



ADOPTION BEHAVIOUR OF DAIRY FARMERS ABOUT RECOMMENDED DAIRY MANAGEMENT PRACTICES

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Abstract

The present study was conducted in Ratnagiri, Sindhudurg, Raigad and Thane districts of Konkan region of Maharashtra state, with the objectives of profile characteristics of the dairy farmers, adoption behaviour of dairy farmers about recommended dairy management practices, relationship between personal, socio-economic and psychological characteristics of dairy farmers with adoption behaviour of recommended dairy management practices, document the existing dairy management practices followed by dairy farmers, assess the training needs of the dairy farmers and suggest the strategies to improve milk production in Konkan region. Overall adoption behaviour of dairy farmers towards recommended dairy management practices was found 'medium' (71.50 per cent), while nearly equal number, *i.e.* 17.00 per cent and 11.50 per cent of the dairy farmers were in 'low' and 'high' of adoption behaviour, respectively. The personal, socio-economic and psychological characteristics of the respondents namely, annual income, number of milch animals, milk production, availability of water, economic motivation and management orientation had showed positive and significant relationship, while self-education, family size, experience in dairying, land holding, social participation and training received had exhibited non-significant relationship with adoption behaviour of recommended dairy management practices.

Key words : Dairy farmers, adoption behaviour, production, management.

Introduction

Remarkable progress in the area of livestock development. India has largest livestock population in the world. The total livestock population of India makes up a huge numbers and stands first in cattle and buffalo population, second in goats and third in sheep in the world. India has 57% of the world's buffalo population. Livestock rearing in rural systems is not the primary occupation for the rural population, but serves instead as a support enterprise to agriculture. Mixed herds with goats, sheep, cattle and buffaloes are found in this system. Cattle are reared primarily for drought power and manure, rather than for milk. In this system, crop residues and grazing in community lands form major source of fodder.

National Accounts and Statistics, reported that the value of output from livestock sector at current prices for milk and milk products is Rs 1,64,509 crores, which is 29.9 percent of total output from agriculture and allied sectors and it contributes 6.29 percent of G.D.P. The present growth rate in crop production is around 2 percent,

higher growth rates of 6-8 percent in animal husbandry sector would help in achieving the targeted growth rate of 4 percent for the agriculture sector as a whole. Therefore, there is need to study, document and share, some of the specific experiences of the farmers collected during the field work at grass root level of programme areas. In this context, present research project entitled "A critical study on Dairy Management Practices in Konkan region of Maharashtra state" was undertaken with the following specific objectives.

1. To study the profile characteristics of the dairy farmers.
2. To study the adoption behaviour of the dairy farmers about recommended dairy management practices.

Materials

The present study was conducted in Konkan region of Maharashtra, as dairy farming is one of the important activity of the rural population of our country. The importance of the dairy, as a subsidiary industry to agriculture, has stressed by the National Commission on

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Agriculture. Sampling is a method of selecting a fraction of the population in such a way that the selected sample represents the population. The present study was conducted in Thane, Raigad, Ratnagiri and Sindhudurg districts of Konkan region of Maharashtra state. Two tahsils were selected from each district by considering the criterion of having highest proportion of milch animals (cows and buffaloes).

The respondents were selected by proportionate random sampling method, so that each district represents 25 dairy farmers. Thus, the total sample consisted 200 dairy farmers. ‘Adoption behaviour of the dairy farmers with reference to the dairy management practices’ was the dependent variable for the study. The adoption behaviour consisted four parameters namely, knowledge, extent of adoption and skill was measured with the help of specially developed scale, while attitude towards dairy farming was measured with scheduled developed by Gupta and Sohal (1976). Independent variables namely self-education, family size, experience in dairying, annual income, number of milch animals, milk production, availability of water, land holding, social participation, training received, economic motivation, management orientation were studied.

The Exploratory Survey Research design was used for the present study. In the present study, adoption behaviour was operationalized as the knowledge, skill, and attitude of the dairy farmer with reference to recommended dairy management practices and its extent of adoption by them in their fields.

