

## Research Article



# Effectiveness of the Interactive Web-Module on Knowledge Empowerment of Dairy Farmers

SOMASEKARAN SUBASH<sup>1\*</sup>, JANCY GUPTA<sup>2</sup>, PRASAD BABU GEREKETI<sup>3</sup>

<sup>1</sup>Dairy Extension Section, Southern Regional Station, National Dairy Research Institute, Bangalore, Karnataka, – 560030, India; <sup>2</sup>Dairy Extension Division, National Dairy Research Institute, Karnal, Haryana 132001, India; <sup>3</sup>KVK, ANGRAU, Andhra Pradesh, India.

**Abstract** | Quick dissemination of technological information from the research system to farmers in the field and reporting of farmers' feedback to the research system is one of the critical inputs in transfer of technology. Information and Communication Technology (ICT) is one of the means where its potential can be exploited to strengthen the linkage amongst research system and extension system. In this context, an interactive web module was developed on dairy innovations and it was tested for its effectiveness in terms of knowledge gain by the dairy farmers (n=60) from two states of India viz., Haryana and Tamil Nadu. The study revealed that, the overall mean knowledge gain on dairy innovations through web module was effective ( $p < 0.01$ ) in terms of knowledge gain among the respondents in both regions (Haryana and Tamil Nadu). It is evident from this study that ICT plays an important role in knowledge empowerment of farmers and hence still more institutional support is required in developing such technology transfer mechanisms in countries like India.

**Keywords** | Knowledge empowerment; Web-Module; Dairy Innovations; Knowledge gain

**Editor** | Asghar Ali Kamboh, Sindh Agriculture University, Tandojam, Pakistan.

**Received** | February 11, 2018; **Accepted** | February 23, 2018; **Published** | March 20, 2018

\***Correspondence** | Somasekaran Subash, Dairy Extension Section, Southern Regional Station, National Dairy Research Institute, Bangalore, Karnataka, – 560030, India; **Email:** subashagri@gmail.com

**Citation** | Subash S, Gupta J, Gereketi PB (2018). Effectiveness of the interactive web-module on knowledge empowerment of dairy farmers. *J. Anim. Health Prod.* 6(1): 13-17.

**DOI** | <http://dx.doi.org/10.17582/journal.jahp/2018/6.1.13.17>

**ISSN** | 2308-2801

**Copyright** © 2018 Subash et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

## INTRODUCTION

The Indian livestock system is the endeavor of small holders and it is a centuries old tradition. It is estimated that over 70 percentages of the rural households in India depend on livestock farming for supplementary income. Dairy farmers' especially small holders rarely apply scientific technology for breeding, feeding, health care, and management. Dairying plays important role in improving the nutritional status of the population and its role as a sustainable employment generation. The livelihood security of the farmers through dairying can be increased further by enhancing their access to improved dairy information and communication sources. Quick dissemination of technological information from the livestock research system to end users and feedback to the research stations are critical to the transfer of animal husbandry technology. The information and communication support during the last 50

years has been conventional (Sasidhar and Sharma, 2006). Modern information and communication technologies including the Internet, when applied to conditions in rural areas can help improve communication, increases participation, and disseminate information and share knowledge and skills. It is being said that "Internet" would be the major form of technology dissemination in the near future. The use of such technologies makes extension process faster, efficient and more effective. The 21<sup>st</sup> century has been described as the "Information age". If the rural India can be connected and the "masses" are empowered with "Information", the Indian economy will take a leap forward into the digital millennium with a great speed. Improved communication and information access is directly related to social and economic development (Meena and Singh, 2013). According to the United Nations (UN) ICTs are a 'powerful enabler of developmental goals' (UN Millennium Project 2005); they are expected to bring about 'greater

**Table 1:** Effectiveness of web-module in terms of knowledge gain among the respondents of Haryana Region (R1, n=60)

S.No	Parameters	Mean knowledge Score		Mean knowledge gain	Percent of knowledge gain	T-test value
		Before exposure	Immediately after exposure			
1	Breeding and reproduction	16.13	20.02	3.88**	17.65	11.61
2	General management	11.20	13.90	2.60**	17.33	15.76
3	Clean milk production	8.12	9.53	1.42**	14.17	13.57
4	Feeding, nutrition and fodder management	22.97	27.57	4.60**	15.33	18.11
5	Health care	22.18	26.92	4.73**	15.78	21.74
6	Overall knowledge	80.70	97.93	17.23**	16.11	<b>34.59</b>

\*\* Significant at 0.01 level

social freedoms, increased knowledge and more productive livelihoods' (UNDP 2001) .

