



Impact of distance education on dairy farming on learners' knowledge gain, skill development and economic benefits

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ABSTRACT

A study was conducted to assess the impact of the distance education courses on dairy and goat farming on knowledge gained, skills obtained and economic benefits attained by the learners, based on the data collected from 100 respondents randomly selected. A majority of the respondents gained knowledge in credit / insurance (96.50%), housing systems (95.33%), farm economics (83.67%), clean milk production (82.67%), calf rearing (81.67%) and feed and feeding methods (80.33%). The respondents with small herd size (<6.07 cattle units) increased their cattle units by 2.06, while medium farmers (6.07 to 9.10 cattle units) increased farm size by 3.38 cattle and large farmers (>9.10 cattle units) by 5.66 cattle. Further, the small farmer respondents gained a daily average milk yield of 1.64 litres, while medium farmers gained a milk yield of 1.69 litres and large farmers 1.47 litres, with the percentage gain ranging between 48.34 and 66.17. The respondents in small farmer category gained an additional income of Rs.24,637.50 per annum through sale of milk, while medium and large farmers gained Rs.28,554.23 and Rs.53,029.29 per annum, respectively. The per cent gain ranged from 73.38 (medium farmer) to 122.26 (small farmer). There was a highly significant gain in production and income in all categories of farmers with respect to farm size, milk yield, sale of milk, dung and animals and net change in the value of stock.

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Introduction

Distance education is an emerging educational process, for its advantages of learning at learners' doorstep, suitability to transfer knowledge and skill even to the underprivileged, and ability to cover larger clientele. Realising these, the Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) started offering correspondence courses on livestock farming since 1996. With the beneficiaries of these courses largely being livestock farmers and unemployed rural youth, the real impact of these courses on the learners has not been documented. Hence, this study was conducted to assess the impact of the distance education courses offered by TANUVAS on dairy farming of six months duration, in terms of knowledge gained, skills obtained and economic benefits attained by the learners.

Materials and methods

The participants who underwent distance education courses on dairy farming conducted by TANUVAS during the period from 2000-01 to 2004-05 were considered as the respondents for the study. A total of 221 participants completed the distance course on dairy farming during the above period, from whom 100 respondents were selected randomly as shown in Table 1.

Data and analysis

Interview method was followed for data collection. An interview schedule incorporating items pertaining to objective of the study was constructed, pre-tested and finalized for data collection. The data were collected during the period 2007-09 and were coded, tabulated and necessary analytical techniques were used.

Assessment of benefits accrued by learners

The benefits accrued by the learners were measured in terms of gain in knowledge and skill, increase in production and

productivity of farm enterprise performances among the learners of distance education courses, as below:

Knowledge gain

The procedure to measure percentage of knowledge gain followed by Chakarborthy *et al.* (2000) was used. Accordingly, the test statements were prepared based on the course contents of dairy farming course and in consultation with the content developers of the respective courses. A set of 24 questions under nine major heads were selected for the dairy farming course. Each correct answer was given a score of 'one' and 'zero' for the incorrect answer. The total knowledge score of a respondent was worked out by summing up all the scores obtained for each item. Thus the maximum and minimum scores one could obtain ranged from '24' to '0' for the course on dairy farming.

To determine the knowledge gained as a result of distance learning, the knowledge test was administered to every respondent to find the pre-enrolment measurement and post-certification measurement at the time of interview. The difference between pre and post certification knowledge scores of the respondent indicated the gain in knowledge. The percentage gain in knowledge was calculated by adopting the following formula:

$$\% \text{ gain in knowledge} = \frac{(\text{Total score after certification} - \text{Total score before enrolment}) \times 100}{\text{Maximum possible knowledge score}}$$

Maximum possible knowledge score

Skill development

Skill in the present study was defined as the ability of the learner to do / perform scientific practices in dairy farming which they had learnt through the distance education course. To assess the skill gained through distance education programmes, a list of 15 items each for dairy and goat farming courses was prepared in consultation with distance education course

providers and the respective study materials. These 15 items were subjected to the opinion of the extension functionaries to indicate the relative merit of the questions to be included in the final test. Thus, ten items each were included to measure the skill gained by the respondent. The response for skill test of each item was obtained on a five point continuum based on the frequency of skill utilized as detailed below:

Response	Obtained new skill and improved skill over old skill	Obtained new skill	Improved skill over old skill	Did not obtain any skill
Score	3	2	1	0

Weightage was arrived at by measuring the score value with number of respondents based on which total score and mean score was arrived at. The mean score thus arrived was classified and interpreted as obtained new skill and improved over old skill, obtained new skill, improved over old skill and did not provide any skill.

