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Effectiveness of the mobile app dairy utkal among the field veterinarians of Odisha

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Abstract

Mobile Apps' development and its use in agriculture and allied sectors synergize the growth of Indian agriculture. There is a need to harness benefits of use of social media by the veterinarians, para-veterinarians and A.H. Extension professionals in Animal Husbandry sector, who play a major role in disseminating technologies and innovations to the farmers. The study was conducted among 120 field veterinarians of six districts of Odisha. The information needs of the veterinarian on dairy husbandry activities were collected and analysed using 3-point continuum scale. The app "DAIRY UTKAL" was developed based on the analysed information needs. The effectiveness of the app was analysed after two months. The analysis was done using IBM SPSS 25.0. The data revealed that the information provided in the app on Normal Health parameters of dairy animals ranked first with the mean score 1.97 followed by Dairy Products ranked II (1.93), Diseases - III (1.88), Drugs related to dairy husbandry - IV (1.86), Dairy Schemes - V (1.81), Nutrition - VI (1.80), Housing - VII (1.74) and Breeds - VIII (1.67), respectively, which was found to be effective among the field veterinarians of Odisha. This study will help to provide a database on technical information in a concise form among the field veterinarians for better service delivery and help the dairy farmers to increase their production.

Keywords: Mobile app, field veterinarians, dairy husbandry, information needs

Introduction

Mobile Apps' development and its use in agriculture and allied sectors synergize the growth of Indian agriculture. More than 80% of people of Odisha live in rural areas and about 61.8% of its 17.5 million workforce is employed in agriculture and allied sectors which contributes 18% to the state's GDP (Samrudhi, 2020) [7]. Livestock has contributed significantly to the increase in farmers' incomes in Odisha and dairying has been the main source of income for landless and marginal farmers of the state. It has been observed that in high yielding dairy herds, there is increased incidence of anoestrus (Dailey *et al.*, 1983) [3], mastitis (Maity, *et al.*, 2020) [4] which is affecting farmers income. There is a need for field functionaries to get the required information related to breeding, feeding, health and management of animals to keep them updated with latest development in the animal husbandry sector. The timely assessment of information in veterinary sector for decision making is required to support the livestock production in country. It is necessary to equip the Animal Husbandry Extension personnel with Social Media concepts, applications and communication strategies in order to harness the benefits of social media for smartest means of sharing of livestock practice information among the farming community. The poultry expert system is an IT enabled tool that can help the experts to transfer their advices to multiple locations at the same time with ease (Raju and Rao, 2006) [6]. It was opined that the livestock sector should inculcate need based, location specific and contents in vernacular languages in the form of software (Tiwari *et al.*, 2010) [9]. It was found out that mobile devices are widespread among veterinarians with majority of the respondents strongly agreeing to the fact that mobile technology can enhance patient care, client communication, access to clinical data and medical literature (Andrews *et al.*, 2015) [1]. A study conducted by Nanda *et al.* (2020) [5] revealed that field veterinarians of urban areas in coastal Odisha required significantly more information on normal health parameters of dairy animals compared to rural areas.

Materials and Methods

This study was conducted in six districts of Odisha namely Ganjam, Puri, Kendrapara,

Jagatsinghpur, Bhadrak and Balasore mostly located in the coastal belt of Odisha where the dairy is a potential enterprise for livelihood support. 20 field veterinarians with at least one year of field experience were selected at random from each of the above-mentioned districts having a total sample of 120 respondents. A structured interview schedule was used for collection of data on the information needs of the field veterinarians. The information need was rated at 3-point continuum scale of Much Needed (2), Less Needed (1) and Not Needed (0) respectively. The mean value was calculated. The statistical analysis of the data was made using IBM SPSS 25.0. (IBM, 2017) [2] A mobile app "DAIRY UTKAL" was developed. The language used for the Android App was Java while the platform used was Android Studio 3.6.3. The app contains information on Dairy Breeds, Housing, Nutrition, Diseases, Schemes, Normal Health Parameters of Dairy animals and Drugs used in dairy Husbandry. Such information was duly vetted by the respective experts. This app was uploaded in Google Play Store on 2nd April, 2020. Further study was also conducted to assess the effectiveness in use of the app in accessing such information by the same respondent veterinarians after two months. The effectiveness of the app was analysed after obtaining responses in a 3-point continuum scale of Most Effective (2), Least Effective (1) and Not Effective (0) respectively. Mean value was obtained and compared with that of the values obtained from the information needs.

