33%) and small (90.66%) farm women categories. More number of women under landless (21.33%) were regularly participating in insurance of animals than small (6.66%) and medium (10.66%) farm women categories. More number of medium (9.33%) women dairy farmers were regularly involved in purchase of animals compared to landless (5.33%) and small (1.33%) farm women.

Keywords: Farm women; participation; dairy; feeding; cleaning.

1. INTRODUCTION

Rural Women form the most important productive work force in the economy of majority of the developing nations including India. In India, about 88 per cent of rural women engage in agriculture and allied activities. Women play significant and crucial role in agricultural development and allied fields like dairy farming, vermicompost production etc [1]. Dairy in India plays a crucial role in the rural economy that has the highest potential of generating income and employment through augmenting productivity of milch animals [2]. Despite the fact women in India do most of the work in animal husbandry yet their contribution has largely been ignored and inadequately acknowledged. They always remain invisible workers. Hence there is a need to document their contribution to dairy farming. The present study was conducted to study the participation of farm women in dairy management practices in Krishna district of Andhra Pradesh.

2. MATERIALS AND METHODS

A total of 225 farm women were selected for the study (3 mandals from each of the 5 animal husbandry divisions, 5 villages from each mandal and 3 women dairy farmers from each village) based on their land holding capacity (landless-0 acres, small farmer- up to 5 acres, medium farmer - 5-10 acres). The data were collected by administering the interview schedule and analyzed by statistical methods according to Snedecor and Cochran [3]. The information obtained was analysed and interpreted.

3. RESULTS AND DISCUSSION

3.1 Participation of Dairy Farm Women in Breeding Management Practices

On perusal of Table 1 it was observed that majority (81.33%) of the dairy women under small farmer category were regularly taking animals for pregnancy diagnosis followed by landless (46.66%) and medium farm women (20%) category. Overall, significantly ($P \leq 0.01$) majority (49.33%) of the women dairy farmers were taking animals for pregnancy diagnosis in the study area. It was lower than the value reported by [4] where 90.83% of the farm women were actively involved in taking animals for pregnancy diagnosis. It was observed that 6.66% of women under landless category were regularly calling veterinarian during dystocia, 2.66% under small and 1.33% under medium farm women category. It was reported that only 3.55% of the farm women in the study area are regularly calling veterinarian during dystocia. It was against to the findings of [4] who reported that 73.33% of the respondents called veterinarian during dystocia. It was observed that 77.33% of the women dairy farmers were regularly involved in post calving care under small farmer category, 69.33% under landless and only 5.66% under medium farm women category. Overall, significantly ($P \leq 0.01$) more number (65.77%) of women dairy farmers were regularly involved in post calving care in the study area.

3.2 Participation of Dairy Farm Women in Feeding Management Practices

It was observed from Table 2 that 45.33% of the women dairy farmers were regularly taking

animals for grazing under landless category, 36% under small and 24% under medium farm women category. It was observed 35.11% were regularly taking animals for grazing and 15.11% were occasionally taking animals for grazing in the study area. [4-6] that majority of the farm women were taking animals for grazing, whereas [7] reported only 10.1% were involved in grazing of animals. It was observed that 68% of the women dairy farmers were regularly involved in green fodder collection and feeding under landless category, 42.66% under medium and 38.66% under small farm women categories. Overall, significantly ($P \leq 0.01$) more number (59.11%) of the women dairy farmers were regularly involved in green fodder collection and feeding. [4] reported that 80.83% of women involved in fodder collection, whereas [7] and [8] reported only 11.4 and 34.6 per cent of farm women were involved in collection of green fodder, respectively.

It was observed that only 12% of farm women were regularly chaffing the fodder. Adoption of this practice is very poor in all the categories of farm women. It was contrast to the finding of [4] who reported that 75% of women were performing chaffing of fodder and [8] who reported 37.3% were involved in chaffing of fodder. The lower rate of adoption of chaffing of green fodder in the study area might be due to lack of awareness about the importance of chaffing and adequate financial support for purchase of chaff cutter. It was observed that feeding animals with dry fodder (paddy straw) was more in small women dairy farmer category (89.33%) and landless (86.66%) than that in medium (56%) farm women category. Overall, significantly ($P \leq 0.01$) more number (72.44%) of women dairy farmers were regularly feeding animals with dry fodder. Further it was found that paddy straw was major source of dry fodder for feeding of dairy animals as paddy is the main food crop in the study area.