The overall adoption behaviour score of the respondents was calculated by summing up the score of four parameters, namely knowledge, skill, extent of adoption and attitude. This score was then converted into adoption index by using the following formula.

$$\text{Adoption Behaviour Index} = \frac{\text{Obtained score}}{\text{Obtainable score}} \times 100$$

The obtained final scores were categorized into three groups namely, ‘low’, ‘medium’ and ‘high’, considering the mean (117.7) ± standard deviation (10.19).

S. no.	Category	Adoption behaviour (index)
1.	Low	Up to 104
2.	Medium	Between 105 to 126
3.	High	127 and above

To ascertain the degree of association between the personal traits of the dairy growers and their adoption behaviour, Pearson’s coefficients of correlation (r) were worked out by using the following formula.

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{n}}{\sqrt{\sum X^2 - \frac{(\sum X)^2}{n}} \sqrt{\sum Y^2 - \frac{(\sum Y)^2}{n}}}$$

Where,

r = coefficient of correlation

X = score of independent variable

Y = score of dependent variable

n = number of observations

Results and Discussion

One of the major objectives of the study was to determine the adoption behaviour of the dairy farmers with reference to recommended dairy management practices. It was studied with the help of the parameters namely knowledge level, attitude, skill and extent of adoption of dairy management practices by the dairy farmers. The results pertaining to these parameters are given here under.

1. Knowledge

In the present study, knowledge refers to know-how about different dairy management practices adopted by the dairy farmers. Adequate knowledge is essential to dairy farmers for the success and profitable dairy farming. It was therefore, thought necessary to obtain information from the dairy farmers about the knowledge of dairy management practices. The data regarding level of knowledge are given in table 1.

Table 1 : Distribution of the respondents according to overall knowledge level about recommended dairy management practices.

S. no.	Overall knowledge (score)	Total respondents (N=200)	
		Number	Percentage
1	Low (Up to 30)	25	12.50
2	Medium (31 to 34)	71	35.50
3	High (35 and above)	104	52.00
(Average: 34.38) Total		200	100.00

From table 1 revealed that majority (52.00 per cent) of the respondents were found in ‘high’ category of knowledge level, while 35.50 per cent and 12.50 per cent of the respondents were in ‘medium’ and ‘low’ category of knowledge level about recommended dairy management practices, respectively. The average knowledge score of the respondents was 34.38. It clearly indicates that majority of the dairy farmers have complete

knowledge about the recommended dairy management practices.

Knowledge is one of the important components of adoption behaviour and as such it plays a major role in the covert and overt behaviour of human beings. Once knowledge is acquired, it produces changes in the thinking process. It is assumed that with proper knowledge, both naturally occurring and created one can be used to convert favourable attitude into decisions to adopt innovations.

2. Adoption

The adoption process is the mental process through which an individual passes from first knowledge of an innovation to forming an attitude towards the innovation, to a decision to final adoption. Thus, adoption is a decision to continue full use of an innovation. With a view to find out the level of adoption of recommended dairy management practices study was conducted. The data in this regard are presented in table 2.

Table 2 : Distribution of the respondents according to overall extent of adoption about recommended dairy management practices.

S. no	Overall extent of adoption (Score)	Total Respondents (N=200)	
		Number	Percentage
1	Low (Up to 51)	38	19.00
2	Medium (52 to 65)	129	64.50
3	High (66 and above)	33	16.50
(Average :58.30) Total		200	100.00

From table 2 revealed that majority (64.50 per cent) of the respondents were found in 'medium' category of adoption, while 19.00 per cent and 16.50 per cent of the respondents were in 'low' and 'high' category of adoption, respectively.

The average adoption score of the respondents was 58.30. This brings to notice that majority of the dairy farmers had 'medium' level of adoption of recommended dairy management practices. Hence, efforts should be made to increase the extent of adoption of recommended dairy management practices to higher level.

3. Distribution of the respondents according to their practice wise knowledge and adoption of dairy management practices

The data pertaining to practices wise knowledge and extent of adoption of recommended dairy management practices by the respondents were collected. The information regarding these aspects is given in table 3 (a) to 3 (h).