Economic benefits

The production performances were measured by the change in farm size, productivity in terms of daily average milk yield and body weight gain at pre-enrolment and post-certification stages. The difference if any was ascertained and the percentage gain worked out. The production level of the farmers was measured both at pre and post-certification stages. The level of income increase through the sale of milk, animals, dung and products, net change in value of stock, number of inseminations per conception, percentage of mortality, number of animals infected and number of animals insured were ascertained at pre-enrolment and post-certification stages. The actual difference was obtained and worked out in monetary value, along with percentage gain.

Results and discussion

Knowledge gained

The respondents' increased level of knowledge based on percentage gain obtained by the individuals after undergoing the courses and the results are presented in Table 2. It could be observed that a majority gained knowledge in credit / insurance (96.50%) and housing systems (95.33%), followed by farm economics (83.67%), clean milk production (82.67%), calf rearing (81.67%) and feed and feeding methods (80.33%). However, there was lesser gain in areas such as disease control (48%), breeding (37%) and selection of breeds (31%). This low level of gain might also be due to high level of knowledge at pre-enrolment stage itself and also due to their higher level of experience in dairy farm management.

Skill developed

The gain in the skill level of the respondents towards value addition of milk and detection of heat symptoms was two and above (Table 3), indicating that the learners obtained new skill in these two areas through this course. The others exhibited a score between one and two, implying that the respondents gained skill level which was 'improved over the old skill'. Only a few participants expressed that the course did not provide any skill, probably they had learnt these practices during prior trainings and or through their farm experience.

Jayasubramanian (1996) found that more than one-half (59.50%) of the participants exposed to distance education programme through correspondence course had a knowledge gain of 85.70% as compared to pre-exposure stage. Biswas and Mythili (2004) revealed that nearly two-thirds (62.90%) of the respondents of distance education gained knowledge about concept, methods and various specialized areas of distance education, while two-fifths (40.32%) developed various skills,

like designing and developing self-learning materials, writing tutor comments and evaluating assignment responses.

Economic benefits of the distance education on dairy farming

The economic benefits obtained through increased production in terms of increase in farm size and milk yield of the respondents of dairy farming course are presented in Table 4. It is evident that the respondents who maintained small herd size (<6.07 cattle units) increased their cattle units by 2.06, while medium farmers (between 6.07 to 9.10 cattle units) increased farm size by 3.38 cattle and large farmers (>9.10 cattle units) by 5.66 cattle. The percentage gain in flock size ranged between 59.38 and 75.07. Further, the small farmer respondents gained a daily average milk yield of 1.64 litres, while medium farmers gained a milk yield of 1.69 litres and large farmers 1.47 litres, with the percentage gain ranging between 48.34 and 66.17. That is, the knowledge and skill learnt through the course was reflected by the increase in farm size and daily average milk yield among all categories of the farmers, showing that the learners practiced what they learnt, which provided opportunities for additional income.

The economic benefits obtained through increased sale of milk, dung and animals, and improved net change in value of stock, number of inseminations per conception, mortality percentage, number of animals infected with diseases and number of animals insured are detailed in Table 5. The number of inseminations per conception among the small farmer category had decreased by 0.5, while it was 0.6 and 0.9 among medium and large farmers, respectively. The improvement by reduction in number of animals infected by diseases was three, two and nine, respectively, in small, medium and large farmers. However, benefit in terms of reduced mortality was only negligible. But, the learners started insuring their animals after the course. The respondents in small farmer category gained an additional income of Rs.24,637.50 per annum through sale of milk, while medium and large farmers gained Rs.28,554.23 and Rs.53,029.29 per annum, respectively. The per cent gain ranged from 73.38 (medium farmer) to 122.26 (small farmer). The increase in net income per household per annum through sale of dung was found to be Rs.856, Rs.1,353.85 and Rs.2,262.86 in small, medium and large farmers, with the per cent gain ranging between 59.46 and 75.00.

The incremental net income obtained through sale of animals per household per annum was Rs.734.48 (135.67% gain), Rs.1042.85 (31.47% gain) and Rs.1189.66 (48.94% gain) in small, medium and large farmer categories, respectively. Further, the net change in the value of stock increased by Rs.40,100 (155.79% gain), Rs.71,076.92 (138.74% gain) and Rs.1,11,957.14. (164.92% gain) in small, medium and large farmer categories, respectively. In all, there was a remarkable economic gain earned by the learners of dairy farming course, both in terms of absolute value and percentage gain.

These results were further subjected to statistical analysis to find out the effectiveness of distance education programmes with regard to economic benefits. Paired 't' test was used to find whether there was any significant gain in production and income from pre-enrolment to post-certification stage due to the knowledge and skill gained through course and applied. The results of the test are given in Table 6.