It was observed that 88% of the women dairy farmers were regularly feeding animals with concentrates under landless, 76% under small and 58.66% under medium farm women categories. Overall, significantly ($P \leq 0.01$) more number (74.22%) of the women dairy farmers were regularly feeding animals with concentrates. It was similar to the findings of Bhanotra et al. (2015) who reported that 79% of respondents were offering concentrate mixture to the animals. The study revealed that the farmers

were aware of the importance of feeding concentrate mixture to dairy animals. It was observed that storage of feed and fodder was high in landless women dairy farmer category (70.66%) and small (68%) than that in medium farm women (53.33%) category. Overall, significantly ($P \leq 0.01$) more number (64%) of the women dairy farmers were regularly involved in storage of feed and fodder. It was similar to the findings of [4] who reported that 77.5% were involved in storage of feed and fodder.

3.3 Participation of Dairy Farm Women in Housing Management Practices

It was observed from the Table 3 that significantly ($P \leq 0.01$) more number (63.55%) of the women dairy farmers were regularly cleaning the animal sheds. It was observed to be high in landless (76%) and small (69.33%) farm women category than in medium (44%) farm women category. The results were similar with the findings of [9], [5] and [4] who reported nearly 80% of farm women were involved in cleaning of animal sheds. It was observed that 49.33% of the women dairy farmers were regularly using disinfectants for cleaning of animal sheds under landless category, 46.66% under small and 32% under medium farm women category. Overall, 40.44% of the women dairy farmers were regularly using disinfectants for cleaning of animal sheds.

It was observed that regular involvement in disposing of dung is high in landless (69.33%) and small (65.33%) farm women categories than in medium (40%) farm women category. Overall, significantly ($P \leq 0.01$) more number (58.22%) of the women dairy farmers were regularly involved in disposal of dung. Where as [4] and [8] reported that around 90% of farm women were involved in disposal of dung. The results revealed that significantly ($P \leq 0.01$) more number (58.22%) of the women dairy farmers were regularly participating in composting of dung. It was observed to be high in landless (69.33%) and small (65.33%) farm women categories than in medium (40%) farm women category. Whereas [9] reported that only 25% of farm women regularly participated in the preparation of farm yard manure or compost manure. It was also observed that 8% and 5.33% dairy farm women were regularly preparing gobar gas under landless and medium farm women categories, respectively. Overall, only 4.44% of farm women were regularly preparing gobar gas. The result was similar with findings of [9] who

reported that 5% of the farm women participated in preparing gobar gas mixture. This may be attributed to the lack of awareness regarding the technology to the women farmers.

3.4 Participation of Dairy Farm Women in Milking Management Practices

On perusal of Table 4 revealed that regular washing of the animals before milking is high in landless (77.33%) and small (74.6%) farm women categories than in medium (46.66%) farm women category. Overall, significantly ($P \leq 0.01$) more number (66.66%) of the women dairy farmers were regularly washing the animals before milking. The result was similar with the findings of [4] who reported that 70.83% of farm women were involved in washing of animals in Bagalkot district of Karnataka. It was also observed that 90.66%, 98.66% and 92% of dairy farm women were regularly milking the animals under landless, small and medium farm women categories, respectively. Overall, 93.77% of the women dairy farmers were regularly milking the animals. The result was similar with the findings of [4,6,10] who also reported that majority of the farm women were involved in milking the animals. It was observed that 12% and 8% of the women dairy farmers were regularly using labour for milking of their animals under medium and small farm women categories, respectively. Overall, only 6.66% of farm women were regularly using labour for milking of animals.

It was observed that 96%, 97.33% and 86.66% of the women dairy farmers were regularly cleaning milking utensils under landless, small and medium farm women categories, respectively. Overall, significantly ($P \leq 0.01$) majority (93.77%) of women dairy farmers were regularly cleaning the milking utensils. The result was in agreement with the findings of [6] and [10] who reported that around 98% of farm women were involved in cleaning of milking utensils. It was observed that 5.33% of women under medium farm women category were regularly practicing teat dipping in Povodine Iodine (PI) after milking. Only 2.22% of farm women were regularly practicing teat dipping in PI after milking in the study area. It was observed that 97.33% of women dairy farmers were regularly boiling the milk under landless and small farm women categories and 94.66% under medium farm women category. Overall, significantly ($P \leq 0.01$) majority (96.44%) of the women

dairy farmers were regularly boiling the milk in the study area. It was observed that 5.33%, 10.66% and 9.33% of farm women were regularly maintaining milk records. Overall, only 8.44% were regularly maintaining milk records. The result was in contrast to the findings of [4] who reported that 52.5% were maintaining dairy records.