3.1 Housing management practices

The data with regard to the Housing management practices by the dairy farmers are presented in Table 3(a).

It is noticed from table 3 (a) that among the five practices under housing management practices, maximum respondents (96.50 per cent) had knowledge about 'site of manure pit' with full adoption by 49.50 per cent respondents, followed by 'proper space requirement (M²)' with knowledge among 95.50 per cent and full adoption by 48.50 per cent respondents. In case of 'accessibility' practices, with knowledge among 95.00 per cent and full adoption by 80.50 per cent respondents. While in case of remaining two practices more than sixty per cent dairy farmers had knowledge, and their adoption was noticed mostly at fully level. This observation indicates that, dairy farmers had positive response towards housing management practices, which are important practices in dairy enterprises.

3.2 Health and care management practices

The data with respect to the health and care management practices by the dairy farmers are presented in table 3 (b).

Data related to health and care management practices in table 3 (b) reveal that, 100 per cent of the respondents had knowledge about 'care of sick animals', with 85.50 per cent respondents had adopted this practice fully. In case of other three practices, it was noticed that more than 90.00 per cent of the respondents had knowledge; however, maximum ninety per cent farmers had followed these practices at full and partial level. With respect to last practice in this sub-head *i.e.* 'age at first service', it was noticed that 94.50 per cent respondents had knowledge, with 90.00 per cent of them had fully adopted this practice.

Conclusion can be drawn from these findings that most of the dairy farmers were fully and partially adopting the health and care management practices.

3.3 Breeding management practices

The data with regard to breeding management practices followed by the dairy farmers are presented in table 3 (c).

It is revealed from Table 3 (c) that a 'heat detection' and 'pregnancy diagnosis' practices are known by 100.00 per cent of dairy farmers with more than 60.00 per cent of respondents fully adopt these practices. In case of other two practices, it was noticed that more than 90.00 per cent of the respondents were aware of its knowledge; however, maximum sixty per cent farmers had followed

Table 3 (a) : Distribution of the respondents according to Housing management practices.

(N = 200)

S. no.	Practices	Knowledge		Adoption		
		Yes	No	Fully	Partially	No
1.	Accessibility	190(95.00)	10(05.00)	161(80.50)	27(13.50)	12(06.00)
2.	Water supply	182(91.00)	18(09.00)	170(85.00)	27(13.50)	3(01.50)
3.	Electricity	125(62.50)	75(37.50)	110(55.00)	85(42.50)	5(02.50)
4.	Proper space requirement (M ²)	191(95.50)	9(09.00)	97(48.50)	89(44.50)	14(07.00)
5.	Site of manure pit	193(96.50)	7(03.50)	99(49.50)	82(41.00)	19(09.50)

(Figures in parentheses indicate percentages).

Table 3 (b) : Distribution of the respondents according to health and care management practices.

(N = 200)

S. no.	Practices	Knowledge		Adoption		
		Yes	No	Fully	Partially	No
1.	Care of sick animals	200(100.00)	00(00.00)	171(85.50)	26(13.00)	3(01.50)
2.	Control of Endo and Ecto parasites	190(95.00)	10(05.00)	94(47.00)	94(47.00)	12(06.00)
3.	Vaccination	186(93.00)	14(07.00)	108(54.00)	74(37.00)	18(09.00)
4.	Age at first service	189(94.50)	11(05.50)	180(90.00)	20(10.00)	0(00.00)

(Figures in parentheses indicate percentages).

Table 3 (c) : Distribution of the respondents according to breeding management practices.

(N = 200)

S. no.	Practices	Knowledge		Adoption		
		Yes	No	Fully	Partially	No
1.	Heat detection	200(100.00)	0(00.00)	158(79.00)	42(21.00)	0(00.00)
2.	Method of breeding	186(93.00)	16(08.00)	144(72.00)	49(24.50)	7(03.50)
3.	Time of Artificial Insemination after onset of oestrus	193(96.50)	7(03.50)	113(56.50)	63(31.50)	24(12.00)
4.	Pregnancy diagnosis	200(100.00)	0(00.00)	134(67.00)	56(28.00)	10(05.00)

(Figures in parentheses indicate percentages)

these practices at full and partial level.