Results and discussion

Information needs on Dairy Breeds

It was found that 1.7% respondents were in much need of the information on Lactational milk yield of cattle breeds followed by 73.3% on native tract of cattle breeds (table-1). 45% of respondents expressed the information on different exotic breeds was less needed and 43.3% expressed not needed. The data revealed that 12.5% of respondent veterinarians expressed that the information on buffalo breeds of Odisha was much needed as against 35% expressed buffalo breeds of India. The reason for giving more importance to acquire some of the information through the App by the respondents as stated in the table below might be to enrich them with knowledge to face the quarries of the farmers.

It was observed from the results that majority of respondents (98.3%) gave priority for accessing the information on average milk yield per lactation/per day of cattle and buffalo breeds as the Lactational milk yield is considered as an important basis of selection of the cow. It was also observed from the table above that, majority of the respondents opined that the information on native tract of cattle breeds (98.3%) and on native tract of buffalo breeds (85.8%) were much needed owing to the fact that those information were required to refer while imparting training to the Dairy farmers at different places.

Information needs on Dairy Housing

More than 78.00% respondents were in much need of the information on housing for pregnant cattle and buffaloes followed by 75.80% on different types of housing systems practiced in India (Table 2). The respondent veterinarians might have faced the queries of dairy farmers on the care and management of pregnant cattle and buffalo frequently as well the same reason may be in case of types of housing system practised in Odisha and India. It was found that 35.80% of respondents gave their opinion that housing for bulls were

much needed due to Govt. initiation to conserve the local breeds through breeding of local elite bulls for which there is requirement of construction of the bull farms in the state.

The information on different types of housing systems practiced in India as well as Odisha and housing for pregnant cattle and buffaloes were sought by the majority of the respondent veterinarians (96.79%) as they thought that this information were required frequently by the dairy farmers for economising their Dairy Houses. Non availability of adequate farm land may be the reason for accessing information on space requirement for cattle and buffaloes of different age groups for which they made efforts to economize their dairy farms with minimum land. So, they frequently consulted with veterinarians for seeking the space requirements information for cattle and buffalo. Some respondent veterinarians (45.80%) opined that the App was very much effective in providing the information on housing of bulls. Government has taken an initiative to conserve the indigenous cattle through up gradation of local cattle for which, there is a need to establish the bull farms.

Information needs on Dairy Nutrition

Information on fodder cycle, preparation of ration for pregnant cattle and buffaloes were in much (97.50%) needed by the respondent veterinarians. (Table 3). Whereas 100% of the respondents opined that type of fodder to be grown and their cycle is much more needed for a dairy farmer. Also conserving fodder as of hay and silage, their preparation methods were of great use by the veterinarians.

Information needs on Dairy Diseases

Almost all the respondent veterinarians (95.80%) opined that the information on prevention of diseases (Table 4) was much needed followed by parasitic diseases and viral diseases (94.20%). They were of the knowledge that the prevention of diseases, parasitic and viral diseases should be given priority to save the farmers from the economic loss. 98.3% of the respondents were much effectively accessing the App for the information on different causative organisms involved for producing diseases. Early diagnosis and appropriate treatment of the diseases may be the reason of frequent accessing such information. Moreover, the result revealed that more than 88.0% of the veterinarians were accessing the dairy disease related information provided in the app "DAIRY UTKAL" effectively as this app helps as ready reckoner.

Information needs on Dairy Products

85.0% respondents were much interested to know the information on economics of different dairy products; as the farmers to make the dairy business profitable through preparation of value-added milk products (Table 5). Only 35% respondents were much interested to know about preparation of peda. The reason of much accessing the information on preparation of peda, preparation of khoa and preparation of ghee might be to acquire more knowledge to advise the farmers for preparation of such products. Moreover, this information was not readily available to refer in the field situation for which, the veterinarians were accessing this App.