Cyber extension is one of the new medium for communication of agricultural innovation with the information technology (IT) application that can be used to expand marketing network, bring together research institutions, development, and assessment with disseminator innovation (extension), educators, farmers and other stakeholders groups which each of them has different types and forms of information will be able in synergy and complementarily (Sumardjo et al., 2010).

The growth and spread of new information and communication technology in rural India in recent years provide a viable alternative to overcome the physical barriers of face-to-face inter-personal communication. Appropriate choice and application of new ICT in diverse rural areas to communicate and educate millions of farm families will help in addressing challenges of agriculture in this millennium. Dissemination of knowledge through appropriate delivery methods plays an important role and it can be multiplied manifold by modern ICT applications such as Internet, websites and mobile etc. Information provided through modern information technology gadgets should be need-based, demand-driven, site-specific and should be in local language (Tiwari et al., 2010). In this context, an interactive web module on dairy innovations was designed and its effectiveness in enhancing knowledge among the dairy farmers was analyzed.

## MATERIALS AND METHODS

The present study was carried out in Haryana and Tamil Nadu state of India. In Northern region (Haryana state) Karnal district 60 dairy farmers were randomly selected.

In Southern region, the respondents were selected purposively from three different districts viz. Vellore, Trichy and Madurai where some ICT projects were already implemented on pilot basis. A total of 60 dairy farmers i.e. 20

from each village, who have been using ICTs were selected randomly. Thus the total sample size from both the regions comprised of 120 dairy farmers.

The study had followed the experimental research design. In this study 'Before-and-After without control design' was used. That is the respondents were subjected to well developed knowledge test in order to ascertain the pre exposure knowledge score and subsequently exposed to the web module on dairy innovations and then reassessed them for the gain on knowledge regarding the dairy innovations to establish web-module as a self-learning tool.

## STATISTICAL ANALYSIS

The knowledge aspects of the dairy innovations were assessed among the dairy farmers through exposure to the developed web module. The knowledge levels of the subjects before and immediately after exposure were assessed to find out the knowledge gain on dairy innovations. The gain in knowledge in different aspects of dairy innovation was taken as an indicator for the effectiveness of the web module in knowledge gain. The mean gain in knowledge also expressed in terms of percentage of knowledge gain. In order to test effectiveness of the developed web module statistically, Paired 't' test was applied to find out, whether there existed any significant difference between the pre-exposure and immediate post-exposure knowledge due to the treatment i.e. exposure to the web module. The results of the gain in knowledge are presented in the following tables with detailed discussion.

## RESULTS AND DISCUSSION

### EFFECTIVENESS OF THE DEVELOPED WEB MODULE IN TERMS OF KNOWLEDGE GAIN

**Northern region (R<sub>1</sub>):** It is evidently clear from the data in Table 1 that majority of the respondents have been benefited by this interactive web module of knowledge dissemination. As we can see that, the overall mean knowledge gain with regard to dairy innovations through developed web module was with a score of 17.23 which indicated

16.11 percent of knowledge gain about dairy innovations among the respondents. This also reinforces the results of (Shanthy and Thiagarajan, 2011) that the results of the post multimedia exposure-test studies indicate that the gain in knowledge ranged from 21.12%. This impact indicates the utility of multimedia as an instructional tool to the farmers. Several people commented positively on the 'multimedia' approach, i.e. where images and sound were incorporated into the resource, stating that this approach was preferred to those that relied on text (Tearle and Dillon 2001). Studies (Roden, 1991; Carlson and Falk, 1989) have shown that superior academic performance was achieved when multimedia forms of instruction were utilized.

A significant amount i.e. 17.65 and 17.33 percents with a mean knowledge gain score i.e. 3.88 and 2.60 of increase in knowledge was found in the areas of breeding and reproduction and general management practices, respectively.

About 15.78, 15.33 and 14.17 percents with a mean knowledge gain score i.e. 1.42, 4.60 and 4.73 of increase in knowledge was found in the areas of health care, feeding, nutrition, fodder management and clean milk production, respectively. As a whole, the percentage of knowledge gain was highest (17.65%) in case of breeding and reproduction followed by general management (17.33%) and health care (15.78%) aspects of dairy innovations. It could be concluded from the above results that, though the percentage of knowledge gain in all the aspects of dairy innovations was not much higher but, a significant increase in number of respondents in knowledge gain category could not be ruled out at the same time. This might be because of the reason that, the farmers especially in northern region did not have much exposure to computer and web sites previously. So if the exposure could be repeated by time and again at least for some time, we could expect that, farmers would feel more comfortable with the new mode of communication technology and it might result in a paradigm shift from lower level to higher knowledge level category.