3.4 Feed and fodder management practices

The data with regard to feed and fodder management practices followed by the dairy farmers are presented in table 3 (d).

It is noticed from table 3 (d) that 100.00 per cent of the respondents had knowledge about 'daily requirement of dry fodder' and 'daily requirement of clean water for drinking' however its adoption level was noticed more than 80.00 per cent by the dairy farmers. Remaining four practices, it was noticed that more than 90.00 per cent respondents knows about that, with 70.00 per cent had full and partial adoption.

3.5 Clean and hygienic milk production

The data pertaining to the clean and hygienic milk production followed by the respondents are given in table 3 (e).

It is noticed from table 3 (e) that, cent per cent

dairy farmers had knowledge about 'milking shed' and 'Utensils used and their cleaning and sanitization' and it was adopted by more than 80.00 per cent farmers fully, while 97.00 per cent and 91.00 per cent dairy farmers were very well acquainted with the practice like 'condition of breed during milking' and 'Use of disinfectants for udder and teat' with full adoption by 60.00 per cent and 36.50 per cent respondents, respectively.

More than eighty per cent (84.50 per cent) of the dairy farmers had knowledge about 'use of machine milking' but their fully adoption was not observed at satisfactory level (22.00).

3.6 Care and management of pregnant animals

The data with respect to the care and management of pregnant animals followed by the dairy farmers in recommended dairy management practices are presented in table 3 (f).

It is observed from table 3 (f) that 100.00 per cent of

Table 3 (d) : Distribution of the respondents according to feed and fodder management practices. (N = 200)

S. no.	Practices	Knowledge		Adoption		
		Yes	No	Fully	Partially	No
1.	Daily requirement of green fodder	185(92.50)	15(07.50)	132(66.00)	36(18.00)	32(16.00)
2.	Daily requirement of dry fodder	200(100.00)	00(00.00)	168(84.00)	29(14.50)	3(01.50)
3.	Various Feedstuffs	187(93.50)	13(06.50)	120(60.00)	56(28.00)	24(12.00)
4.	Daily requirement of mineral mixture	182(91.00)	18(09.00)	79(39.50)	99(49.50)	22(11.00)
5.	Daily requirement of Concentrates and Dry matter to Pregnant Animal	189(94.50)	11(05.50)	107(53.50)	75(37.50)	18(09.50)
6.	Daily requirement of Clean water for drinking	200(100.00)	0(00.00)	161(80.50)	36(18.00)	3(01.50)

(Figures in parentheses indicate percentages).

Table 3 (e) : Distribution of the respondents according to clean and hygienic milk production. (N=200)

S. no.	Practices	Knowledge		Adoption		
		Yes	No	Fully	Partially	No
1.	Milking shed	200(100.00)	0(00.00)	180(90.00)	20(10.00)	0(00.00)
2.	Machine Milking	169(84.50)	31(15.50)	44(22.00)	95(47.50)	61(30.50)
3.	Condition of breed during milking	194(97.00)	6(03.00)	120(60.00)	66(33.00)	14(07.00)
4.	Utensils used and their cleaning and sanitization	200(100.00)	0(00.00)	169(84.50)	31(15.50)	0(00.00)
5.	Use of disinfectants for udder and teat	182(91.00)	18(09.00)	73(36.50)	100(50.00)	27(13.50)

(Figures in parentheses indicate percentages).