Information needs on Dairy Schemes

The result reveals that 60.8% of the respondent veterinarians were in much need of information on dairy entrepreneurship schemes, followed by schemes of Government of Odisha on

cattle and buffalo management and 52.5% on schemes on central Government on cattle and buffalo management, respectively (Table 6). The reason of showing much interest related to the above information might be to support the farmers, interested to start dairy enterprise and facilities available in different Govt. schemes.

The information of schemes on Dairy Entrepreneurship was much required and frequently accessed by majority respondent veterinarians (85.5%) the reason being to render the advisory services to the dairy farmers for initiating the dairy enterprises. As such, at present Government of Odisha is giving emphasis on development of Dairy Entrepreneurs under different self-employment programmes. Therefore, it might be an imperative requirement for the veterinarians to acquire more and more knowledge on the process of dairy

entrepreneurship development and the facilities provided by the Government so that they would be able to face the queries of the Dairy farmers.

Information needs on normal health parameters of dairy animals

Respondent veterinarians more than 95.80% were much interested to know about the haematological parameters followed by 86.7% biochemical parameters and 85% on physiological parameters. (Fig 1) to rationalise the diagnosis and treatment. Majority (97.23%) of the respondents were effectively accessing the data on all the normal health parameters of dairy animals such as haematological, biochemical and physiological in order to enrich their knowledge and diagnose and treat the disease effectively.

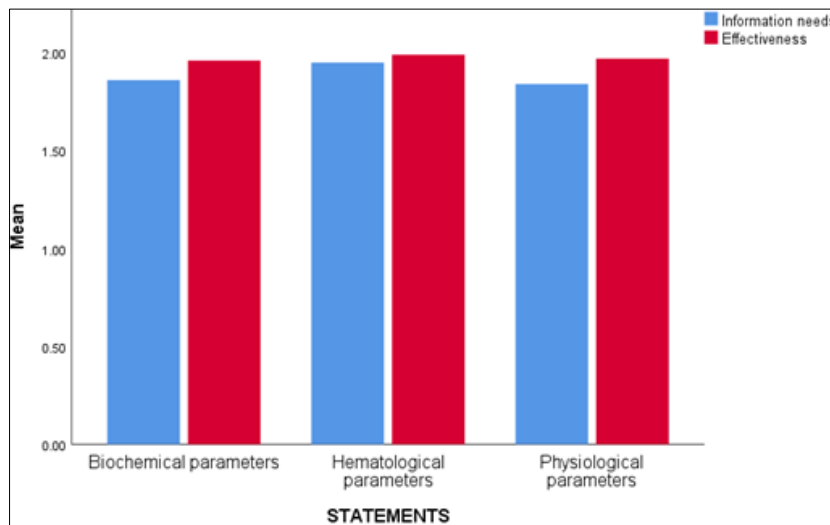


Fig 1: Effectiveness of information on normal health parameters of dairy animals in the app

Information needs on drugs related to dairy husbandry

Respondents (77.50%) were interested to know about the information on antibiotics, followed by anti-inflammatory (76.70%), vaccines (75.80%) and on indications of drugs for different diseases (75.00% (Fig 2) to enhance the effectiveness in the treatment and cure the diseases of animals in general and dairy cows in particular. Similarly, the veterinarians were giving much interest on knowing about vaccines and use of different drugs against different diseases

for preventing spread of diseases as well as for accuracy of treatment respectively.

The result revealed that majority of the respondents (96.7%) for each, were in much need of the information on drugs used for treatment of ectoparasites, dose rates of different medicines, use of different drugs to treat different diseases, respectively. The reason for more usage of such information might be that the need for these information was more in the field conditions.