From the Table 1 it could be seen that the difference between pre-exposure and post-exposure mean knowledge gain score was significant. To confirm it by using paired 't' test, let us take the hypothesis that there is no significant difference in knowledge obtained before and after the web module exposure, i.e. technology dissemination with the help of interactive web module has not been useful. From the table (Table 1), the highly significant 't' values at 1 per cent level of significance noted that the treatment i.e. web module exposure was effective in terms of knowledge gain. And henceforth the hypothesis that there would be no knowledge gain due to the exposure to web module was rejected. Therefore it could be concluded that web module based learning was found to be significant and very effective in communicating the information related to dairy in-

novations among the dairy farmers.

**Southern region (R<sub>2</sub>):** In case of southern region, it could be inferred from the Table 2 that majority of the respondents have been benefited through this interactive web module. As we could observe that, the overall mean knowledge gain with regard to dairy innovations through developed web module was with a score of 29.72 which indicated 27.77 percent of knowledge gain about dairy innovations among the respondents.

It is evident from these results that, a little more than one forth i.e., 27.58 and about 23.11 percents with a mean knowledge gain score i.e. 6.07 and 3.47 of increase in knowledge was found in the areas of breeding and reproduction and general management practices, respectively. About 33.17, 29.94 and 26.28 percents with a mean knowledge gain score i.e. 3.32, 8.98 and 7.88 of increase in knowledge was found in the areas of health care, feeding, nutrition, fodder management and clean milk production, respectively. There is considerable difference in knowledge scores of respondents between pre-exposure and post-exposure of web module on different aspects of dairy innovations. As a whole, the percentage of knowledge gain was highest (33.17%) in case of clean milk production followed by feeding, nutrition, fodder management (29.94%) and breeding and reproduction (27.58%) aspects of dairy innovations. From the above results it could be concluded that, a higher percentage of dairy farmers from southern region had gained knowledge on dairy innovations than the northern region respondents. It is because of the reason that, the respondents in southern region have already been experienced with computer and Internet services through Information communication centre situated in their locality; they felt very comfortable in accessing and gaining more knowledge through interactive web module. In addition to this, awareness about ICTs and education level of the farmers were found to be very favorable in web based technology dissemination. Though the gain in knowledge limits around thirty per cent because of one time-short time period exposure to web module, its effectiveness in technology transfer is noteworthy and beyond any doubt. From the Table 2 it could be seen that the difference between pre-exposure and post-exposure mean knowledge gain scores were significant. The highly significant 't' values at 1 percent level of significance noted that the treatment i.e. web module exposure was effective in terms of knowledge gain. And henceforth the hypothesis that, there would be no gain in knowledge due to the exposure to web module was rejected. Therefore it could be concluded that web module based learning was found to be significant and it could disseminate farm information and there by facilitates in increase one's knowledge, to the desired expectations (Hoogeveen, 1997). There was significant difference between the ICT users and non-ICT users with respect to

**Table 2:** Effectiveness of web-module in terms of knowledge gain among the respondents of Tamil Nadu Region (R2, n=60)

S.N	Parameters	Mean knowledge Score		Mean knowledge gain	Percent of knowledge gain	T-test value
		Before exposure	Immediately after exposure			
1	Breeding and reproduction	12.37	18.43	6.07**	27.58	17.10
2	General management	8.03	11.50	3.47**	23.11	18.76
3	Clean milk production	5.12	8.43	3.32**	33.17	21.93
4	Feeding, nutrition and fodder management	14.48	23.47	8.98**	29.94	23.51
5	Health care	15.67	23.55	7.88**	26.28	21.23
6	Overall knowledge	55.67	85.38	29.72**	27.77	37.69

\*\* Significant at 0.01 level

breeding, feeding, management, health control and total knowledge on dairy farming at 1 per cent level of significance. Similar results were also reported by previous researchers regarding effects of ICT use (Smith and Woody, 2000; Van et al., 2005; Zossou et al., 2009).

Dissemination of the required and recent agricultural information to the farmers in scattered villages at the variegated geographical situation in India is very difficult task. Transfer of technology to farmers is not a onetime exercise because new farm technology is being constantly evolved (Mehta, 2003). Dairy husbandry information is a very important component of the information which is needed by the farmers at the village level in securing their nutritional as well as livelihood security. The benefit of ICT based extension system is to share information or knowledge, to access information swiftly, and to promote the better farming. Amongst farmers level use of ICT gadgets for accessing agricultural related information was generally low due to limited information technology facilities and the limited training facilitates. The past efforts for information dissemination are mainly supply driven rather than demand driven. The world is rapidly shrinking to a global village and the combination of communication and computer has become so powerful that no sector of human activity can afford to ignore it. Hence it would be most appropriate to harness the ICT potential in agriculture (Samaddar and Das, 2008). There is an also high demand for technical know-how on scientific dairy farming practices and its recent innovations among the field extension functionaries, progressive farmers, corporate organizations, policy makers, NGOs and researchers etc. The ICT based extension modules could be effectively used as an extension tool for transfer of technology among the farmers and other interested stakeholders more effectively (Mittal and Mehar, 2016).