Table 3 (f) : Distribution of the respondents according to care and management of pregnant animals. (N=200)

S. no.	Practices	Knowledge		Adoption		
		Yes	No	Fully	Partially	No
1.	Calving pen	192(96.00)	8(04.00)	150(75.00)	40(20.00)	10(05.00)
2.	Sign of calving	200(100.00)	0(00.00)	136(68.00)	56(28.00)	8(04.00)
3.	Removal of placenta	200(100.00)	0(00.00)	145(72.50)	44(22.00)	11(05.50)

(Figures in parentheses indicate percentages)

the dairy farmers were aware about both the practices *i.e.* 'sign of calving' and 'removal of placenta'. Resultantly, their adoption was satisfactory with 'fully and partially' *i.e.* more than 65.00 per cent.

Remaining one practice *i.e.* 'calving pen' was well known to dairy farmers with more than 70.00 per cent of full adoption.

3.7 Care and management of Calf and Heifer

The data with respect to the care and management of calf and heifer followed by the respondents are presented in table 3 (g).

It is observed from table 3 (g) that 100.00 per cent

dairy farmers had knowledge about 'removal of naval cord' with majority of them were following full adoption of this practice.

Remaining practices *i.e.* 'colostrum feeding', 'castration' 'removal of extra teat' and 'steaming up'. Were well known to more than 85.00 per cent dairy farmers with satisfactory level of adoption.

3.8 Care and management of breeding bull

The data pertaining to the care and management of breeding bull are given in table 3 (h).

It can be observed from table 3 (h) that practices namely 'feeding' and 'service from bull' were known to

Table 3 (g) : Distribution of the respondents according to care and management of calf and heifer. (N= 200)

S. no.	Practices	Knowledge		Adoption		
		Yes	No	Fully	Partially	No
1.	Removal of naval cord	200(100.00)	0(00.00)	175(87.50)	25(12.50)	00(00.00)
2.	Colostrum feeding	193(96.50)	7(03.50)	174(87.00)	26(13.00)	00(00.00)
3.	Removal of extra teat	178(89.00)	22(11.00)	89(44.50)	80(40.00)	31(15.50)
4.	Castration	182(91.00)	18(09.00)	130(65.00)	61(30.50)	09(04.50)
5.	Steaming up	171(85.50)	29(14.50)	119(59.50)	77(38.50)	04(02.00)

(Figures in parentheses indicate percentages)

Table 3 (h) : Distribution of the respondents according to care and management of breeding bull. (N= 200)

S. no.	Practices	Knowledge		Adoption		
		Yes	No	Fully	Partially	No
1.	Age of separation of breeding bull	198(99.00)	2(02.00)	154(77.00)	44(22.00)	2(01.00)
2.	Feeding	200(100.00)	00(00.00)	168(84.00)	32(16.00)	00(00.00)
3.	Service from bull	200(100.00)	00(00.00)	148(74.00)	52(26.00)	00(00.00)
4.	Exercise to breeding bull	179(89.50)	21(10.50)	132(66.00)	57(28.50)	11(05.50)

(Figures in parentheses indicate percentages)

100.00 per cent of the dairy farmers. Looking to the importance of these practices, 100.00 per cent of the dairy farmers had adopted those to 'full and partial' extent. Remaining two practices was very well known to dairy farmers with satisfactory level of adoption.

4. Skill acquired

The data pertaining to skill acquired by the respondents in the use of recommended dairy management practices are given in table 4.

It could be observed from Table 4 that majority (51.00 per cent) of the respondents were in 'medium' category, while 31.50 per cent and 17.50 per cent of the respondents were from 'high' and 'low' category, respectively. These results make it clear that majority of the dairy farmers had acquired the skills in the use of recommended dairy management practices to a satisfactory level. This might have helped them in practicing the techniques efficiently which, in turn, might have helped them in increasing milk production.

4.1 Practice-wise skill acquired by commercial dairy farmers

Further, the analysis was done with respect to various skill oriented practices acquired by the respondents regarding in dairy management. The findings in this regard are presented in table 4.

It is revealed from table 4 that majority (90.00 per cent) of the commercial dairy farmers had skill about 'ringing', while more than one-half of the respondents

had skill acquired in 'culling' (84.00 per cent), 'restraining' (75.50 per cent) and 'casting' (71.50 per cent).