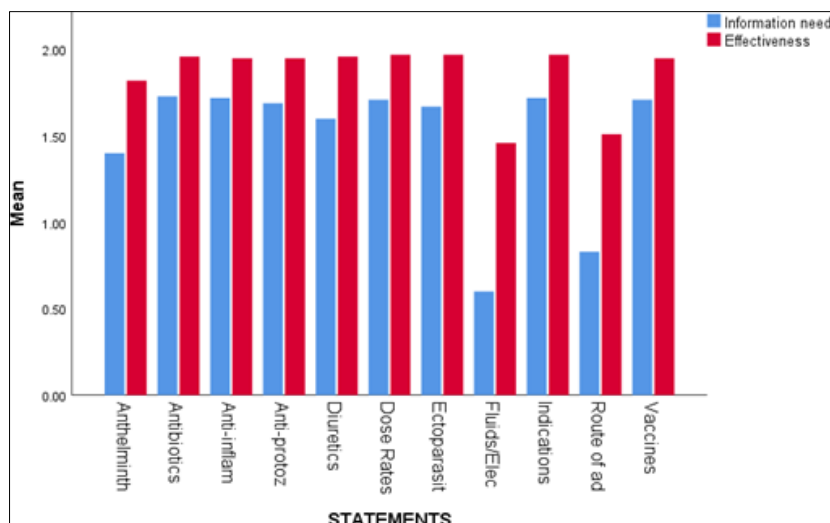


Fig 2: Effectiveness of information on drugs related to dairy husbandry in the app

Comparative effectiveness in use of App for information on Dairy practice

The Fig. 3 represents that the app “DAIRY UTKAL” was found to be effective in providing information to the respondent veterinarians. Accessing information on normal health parameters was given much priority followed by dairy products, dairy diseases, drugs used for treatment, dairy

nutrition and dairy housing. It could be elicited that, the respondent veterinarians were giving priority on diseases diagnosis, treatment and advisory to the dairy farmers to economize the dairy business through value addition of dairy products by accessing the information through the said App. Similarly, dairy management activities were also given next priority.

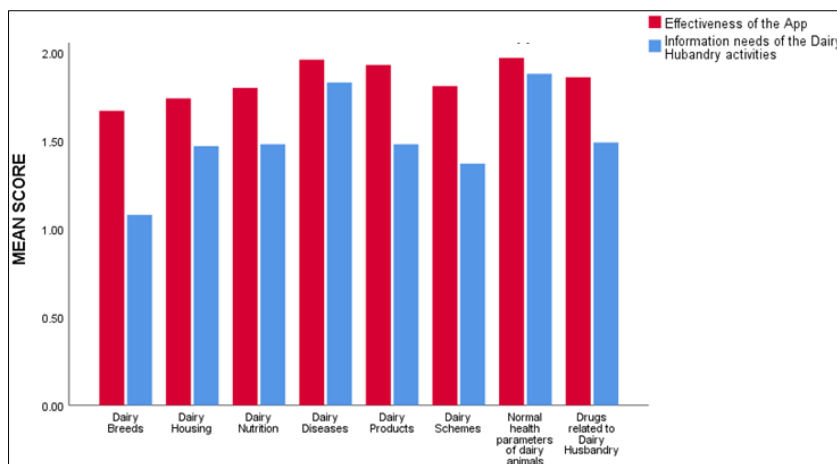


Fig 3: Comparison between mean score of information needs of the husbandry effectiveness of the “DAIRY UTKAL” app

