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ASSESSING DAIRY FARMER'S KNOWLEDGE ON UTILIZATION OF ICT TOOLS

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ABSTRACT

Information and Communication Technology (ICT) has revolutionized current development in dairy sector. With the ever-increasing need to keep up with the advancements of modern technology, it is imperative for dairy farmers to develop a comprehensive understanding of ICTs. The current study explored the knowledge of dairy farmers on utilization of ICT tools. This research was carried out in Dharwad and Belagavi districts of North Karnataka employing an Ex- post facto research design. From each district, two taluks and from each taluk two hoblis were selected randomly. Thereafter, fifteen dairy farmers were randomly selected from each hobli, resulting in a total sample size of 120. They were interviewed with the help of structured pre-tested interview schedule. The information was gathered through a pre-tested structured interview schedule and analysis was done by applying appropriate statistical tools viz., frequency, percentage, mean, standard deviation, correlation and regression analysis. The results indicated that majority (61.67 %) of the dairy farmers had medium knowledge on ICT tools. Cent per cent of dairy farmers had specific knowledge about use of TV and mobile phone among gadgets and majority had specific knowledge about YouTube and WhatsApp among applications. The dairy farmers knowledge of ICT tools had positively significant relationship with education, source consultancy pattern and ICT tools possession. In order to transfer information and skills on various ICT tools, hands-on training is required.

Keywords: *applications, dairy farmers, gadgets, ict tools, knowledge*

INTRODUCTION

Information and Communication Technology (ICT) tools have revolutionized current development in dairy sectors. Innovations in information and communication technology is due to wide spread of internet access and mobile communications that offer solutions to information needs of farmers in dairy sector (Bharath *et al.,* 2024). ICT is one such paradigm in the current era that can offer timely, affordable and accurate information for the rural people (Monikha *et al.,* 2021; Pratik and Vinaya, 2022; Patel et al., et al., 2023). ICT has proven to be an effective extension strategy for accelerating progress across multiple sectors, predominantly in agriculture (Kashem *et al.,* 2010) and also ICT tools are used by the costal farmers during natural calamities (Mallick et al., 2023). ICT has enabled effective knowledge exchange between researchers, extension personnel, and farmers within the agricultural community (Adegbidi, 2012 & Panda *et al.,* 2019).

The knowledge of ICTs among dairy farmers is a critical factor in improving productivity and efficiency in the dairy sector. With the ever-increasing need to updated with the advancements of modern technology, it is imperative for dairy farmers to develop a comprehensive understanding of ICTs. Dairy farmers must have the ability to understand the intricacies of different technologies and successfully apply them in their context of the dairy farming. By comprehending the multidimensional nature of ICTs in the dairy farming sector, dairy farmers can effectively integrate these technologies into their farming practices. Keeping this in view, the present investigation was taken up to know the dairy farmers knowledge of ICT tools utilization in North Karnataka.

OBJECTIVE

To assess dairy farmer's knowledge on utilization of ICT tools

METHODOLOGY

This research was carried out in two districts of North Karnataka during the year 2023 employing an *Ex-post facto* research design. Through purposive sampling, two districts (Dharwad and Belagavi) were chosen from North Karnataka, as dairy animals' population in these districts

was high. From each district, two taluks and from each taluk two hoblis were selected randomly. Thereafter, fifteen dairy farmers were randomly selected from each hobli, resulting in a total sample size of 120 (who were using at least one ICT tools). The information was gathered through a pre-tested structured interview schedule and analysis was done using descriptive statistics viz., frequency, percentage, mean, standard deviation in MS Excel (Version, 2011). The degree of association between independent variables and knowledge of various ICT tools was determined through correlation and regression analysis in SPSS V.26. To assess the dairy farmers knowledge of ICT tools, a teacher made interview schedule was framed in consultation with experts in the field, veterinary officers and scientists. Knowledge questions with two possible answers (yes or no) were included in a list of prepared knowledge items. Quantification of knowledge item answers was made by giving a score of one or zero for yes or no, respectively. The summation of the score for the answers of a particular respondent indicates his/her knowledge of ICT tools. Based on the total score, knowledge index was calculated using the formula given below,

$$\text{Knowledge Index (\%)} = \frac{\text{Obtained score}}{\text{Maximum score}} \times 100$$

Based on the total scores, the respondents were grouped into three categories as low, medium and high using mean and standard deviation as measures of check.