Majority 61.50 per cent, 49.50 per cent and 48.50 per cent of the respondents had skill about 'shoeing' 'silage making' and 'dipping'.

The skill in 'tattooing', 'ear notching', 'chemical method of dehorning', 'mechanical method of dehorning', 'tagging' and 'branding' was acquired very less percentage by the respondents, i.e. 16.50 per cent, 16.50 per cent, 12.50 per cent, 08.50 per cent, 08.50 per cent and 02.50 per cent, respectively.

Conclusion can be drawn from these findings that, majority of the dairy farmers had acquired the skills which were simple and easy to practice, while acquisition of the skills, which were complex in nature was relatively low.

5. Attitude

The data pertaining to attitude of the dairy farmers towards recommended dairy management practices were collected. The information regarding this aspect is given in table 5.

Table 5 reveals that majority (52.00 per cent) of the respondents were found in 'medium' category of attitude towards dairy management practices, while nearly equal number, that is 25.00 per cent and 23.00 per cent of the respondents were in 'high' and 'low' category of attitude.

Majority of the respondents had favourable attitude towards recommended dairy management practices,

Table 4 : Distribution of the respondents according to skill acquired in the use of recommended dairy management practices.

S. no.	Skill acquired (Score)	Total Respondents (N=200)	
		Number	Percentage
1	Low (Up to 4)	35	17.50
2	Medium (5 to 7)	102	51.00
3	High (8 and above)	63	31.50
(Mean:6.26) Total		200	100.00

Table 5 : Distribution of the respondents according to practice-wise skill acquired in recommended dairy management practices.

S. no.	Skill oriented practices	Respondents (N = 200)	Percentage
I. Dehorning			
1.	Chemical method	25	12.50
2.	Mechanical method	17	08.50
3.	Electrical method	08	04.00
II. Restraining and casting of animal			
1.	Restraining	151	75.50
2.	Casting	143	71.50
III. Ringing		181	90.50
IV. Shoeing		123	61.50
V. Culling		168	84.00
VI. Deworming		152	76.00
VII. Dipping		97	48.50
VIII. Marking of animal for identification			
1.	Tattooing:	33	16.50
2.	Ear notching:	33	16.50
3.	Tagging:	17	08.50
4.	Branding	05	02.50
IX. Silage making		99	49.50

possibly because of the encouraging results of this technology received by them. However, still there is scope for extension workers to improve the attitude of dairy farmers by educating them and ensuring that they get good returns after adopting this technology.

6. Adoption behaviour

Available empirical evidences contained in knowledge, extent of adoption, skill and attitude of dairy farmers were useful to know their adoption behaviour. By summing up the scores of all the four selected

Table 5 : Distribution of the respondents according to attitude towards recommended dairy management practices.

S. no	Attitude (Score)	Total Respondents (N=200)	
		Number	Percentage
1	Low (Up to 17)	46	23.00
2	Medium (18 to 20)	104	52.00
3	High (21 and above)	50	25.00
(Mean:18.93) Total		200	100.00

Table 6 : Distribution of the respondents according to their overall adoption behaviour.

S. no.	Overall adoption behaviour (Index)	Total Respondents (N=200)	
		Number	Percentage
1	Low (Up to 104)	34	17.00
2	Medium (105 to 126)	143	71.50
3	High (127 and above)	23	11.50
(Mean:117.7) Total		200	100.00

parameters, overall adoption behaviour index of the respondents was worked out and they were grouped into three categories as shown in table 6.

It is seen from table 6 that more than three-fifth (71.50 per cent) of the respondents had 'medium' adoption behaviour, while adoption behaviour of 17.00 per cent and 11.50 per cent of the respondents was 'low' and 'high', respectively.

These findings are indicative of differential adoption behaviour of the dairy farmers and also of the scope for improving it. The performance of the dairy farmers on various components of adoption behaviour was varying in nature. It is needless to say that the situation of the dairy farmers with regard to all the selected parameters needs to be improved by undertaking appropriate measures by the research and development departments. It is an established fact that better adoption behaviour of the farmers results into higher milk production.

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