Table 1: Effectiveness of information on dairy breeds in the “DAIRY UTKAL” app

Sl. No.	Statements	Response for information needs			Mean Score of information needs	Effectiveness of the app			Mean score of effectiveness
		MN	LN	NN		ME	LE	NE	
1	Cattle breeds of Odisha	0 (0.0)	7 (5.8)	113 (94.2)	0.06	13 (10.8)	107 (89.2)	0 (0)	1.11
2	Cattle breeds of India	3 (2.5)	11 (9.2)	106 (88.3)	0.14	13 (10.8)	106 (88.3)	1 (0.8)	1.10
3	Exotic cattle breeds	14 (11.7)	54 (45.0)	52 (43.3)	0.68	70 (58.3)	50 (41.7)	0 (0)	1.58
4	Buffalo breeds of Odisha	15 (12.5)	50 (41.7)	55 (45.8)	0.67	65 (54.2)	55 (45.8)	0 (0)	1.54
5	Buffalo breeds of India	42 (35.0)	36 (30.0)	42 (35.0)	1.00	42 (35.0)	78 (65.0)	0 (0)	1.65
6	Physical appearance of cattle breeds	38 (31.7)	36 (30.0)	46 (38.3)	0.93	77 (64.2)	43 (35.8)	0 (0)	1.64
7	Physical appearance of buffalo breeds	27 (22.5)	41 (34.2)	52 (43.3)	0.79	68 (56.7)	52 (43.3)	0 (0)	1.57
8	Native tract of cattle breeds	82 (68.3)	32 (26.7)	6 (5.0)	1.63	114 (95.0)	6 (5.0)	0 (0)	1.95
9	Native tract of buffalo breeds	88 (73.3)	15 (12.5)	17 (14.2)	1.59	103 (85.8)	17 (14.2)	0 (0)	1.86
10	Average milk yield/lactation (cattle)	98 (81.7)	20 (16.7)	2 (1.6)	1.80	118 (98.3)	2 (1.7)	0 (0)	1.98
11	Average milk yield/lactation (buffalo)	80 (66.7)	26 (21.7)	14 (11.6)	1.55	106 (88.3)	14 (11.7)	0 (0)	1.88
12	Milk yield/day (cattle)	85 (70.8)	24 (20.0)	11 (9.2)	1.62	109 (90.8)	11 (9.2)	0 (0)	1.91
13	Milk yield/day (buffalo)	79 (65.8)	21 (17.5)	20 (16.7)	1.49	102 (85.0)	18 (15.0)	0 (0)	1.85
14	Lactational length of cattle breeds	39 (32.5)	54 (45.0)	27 (22.5)	1.10	93 (77.5)	27 (22.5)	0 (0)	1.78
15	Lactational length of buffalo breeds	54 (45.0)	31 (25.8)	35 (29.2)	1.16	85 (70.8)	35 (29.2)	0 (0)	1.71
Mean Score due to information needs on Dairy Breeds						1.08			
Mean Score due to effectiveness of information on Dairy Breeds						1.67			

MN: Much Needed, LN: Less Needed, NN: Not Needed
 ME: Much Effective, LE: Less Effective, NE: Not Effective
 (The figures in parentheses indicate percentage)

Table 2: Effectiveness of information on dairy housing in the “DAIRY UTKAL” app

Sl. No.	Statements	Response for information needs			Mean Score of information needs	Effectiveness of the app			Mean score of effectiveness
		MN	LN	NN		ME	LE	NE	
1	Space requirement for cattle	57 (47.5)	47 (39.2)	16 (13.3)	1.34	104 (86.7)	16 (13.3)	0 (0)	1.87
2	Space requirement for buffaloes	68 (56.7)	25 (20.8)	27 (22.5)	1.34	52 (43.3)	51 (42.5)	17 (14.2)	1.29
3	Housing systems practiced in India	91 (75.8)	25 (20.9)	4 (3.3)	1.72	116 (96.7)	4 (3.3)	0 (0)	1.97
4	Housing systems practiced in Odisha	79 (65.9)	37 (30.8)	4 (3.3)	1.62	116 (96.7)	4 (3.3)	0 (0)	1.97
5	Housing for pregnant cattle and buffaloes	94 (78.3)	22 (18.4)	4 (3.3)	1.75	116 (96.7)	4 (3.3)	0 (0)	1.97
6	Housing for bulls	43 (35.8)	41 (34.2)	36 (30.0)	1.06	55 (45.8)	53 (44.2)	12 (10.0)	1.36
Mean Score due to information needs on Dairy Housing						1.47			
Mean Score due to effectiveness of information on Dairy Housing						1.74			

MN: Much Needed, LN: Less Needed, NN: Not Needed
 ME: Much Effective, LE: Less Effective, NE: Not Effective
 (The figures in parentheses indicate percentage)

Table 3: Effectiveness of information on dairy nutrition in the “DAIRY UTKAL” app