RESULTS AND DISCUSSION

Dairy farmers overall knowledge of ICT tools

Table 1: Overall distribution of dairy farmers according to their knowledge of ICT tools

(n =120)

Sr. No.	Category	Frequency	Percentage
1	**Low** (< 18.80)	33	27.50
2	**Medium** (18.80 to 24.77)	74	61.67
3	**High** (> 24.77)	13	10.83
Mean = 21.78			SD =7.03

The findings in Table 1 showed the overall distribution of dairy farmers based on their ICT tool knowledge. It showed that the majority of dairy farmers (61.67 %) had medium ICT tool knowledge, followed by 27.50 and 10.83 per cent had low and high knowledge on ICT tools, respectively. The dairy farmers' medium knowledge of ICT tools might be due to less access to dairy related information because of non-possession of high-cost ICT tools. Dairy farmers had good knowledge of those ICTs which they were using in their day-to-day life.

Similar results were reported by Kabir (2015) in his research on farmers' attitudes and levels of knowledge about ICT-based farming and discovered that half of the farmers (50.00 %) had a medium level of knowledge about ICTs. Similar findings were reported by Babu *et al.* (2013), Raghuprasad *et al*. (2013) and Kumari and Kumari (2018).

Dairy farmers knowledge of specific ICT tools

I. Gadgets

A. Radio

The data presented in Table 2 showed the knowledge of dairy farmers on specific ICT tools. With respect to radio, cent per cent of the dairy farmers know that radio is an electronic audio-medium for broadcasting programs. While, 85.83 per cent possessed knowledge that radio facilitates dissemination of modern dairy farming technology. The possible reason behind this may be the dairy farmers' familiarity and affordability of radio as it is cheaper as compared to other ICTs which helped them to comfortably used radio for getting dairy related information.

B. Television

Cent per cent of the dairy farmers had knowledge that TV is an electronic audio-visual medium which provides picture with synchronized sound, disseminates dairying information and other improved dairy farming practices through dairy programs, telecasts dairy news/programs in local language for dairy farmer and TV serves as a medium to create awareness among the dairy farmer about improved dairy practices through different dairy programs. The probable reason might be the user-friendly and visual appealing and ease in understanding nature of TV for getting dairy information. TV aided dairy farmers to get dairy related information through various national and regional language channels like DD Kisan, Krishi Darshan and Chandana TV (in Karnataka).

C. Mobile phone

It was discovered that, cent per cent of the dairy farmers know that mobile phone is a tele-communicating

device and facilitates dairy farmer to communicate directly with the customers for selling milk/dairy products. The probable reason might be the affordability, easy to handle, ability to access real-time dairy information by dairy farmers. Mobile phones enabled dairy farmers to stay connected with veterinary professionals who guided them in managing their livestock.

D. Computer/ Laptop

The data pertinent to dairy farmers knowledge on computer/ laptop revealed that none of the dairy farmers possessed knowledge on computer/ laptop as a programmable machine that receives input, stores and manipulates data and provides output in a useful format. The possible reason may be the high cost of computer/ laptops and dairy farmers perception of difficult to operate and complex nature of gadgets which hindered the dairy farmers to purchase it.

II. Applications

A. YouTube

With regards to YouTube, it is evident from the table 2 that majority (73.33 %) of dairy farmers knows that YouTube is a video sharing technology and allows dairy farmers to watch the videos on dairy farming activities. The possible reasons might be the familiarity, ease in operation, availability of need- based information any- time and anywhere. Dairy farmers access to dairy related information through watching the videos on dairy farming.

B. WhatsApp

With regards to WhatsApp, 69.16 per cent of dairy farmers know that WhatsApp is an internet-based instant messaging application followed by WhatsApp enables to exchange dairy information in the form of test messages, images, photos, audio, video clippings (23.33 %). The probable reason for the low knowledge of dairy farmers on WhatsApp was attributed to the fact, they were using WhatsApp as a general messaging app and were unaware of various national and regional language specific WhatsApp dairy groups.

C. Facebook

It is cleared from the Table 2 that exactly one fourth (25.00 %) of dairy farmers know that Facebook is a website of personal networking technology followed by Facebook allows dairy farmer to post photos and videos related to dairy farming (1.66 %). The probable reason for the low knowledge of dairy farmers to use Facebook was attributed to the fact the they were unaware of its use for dairy related purpose like posting photos and videos related to dairy farming.

D. SMS

With regards to SMS Table 2 also revealed, 25.00 per cent of dairy farmers know that SMS is a text message exchanging technology. While an equal 16.67 per cent of dairy farmers knows that SMS can be used for sending and receiving information on dairy farming and enables to send dairy information to those who don't have smart phone and internet facility. The probable reason for the low knowledge of dairy farmers of SMS might be due to the fact that they were unaware of its use for dairy related purpose like sending and receiving information on dairy farming from veterinary professional.