3.5 Participation of Dairy Farm Women in Health Care Management Practices

It was observed from Table 5 that significantly ($P \leq 0.01$) more number (65.33%) of women dairy farmers were taking care of the sick animals regularly in the study area. It was observed to be high in landless (73.33%) and small (76%) farm women categories than in medium (46.66%) farm women category. Similarly Rathod *et al.* (2011) reported that 86.66% were involved in the care of sick animals and Bhanotraet *et al.* (2015) reported that 95% of women were involved in taking care of sick animals which are higher than the values reported in the present study. It was observed that 34.66%, 36% and 17.33% of the women dairy farmers under landless, small and medium category were regularly taking the animals for treatment. Overall, only 29.33% were regularly taking animals for treatment. Whereas [9,4,6,8] reported that majority of women were involved in taking animals for treatment.

It was observed that 16% of women under landless category and 8% under small and medium farm women categories were taking their animals for vaccination and medication. Overall, only 10.66% of women dairy farmers were regularly taking animals for vaccination and medication. In contrast [4] and [6] reported that around 80% of the farm women were involved in vaccination and medication of animals, whereas [8] reported that 30.6% of women were involved. It was observed only 9.77% of farm women were regularly deworming adult animals in the study area. It indicated that the adult dairy animals were dewormed as and when required but not as preventive measure. The result was in contrast to the findings of [8] who reported that 55.3% farm women were involved in deworming of animals. It was observed that only 6.66% of farm women were regularly purchasing veterinary medicine in the study area. Similar trend was noticed among all the categories of women dairy farmers.

Table 1. Participation of women dairy farmers in breeding management practices

S. no	Category		Landless (N =75)%	Small (N =75)%	Medium (N =75)%	Overall (N =225)%	χ ² value
1	Taking animals for pregnancy diagnosis	Regularly	46.66	81.33	20.00	49.33	43.44**
		Occasionally	21.33	6.66	5.33	11.11	
		Never	32.00	12.00	74.66	39.55	
2	Calling veterinarian during dystocia	Regularly	6.66	2.66	1.33	3.55	243.28**
		Occasionally	4.00	2.66	2.66	3.11	
		Never	85.33	94.66	96.00	93.33	
3	Post calving care	Regularly	69.33	77.33	50.66	65.77	74.09**
		Occasionally	14.66	13.33	16.00	14.66	
		Never	16.00	9.33	33.33	19.55	

N= No. of women dairy farmer; ** Significant at (P≤0.01)

Table 2. Participation of women dairy farmers in feeding management practices

S. no.	Category		Landless (N =75)%	Small (N =75)%	Medium (N =75)%	Overall (N =225)%	χ ² value
1	Taking animals for grazing	Regularly	45.33	36.00	24.00	35.11	29.68**
		Occasionally	14.66	24.00	6.66	15.11	
		Never	40.00	40.00	69.33	49.77	
2	Green fodder collection and feeding	Regularly	68.00	38.66	42.66	59.11	55.64**
		Occasionally	9.33	16.00	12.00	12.44	
		Never	22.66	17.33	45.33	28.44	
3	Chaffing of fodder	Regularly	14.66	16.00	5.33	12.00	187.74**
		Occasionally	0	2.66	5.33	2.66	
		Never	85.33	81.33	89.33	85.33	
4	Feeding the animals with concentrates	Regularly	88.00	76.00	58.66	74.22	130.83**

N= No. of women dairy farmer; ** Significant at (P≤0.01)

Table 3. Participation of women dairy farmers in housing management practices

S. no	Category		Landless (N =75)%	Small (N =75)%	Medium (N =75)%	Overall (N =225)%	χ ² value
1	Cleaning of animal sheds	Regularly	76.00	69.33	44.00	63.55	63.8**
		Occasionally	18.66	18.66	18.66	18.66	
		Never	4.00	12.00	37.33	17.77	
2	Use of disinfectants for cleaning of shed	Regularly	49.33	46.66	32.00	40.44	29.16**
		Occasionally	22.66	10.66	10.66	14.66	
		Never	34.66	42.66	57.33	44.88	
3	Disposal of dung	Regularly	69.33	65.33	40.00	58.22	46.97**
		Occasionally	20.00	18.66	9.33	16.00	
		Never	10.66	16.00	50.66	25.77	

N= No. of women dairy farmer, ** Significant at (P≤0.01)

Table 4. Participation of women dairy farmers in milking management practices

S. no.	Category		Landless (N =75)%	Small (N =75)%	Medium (N =75)%	Overall (N =225)%	χ ² value
1	Washing of animals before milking	Regularly	77.33	74.66	46.66	66.66	77.21**
		Occasionally	20.00	13.33	16.00	16.00	
		Never	2.66	12.00	37.33	17.33	
2	Milking of animals by farm women	Regularly	90.66	98.66	92	93.77	247.03**
		Occasionally	2.66	0	8.00	4.00	
		Never	6.66	1.33	0	2.22	
3	Maintaining of milk records	Regularly	5.33	10.66	9.33	8.44	226.1**
		Occasionally	1.33	0	0	0.44	
		Never	93.33	89.33	90.66	91.11	