## CONCLUSION

It could be concluded from the study that, the web mod-

ule based technology dissemination was found effective among the farmers and it would emerge as a new paradigm in agricultural technology transfer for development of livelihood opportunities for people in the developing countries.

## ACKNOWLEDGEMENTS

This paper forms part of the M.Sc. thesis submitted to ICAR-NDRI Karnal (Deemed University) by the first author. The authors express their gratitude to the national dairy research institute for supporting the research.

## CONFLICT OF INTEREST

The authors have declared no conflict of interest.

## AUTHORS CONTRIBUTION

All authors contributed equally in designing the study, analyzing data and preparing the manuscript.

## REFERENCES

- Carlson HL, Falk DR (1989). Effective Use of Interactive Video Disc Instruction in Understanding and Implementing Cooperative Group Learning with Elementary Pupils in Social Studies and Social Education. *Theory Res. Soc. Edu.* 17: 241-258. <https://doi.org/10.1080/00933104.1989.10505591>
- Hoogeveen M (1997). Toward a Theory of the Effectiveness of Multimedia Systems. *Int. J. Human-Comp. Interact.* 9(2): 151-168.
- Meena HR, Singh YP (2013). Importance of information and communication technology tools among livestock farmers: A review. *Scient. J. Pure Appl. Sci.* 2(2): 57-65.
- Mehta P (2003). Information Technology in Agriculture: Reaching the un reached. Theme paper presented by at national workshop on ICT for Agriculture and Rural Development organized by Indian Association for Information Technology in Agriculture and Dhirubhai Ambani institute for information and communication



- technology.
- Mittal S, Mehar M (2016). Socio-economic factors affecting adoption of modern information and communication technology by farmers in India: Analysis using multivariate probit model. *J. Agric. Edu. Exten.* 22(2): 199-212. <https://doi.org/10.1080/1389224X.2014.997255>
  - Roden S (1991). "Multimedia: The Future of Training". *Multimedia Solutions.* 5(1): 17-19.
  - Samaddar A, Das PK (2008). Changes in Transition: Technology Adoption and Rice Farming in Two Indian Villages. *Agric. Human Values.* 25(4): 541-553. <https://doi.org/10.1007/s10460-008-9150-0>
  - Sasidhar, P. V. K., Sharma, V. P. (2006). Cyber livestock outreach services in India: a model framework. *Livestock Research for Rural Development.* 18(1): 1-12.
  - Shanthy TR, Thiagarajan R (2011). Interactive Multimedia Instruction versus Traditional Training Programmes: Analysis of their Effectiveness and Perception. *J. Agric. Edu. Exten.* 17(5): 459-472. <https://doi.org/10.1080/1389224X.2011.596708>
  - Smith SM, Woody PC (2000). Interactive Effect of Multimedia Instruction and Learning Styles. *Teaching Psychol.* 27(3): 220-223. [https://doi.org/10.1207/S15328023TOP2703\\_10](https://doi.org/10.1207/S15328023TOP2703_10)
  - Sumardjo, Lukman MB, Dan Retno, SH Mulyandari (2010). "Cyber Extension". *Peluang dan Tantangan dalam Revitalisasi Pertanian (Opportunities and Challenges in the Revitalization of Agriculture)*. IPB Press, Bogor.
  - Tearle P, Dillon P (2001). The Development and Evaluation of a Multimedia Resource to Support ICT Training: Design Issues, Training Processes and User Experiences. *Innovat. Edu. Teaching Int.* 38(1): 8-18. <https://doi.org/10.1080/147032901300002819>
  - Tiwari R, Phand S, Sharma MC (2010). Status and scope of information and communication technology for livestock and poultry production in India- A review. *Indian J. Anim. Sci.* 80 (12): 1235-1242
  - UNDP (2001). Information communications technology for development essentials: Synthesis of lessons learned. UNDP Evaluation Office, New York, USA.
  - Van Mele P, Salahuddin A, Magor NP (2005). Innovations in Rural Extension: Case Studies from Bangladesh, Wallingford: CABI Publishing. <https://doi.org/10.1079/9780851990286.0000>
  - Zossou E, Van Mele P, Vodouhe, Simplicie D, Wanvoeke J (2009). Comparing Farmer-to-Farmer Video with Workshops to Train Rural Women in Improved Rice Parboiling in Central Benin . *J. Agric. Edu. Exten.* 15(4): 329 - 339 . <https://doi.org/10.1080/13892240903309561>