E. Dairy Apps

With respect to dairy apps, it is observed that a very few (7.50 %) of dairy farmers knows that dairy apps are the mobile-based applications which provides information about dairy farming, provide information on improved dairy farming practices through texts, videos and photographs and dairy apps guide dairy farmer on selection of breeds, breeding, housing management, nutrient management, health care management and marketing. The probable reason for the low knowledge of dairy farmers of dairy apps might be due to the fact that they were unaware of various national and regional language specific dairy apps like Pashu Poshan, Dairy Kannada, Fodder Kannada etc. and were not able to found need-based information through these apps.

III. Print media

A. Newspaper

Table 2 clearly showed that, high majority (89.16 %) of dairy farmers knows that newspaper gives emergency and timely information on dairy breeds, nutrient management, health care management etc. and newspaper create general awareness about improved dairy practices among dairy farmer. The possible reason behind this may be the availability of various national and local language specific newspaper like Times of India, Vijay Karnataka and Praja Vani aided the dairy for accessing dairy related information.

B. Magazine

It was observed from the table 2 that, a very few (4.16 %) of dairy farmers knows that magazines are excellent sources for innovative dairy management practices, provides highly useful information on dairy farming to dairy farmer and magazine gives information on dairy breeding, management and other aspects of dairy farming. The probable reason for the low knowledge of dairy farmers on magazine might be

due to their low formal education, less familiarity and high cost of magazines.

C. Dairy publication

Table 2 revealed that, high majority (90.00 %) of dairy farmers knows that leaflet is a single sheet of paper of small size, containing preliminary information relating to a topic. With respect to folder, 64.16 per cent of dairy farmers know that folder is a single sheet of paper of big size, folded once or twice and gives essential information relating to a particular topic. The possible reason behind this may be that dairy farmers' familiarity and practical exposure, free availability during training, Krishi mela, exhibition etc.

IV. Networking technologies

A. Internet

It was observed that majority (74.16 %) of dairy farmers had knowledge of internet as a wireless networking technology which globally connects computers and other devices to exchange the information and helps in sending and receiving the dairy related information through WhatsApp, Facebook, dairy apps and dairy portals etc. The possible reasons might be familiarity, ease in operation, availability of need- based information any- time and anywhere.

B. Information kiosks

The data pertinent to dairy farmers knowledge on information kiosks revealed that none of the dairy farmers possessed knowledge of information kiosks as computer-based terminal or display that provides information or services in public places and kiosk is like ATM booth where information related to dairy farming is available. The probable reason for the low knowledge of dairy farmers on information kiosks might be due to the fact that they were unaware of its facilities and services due to its non-availability. The results were in line with the findings of Bharat (2021) on his study on use of mobile based information communication technology tools by dairy farmers in Western Maharashtra and found that (63.33 %) of dairy farmers harbored complete knowledge about use of ICT tools. Findings are also in line with the observations made by Olaniyi (2013) and Kumari and Kumari (2018).

Table 2: Distribution of dairy farmers according to their knowledge of specific ICT tools (n =120)

Sr. No.	Particulars	Knowledge		Rank
		f	(%)	
I	**Gadgets**			
A	**Radio**			
1	Radio is an electronic audio-medium for broadcasting programs	120	100.00	I
2	Radio provides recent and timely information on dairy farming	99	82.50	IV
3	Radio serves as a medium to create awareness among the dairy farmer about improved dairy practices	101	84.16	III
	Radio facilitates dissemination of modern dairy farming technology	103	85.83	II
B	**Television**			
1	TV is an electronic audio-visual medium which provides picture with synchronized sound	120	100.00	I
2	TV disseminates dairying information and other improved dairy farming practices through dairy programs	120	100.00	I
3	TV telecasts dairy news/programs in local language for dairy farmer	120	100.00	I
4	TV serves as a medium to create awareness among the dairy farmer about improved dairy practices through different dairy programs	120	100.00	I
C	**Mobile phone**			
1	Mobile phone is a tele-communicating device	120	100.00	I
2	Mobile phone provides new opportunities for dairy farmer through e–marketing and e-transaction	89	74.16	III
3	Mobile phone can assist dairy farmer in communicating their dairy related problems to experts and getting solutions in a better way	117	97.50	II
4	Mobile phone facilitates dairy farmer to communicate directly with the customers for selling milk/ dairy products	120	100.00	I
D	**Computer /Laptop**			