Sl. No.	Statements	Response for information needs			Mean Score of information needs	Effectiveness of the app			Mean score of effectiveness
		MN	LN	NN		ME	LE	NE	
1	Ration for Dairy Cattle	71 (59.2)	25 (20.8)	24 (20.0)	1.39	96 (80)	24 (20)	0 (0)	1.80
2	Ration for Buffaloes	91 (75.8)	9 (7.5)	20 (16.7)	1.59	27 (22.5)	86 (71.7)	7 (5.8)	1.17
3	Ration for pregnant Cattles and Buffaloes	117 (97.5)	2 (1.7)	1 (0.8)	1.97	119 (99.2)	1 (0.8)	0 (0)	1.99
4	Maintenance ration for Cattle and Buffaloes	99 (82.5)	20 (16.7)	1 (0.8)	1.82	119 (99.2)	1 (0.8)	0 (0)	1.99
5	Fodder grown in Odisha	44 (36.7)	35 (29.2)	41 (34.1)	1.02	79 (65.8)	41 (34.2)	0 (0)	1.66
6	Fodder grown in India	41 (34.2)	48 (40.0)	31 (25.8)	1.08	88 (73.3)	32 (26.7)	0 (0)	1.73
7	Non-Leguminous fodder	41 (34.2)	49 (40.8)	30 (25.0)	1.09	90 (75)	30 (25.0)	0 (0)	1.75
8	Leguminous fodder	45 (37.5)	47 (39.2)	28 (23.3)	1.14	90 (75)	30 (25.0)	0 (0)	1.75
9	Fodder Grasses	108 (90.0)	5 (4.2)	7 (5.8)	1.84	113 (94.2)	7 (5.8)	0 (0)	1.94
10	Preparation of Hay	55 (45.8)	58 (48.4)	7 (5.8)	1.40	113 (94.2)	7 (5.8)	0 (0)	1.94
11	Preparation of Silage	58 (48.3)	53 (44.2)	9 (7.5)	1.41	111 (92.5)	9 (7.5)	0 (0)	1.92
12	Fodder Cycle	117 (97.5)	3 (2.5)	0 (0.0)	1.97	120 (100)	0 (0)	0 (0)	2.00
Mean Score due to information needs on Dairy Nutrition						1.48			
Mean Score due to effectiveness of information on Dairy Nutrition						1.80			

MN: Much Needed, LN: Less Needed, NN: Not Needed

ME: Much Effective, LE: Less Effective, NE: Not Effective

(The figures in parentheses indicate percentage)

Table 4: Effectiveness of information on dairy diseases in the “DAIRY UTKAL” app

Sl. No.	Statements	Response for information needs			Mean Score of information needs	Effectiveness of the app			Mean score of effectiveness
		MN	LN	NN		ME	LE	NE	
1	Bacterial Diseases	92 (76.7)	27 (22.5)	1(0.8)	1.76	108 (90.0)	12 (10.0)	0 (0)	1.90
2	Viral Diseases	113 (94.2)	6 (5.0)	1(0.8)	1.93	110 (91.7)	10 (8.3)	0 (0)	1.92
3	Parasitic Diseases	113 (94.2)	6 (5.0)	1(0.8)	1.93	109 (90.8)	11 (9.2)	0 (0)	1.91
4	Metabolic Diseases	108 (90.0)	11 (9.2)	1(0.8)	1.89	101 (84.2)	19 (15.8)	0 (0)	1.84
5	Causative Organisms involved	91 (75.8)	27 (22.5)	2(1.7)	1.74	118 (98.3)	2 (1.7)	0 (0)	1.98
6	Prevention of diseases	115 (95.8)	4 (3.4)	1(0.8)	1.95	114 (95.0)	6 (5.0)	0 (0)	1.95
7	Treatment	84 (70.0)	24(20.0)	12(10.0)	1.60	108 (90.0)	12 (10.0)	0 (0)	1.90
8	Age in which disease occurs	105 (87.5)	14(11.7)	1(0.8)	1.87	78 (65.0)	42 (35.0)	0 (0)	1.65
Mean Score due to information needs on Dairy Diseases						1.83			
Mean Score due to effectiveness of information on Dairy Diseases						1.88			