N= No. of women dairy farmer; ** Significant at (P≤0.01)

Table 5. Participation of women dairy farmers in health care management practices

S. no.	Category		Landless (N =75)%	Small (N =75)%	Medium (N =75)%	Over all (N =225)%	χ ² value
1	Care of sick animals	Regularly	73.33	76	46.66	65.33	71.29**
		Occasionally	16.00	10.66	26.66	17.77	
		Never	10.66	13.33	26.66	16.88	
2	Vaccination and medication	Regularly	16.00	8.00	8.00	10.66	192.52**
		Occasionally	5.33	2.66	1.33	3.11	
		Never	78.66	89.33	90.66	86.22	
3	Deworming of adult animals	Regularly	13.33	10.66	5.33	9.77	198.24**
		Occasionally	5.33	2.66	1.33	3.11	
		Never	81.33	86.66	93.33	87.11	

N= No. of women dairy farmer; ** Significant at (P≤0.01)

3.6 Participation of Women Dairy Farmers in Marketing of Milk

It was observed that 29.33%, 32% and 12% of the women dairy farmers under landless, small and medium farm women category were regularly participating in household sale of milk and milk products. Overall, 25.77% of farm women were regularly participating and 7.11% were occasionally participating in household sale of milk and milk products. The result was similar with the findings of [9] who reported that 66.66% of farm women did not participate in household sale of milk.

It was observed that significantly ($P \leq 0.01$) more number (78.66%) of women dairy farmer were regularly selling milk through cooperatives in the study area. It was observed to be high in landless (85.33%) and small (90.66%) farm women categories than in medium (56%) farm women category. The result was similar with the findings of [9] who reported that 90% of the farm women participated in sale of milk through cooperatives.

It was observed that 70.66% under landless and 73.33% of the women dairy farmers under small and medium farmer categories were regularly preparing the milk products. Overall, significantly ($P \leq 0.01$) majority (72.44%) of women dairy farmers were regularly preparing the milk products. It was similar to the findings of [4] who reported that 68.33% of farm women performed milk processing activities. Regular involvement of women dairy farmers in money collection was observed to be high in landless (38.66%) and small (40%) farm women categories than in medium (21.33%) farmers. Overall, 33.33% were regularly collecting the money.

3.7 Participation of Dairy Farm Women in Economic Activities of Dairy Farm

It was observed that 21.33%, 6.66% and 10.66% of farm women were regularly participating in insurance of animals under landless, small and medium farm women categories. Overall, only 12.88% farm women were regularly participating in insurance of animals in the study area. The result was in contrast to the findings of [6] who reported that 82.50% of respondents were involved in insurance of animals in Anand district of Gujarat. It was observed that 9.77% of women were regularly taking loans/credits and 32.11% were occasionally taking loans from banks/cooperatives in the study area. The result was similar with the findings of [4] who reported

that 49.16% of women were involved in taking loans/credits from banks. It was observed that 14.66%, 12% and 8% of farm women were regularly purchasing concentrate feed under landless, small and medium farm women categories, respectively. Overall, 11.55% of farm women were regularly purchasing concentrate feed in the study area. The result was opposite to the findings of [6] who reported that 94.17% of farm women were involved in purchase of food.

It was observed that 9.33% of farm women under landless and small farm women categories, 12% under medium farm women category are regularly involved in sale of animals. Overall, only 10.22% were regularly involved in sale of animals in the study area. The result was opposite to the findings of [4,6] who reported that majority of the farm women were involved in sale of animals. It was observed that more number of medium (9.33%) women dairy farmers were regularly involved in purchase of animals compared to landless (5.33%) and small (1.33%) farm women. Overall, only 5.33% were regularly involved in purchase of animals in the study area. The result was against to the findings of [4,6] who reported that majority of farm women were involved in purchase of animals. The feed back of the Veterinarians in the study area showed that the participation of farm women was more in breeding, feeding, milking and health care management of dairy animals compared to the marketing of milk and economic activities of dairy farm.

4. CONCLUSION

Awareness should be created regarding the importance of seeking the help of veterinarian during dystocia, chaffing of fodder, maintaining of milk records, vaccination and deworming of animals. Farm women also need to be trained on the preparation of milk products and importance of insurance of animals.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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