Sr. No.	Particulars	Knowledge		Rank
		f	(%)	
1	Computer/Laptop is a programmable machine that receives input, stores and manipulates data and provides output in a useful format	0	0.00	-
2	Computer/Laptop provides latest information through various dairy portals, apps etc.	0	0.00	-
II	**Applications**			
A	**YouTube**			
1	YouTube is a video sharing technology	88	73.33	I
2	YouTube allows dairy farmers to watch the videos on dairy farming activities	88	73.33	I
3	YouTube allows dairy farmers to watch the downloaded videos in offline mode	20	16.66	II
B	**WhatsApp**			
1	WhatsApp is an internet-based instant messaging application	83	69.16	I
2	WhatsApp enables to exchange dairy information in the form of text messages, images, photos, audio and video clippings	28	23.33	II
3	WhatsApp allows dairy farmer to share information on dairy farming practice in dairy WhatsApp groups	02	1.66	III
C	**Facebook**			
1	Facebook is a website of personal networking technology	30	25.00	I
2	Facebook allows dairy farmer to post photos and videos related to dairy farming	02	1.66	II
3	Facebook is a platform which helps dairy farmer to promote own dairy products through advertising	0	0.00	III
D	**SMS**			
1	SMS is a text message exchanging technology	30	25.00	I
2	SMS can be used for sending and receiving information on dairy farming	20	16.67	II
3	SMS enables to send dairy information to those who don't have smart phone and internet facility	20	16.67	II
E	**Dairy Apps**			
1	Dairy apps are the mobile-based applications which provides information about dairy farming	09	7.50	I
2	Dairy apps provide information on improved dairy farming practices through texts, videos and photographs	09	7.50	I
3	Dairy apps guide dairy farmer on selection of breeds, breeding, housing management, nutrient management, health care management and marketing	09	7.50	I
III	**Print media**			
A	**Newspaper**			
1	Newspaper gives emergency and timely information on dairy breeds, nutrient management, health care management etc.	107	89.16	I
2	Newspaper frequently publishes news on dairying activities and success stories of dairy farmer	104	86.66	II
3	Newspaper creates general awareness about improved dairy practices among dairy farmer	107	89.16	I
B	**Magazine**			
1	Magazine are excellent sources for innovative dairy management practices	05	4.16	I
2	Magazine provides highly useful information on dairy farming to dairy farmer	05	4.16	I
3	Magazine gives information on dairy breeding, management and other aspects of dairy farming	05	4.16	I
C	**Dairy publications**			
a)	**Leaflet**			
1	Leaflet is a single sheet of paper of small size, containing preliminary information relating to a topic	108	90.00	I
2	Leaflet provides specific information on a single idea related to dairy farming	102	85.00	II
b)	**Folder**			

Sr. No.	Particulars	Knowledge		Rank
		f	(%)	
1	Folder is a single sheet of paper of big size, folded once or twice and gives essential information relating to a particular topic	77	64.16	III
2	Folder deals with more than one idea and gives all essential information in a proper sequence related to dairy farming	69	57.50	IV
IV	**Networking technologies**			
A	**Internet**			
	1. Internet is a wireless networking technology which globally connects computers and other devices to exchange the information	89	74.16	I
	2. Internet helps in sending and receiving the dairy related information through WhatsApp, Facebook, dairy apps and dairy portals etc.	89	74.16	I
B	**Information kiosk**			
	1. Information kiosk is a computer- based terminal or display that provides information or services in public places	0	0.00	-
	2. Information kiosk is like ATM booth where information related to dairy farming is available	0	0.00	-

f – Frequency % - Per cent

Association of personal and socio-psychological characteristics of dairy farmers with their knowledge of ICT tools

The data presented in Table 3 showed the association of personal, socio-psychological and economic characteristics of dairy farmers with their knowledge of ICT tools. The dairy farmers knowledge of ICT tools had positively significant relationship with education (0.732), source consultancy pattern (0.738), ICT tools possession (0.856), extension contact (0.855), achievement motivation (0.796), economic motivation (0.808), scientific orientation (0.783), innovativeness (0.855) and credibility of ICTs (0.856) at one per cent level of significance. Whereas, variables namely age (0.530) and experience in dairy farming (0.534) had negatively significant relationship at one per cent level of significance. Further, other variables like occupation, annual income and herd size were non- significantly correlated with the dairy farmers knowledge of ICT tools. The possible reason may be that young age, less experience in dairy farming and higher education encourages individual to gain knowledge on various ICT tools for obtaining dairy farming. Dairy farmers have might get awareness of various ICT tools for obtaining dairy information by having a good number of ICT tools possession and adequate extension contact.