MN: Much Needed, LN: Less Needed, NN: Not Needed

ME: Much Effective, LE: Less Effective, NE: Not Effective

(The figures in parentheses indicate percentage)

Table 5: Effectiveness of information on dairy products in the “DAIRY UTKAL” app

Sl. No.	Statements	Response for information needs			Mean Score of information needs	Effectiveness of the app			Mean score of effectiveness
		MN	LN	NN		ME	LE	NE	
1	Dairy Products	62(51.7)	42(35.0)	16(13.3)	1.38	104 (86.7)	16 (13.3)	0 (0.0)	1.87
2	Preparation of the products	69(57.5)	41(34.2)	10(8.3)	1.49	109 (90.8)	11 (9.2)	0 (0.0)	1.91
3	Economics	102(85.0)	9(7.5)	9(7.5)	1.77	111 (92.5)	9 (7.5)	0 (0.0)	1.92
4	Composition of the products	94(78.3)	15(12.5)	11(9.2)	1.69	109 (90.8)	11 (9.2)	0 (0.0)	1.91
5	Preparation of Khoa	66(55.0)	50(41.7)	4(3.3)	1.52	116 (96.7)	3 (2.5)	1 (0.8)	1.96
6	Preparation of Chhanna	77(64.2)	37(30.8)	6(5.0)	1.59	114 (95.0)	5 (4.2)	1 (0.8)	1.94
7	Preparation of Curd	62(51.7)	52(43.3)	6(5.0)	1.47	114 (95.0)	6 (5.0)	0 (0.0)	1.95
8	Preparation of favoured milk	48(40.0)	63(52.5)	9(7.5)	1.32	111 (92.5)	9 (7.5)	0 (0.0)	1.92
9	Preparation of Ghee	58(48.3)	57(47.5)	5(4.2)	1.44	115 (95.8)	5 (4.2)	0 (0.0)	1.96
10	Preparation of Paneer	65(54.2)	43(35.8)	12(10.0)	1.44	108 (90.0)	12 (10.0)	0 (0.0)	1.90
11	Preparation of Peda	42(35.0)	76(63.3)	2(1.7)	1.33	118 (98.3)	2 (1.7)	0 (0.0)	1.98
12	Preparation of Sweet Curd	47(39.2)	69(57.5)	4(3.3)	1.36	116 (96.7)	4 (3.3)	0 (0.0)	1.97
Mean Score due to information needs on Dairy Products						1.48			
Mean Score due to effectiveness of information on Dairy Products						1.93			

MN: Much Needed, LN: Less Needed, NN: Not Needed

ME: Much Effective, LE: Less Effective, NE: Not Effective

(The figures in parentheses indicate percentage)

Table 6: Effectiveness of information on dairy schemes in the “DAIRY UTKAL” app

Sl. No.	Statements	Response for information needs			Mean Score of information needs	Effectiveness of the app			Mean score of effectiveness
		MN	LN	NN		ME	LE	NE	
1	Schemes of Govt. of Odisha on cattle and buffalo management	65 (54.2)	32 (26.7)	23 (19.1)	1.35	96 (80.0)	24 (20.0)	0 (0.0)	1.80
2	Schemes of Govt. of India on cattle and buffalo management	63 (52.5)	30 (25.0)	27 (22.5)	1.30	93 (77.5)	27 (22.5)	0 (0.0)	1.77
3	Schemes of dairy entrepreneurship	73 (60.8)	30 (25.0)	17 (14.2)	1.47	103 (85.8)	17 (14.2)	0 (0.0)	1.86
Mean score due to information needs on dairy schemes					1.37				
Mean Score due to information needs on Dairy Schemes					1.81				

MN: Much Needed, LN: Less Needed, NN: Not Needed

ME: Much Effective, LE: Less Effective, NE: Not Effective

(The figures in parentheses indicate percentage)

Conclusions

This study will help to provide a database on technical information in a concise form among the field veterinarians to provide better health care and advisory, better nutrition, housing and product preparation. The subheadings of the app may be modified as per the need of the stakeholders of other states of India for effective and economic utilization.

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