Similar results reported by Rebekka and Saravanan (2015) in their study on access and usage of ICTs for agriculture and rural development by the tribal farmers in Meghalaya, India, found that education and annual income showed positively significant correlation. Similar outcomes also reported by Khodifad and Solanki (2023).

Table 3: Association of personal and socio-psychological characteristics of dairy farmers with their knowledge of ICT tools

(n =120)

Sr. No.	Variables	Correlation Coefficient (r)
X_1	**Age**	-0.530**
X_2	**Education**	0.732**
X_3	**Experience in dairy farming**	-0.534**
X_4	**Occupation**	0.157^{NS}
X_5	**Annual income**	0.065^{NS}
X_6	**Herd size**	0.010^{NS}
X_7	**Source consultancy pattern**	0.738**
X_8	**ICT tools possession**	0.856**
X_9	**Extension contact**	0.855**
X_{10}	**Achievement motivation**	0.796**
X_{11}	**Economic motivation**	0.808**
X_{12}	**Scientific orientation**	0.783**
X_{13}	**Innovativeness**	0.855**
X_{14}	**Credibility of ICTs**	0.856**

**Significant at 1 per cent level

NS- Non-Significant

Relationship between personal and socio- psychological characteristics of dairy farmers with their knowledge of ICT tools

The data presented in Table 4 revealed the relationship between personal, socio- psychological and

economic characteristics dairy farmers with their knowledge of ICT tools. The coefficient of determination (R^2) is 0.864, indicating that 86.40 per cent changes in the dairy farmers knowledge of ICT tools was contributed by all these independent variables chosen for the study. The variables namely education, source consultancy pattern and scientific orientation contributed significantly at one per cent level of significance. Whereas, variables like occupation, ICT tools possession and extension contact contributed significantly at five per cent level of significance. The possible reason might be that higher exposure to formal, informal and mass media sources helps to get knowledge on ICT tools and specifically on how to use these ICT tools for getting dairy related information. Similar results reported by Rebekka and Saravanan (2015) Parmar et al. (2024); Chaudhary et al. (2024); Patel et al. (2024); Naik et al. (2024); Swami et al. (2024); Pandey et al. (2023);and Narendranath (2016).

Table 4 : Relationship between personal and socio-psychological characteristics dairy farmers with their knowledge of ICT tools

(n = 120)

Sr. No.	Variables	Regression coefficient (b)	't'-value
X_1	**Age**	0.315	0.443^{NS}
X_2	**Education**	0.973	3.293**
X_3	**Experience in dairy farming**	0.986	-1.537^{NS}
X_4	**Occupation**	2.272	2.324*
X_5	**Annual income**	0.125	0.684^{NS}
X_6	**Herd size**	0.026	-0.249^{NS}
X_7	**Source consultancy pattern**	0.897	3.127**
X_8	**ICT tools possession**	1.406	2.800*
X_9	**Extension contact**	0.868	2.651*
X_{10}	**Achievement motivation**	0.242	0.420^{NS}
X_{11}	**Economic motivation**	0.238	0.437^{NS}
X_{12}	**Scientific orientation**	0.480	2.795**
X_{13}	**Innovativeness**	0.256	0.611^{NS}
X_{14}	**Credibility of ICTs**	0.417	0.695^{NS}

$R^2 = 0.864$ F= 47.46

**Significant at 1 per cent level

*Significant at 5 per cent level

NS- Non – significant

CONCLUSION

There is a need to impart training on handling skills of various ICT tools and how to use different ICT tools in search information related to dairy farming practices. Dairy farmers exposure to dairy related information through different ICT tools will help them to stay updated with the latest advancements in dairy sector. The adequate information on dairy farmers knowledge will help the line departments of state to have proper orientation for the selection of appropriate ICT tools for the dissemination of dairy related information, as well as various development initiatives in order to address the issues that the dairy farmers are currently facing.

POLICY IMPLICATION

The study highlighted that dairy farmer had medium knowledge of ICT tools. Hence, there is a need to impart hand-on-training for imparting knowledge and skills on various ICT tools and how to use different ICT tools to search information related to dairy farming practices. Further, enhancement of extension contact will help to upsurge knowledge on ICT tools among dairy farmers.

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CONFLICT OF INTEREST

This is to declare that there is "No conflict of interest" among the researcher.

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