There was a highly significant gain in production and income in all categories of farmers with respect to farm size, milk yield, sale of milk, dung and animals and net change in the

value of stock. However, the gain earned in other attributes - number of inseminations / per conception, percentage of mortality, number of animals infected with disease and number of animals insured was not significant.

Conclusions

The study revealed that the learners of distance education could translate knowledge into practice which resulted in production and productivity gain in dairy farming. The benefits accrued by the learners of the dairy farming distance course in terms of knowledge and skill appear to be significant. Also the economic gains were found to be highly significant statistically. It implies that entrepreneurs and newcomers who like to venture livestock farming can learn effectively through enrolling in such courses.

References

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Table 1: Distribution of respondents in dairy farming course

Year	No. of candidates enrolled	No. completed	No. selected for the study
2000-2001	98	47	21
2001-2002	80	48	22
2002-2003	111	64	29
2003-2004	61	28	13
2004-2005	61	34	15
Total	411	221	100

Table 2: Knowledge gained by the respondents of dairy farming course

Course contents	Pre-enrolment	Post-certification	Knowledge gain	Per cent knowledge gain
Credit / insurance	7	200	193	96.50
Housing	14	300	286	95.33
Farm economics	38	289	251	83.67
Clean milk production	49	297	248	82.67
Calf rearing	49	294	245	81.67
Feed and feeding	55	296	241	80.33
Disease control	86	182	96	48.00
Breeding	106	180	74	37.00
Selection of breeds	178	271	93	31.00

Table 3: Skill developed by the respondents of dairy farming course

Contents for skill development	Obtained new and improved over old skill	Obtained new skill	Improved over old skill	Did not provide any skill	Total weightage score	Mean score
Value addition of milk	17 (56)	65 (130)	18 (18)	-	204	2.04
Detection of heat symptoms	5 (15)	11 (22)	82 (164)	2 (0)	201	2.01
Preparing projects for bank loan	4 (12)	87 (174)	9 (9)	-	195	1.95
Feed formulation	10 (30)	76 (152)	12 (12)	2 (0)	194	1.94
Preparation of dairy economics	8 (24)	76 (152)	16 (16)	-	192	1.92
Dehorning in calves	6 (18)	80 (160)	14(14)	-	194	1.92
Cutting of umbilical cord and ligature in calves	4 (12)	80 (160)	13 (13)	3 (0)	185	1.85
Identification of the age	10 (30)	63 (126)	27 (27)	-	183	1.83
Milking methods	5 (15)	30 (60)	64 (64)	1 (0)	139	1.39
Selection of dairy cow	4 (12)	5 (10)	80 (80)	11 (0)	102	1.02

Table 4: Economic benefits through increased production

Variables / Type of farmer	Pre-enrolment	Post-certification	Gain
Average farm size (in cattle units)			
Small (<6.07)	2.750	4.808	2.06 (74.91)
Medium (6.07-9.10)	5.692	9.077	3.38 (59.38)
Large (> 9.10)	7.540	13.200	5.66 (75.07)
Daily average milk yield (in litres)			
Small farmers	2.471	4.106	1.64 (66.17)
Medium farmers	3.000	4.692	1.69 (56.40)
Large farmers	3.043	4.514	1.47 (48.34)

Table 5: Economic benefits of the distance education on dairy farming

Variables / Type of farmer	Pre-enrolment	Post-certification	Gain
Average number of inseminations / conception			
Small	2.5	2.0	0.5 (20.00)
Medium	2.4	1.8	0.6 (25.00)
Large	2.6	1.7	0.9 (34.62)
Average number of animals infected with diseases			
Small	15	12	3 (20.00)
Medium	7	5	2 (28.57)
Large	18	9	9 (50.00)
Average mortality in percentage			
Small	0	0	0
Medium	0.03	0.02	0.01 (33.33)
Large	0.03	0.02	0.01 (33.33)
Average number of animals insured			
Small	0	2	2 (200.00)
Medium	0	6	6 (600.00)
Large	0	15	15 (1500.00)
Sale of milk (in rupees)			
Small	20152.21	44789.71	24637.50 (122.26)
Medium	38914.62	67468.85	28554.23 (73.38)
Large	48618.00	101647.29	53029.29 (109.07)
Sale of dung (in rupees)			
Small	1144.00	2000.00	856.00 (74.83)
Medium	2276.92	3630.77	1353.85 (59.46)
Large	3017.14	5280.00	2262.86 (75.00)
Sale of animals (in rupees)			
Small	541.38	1275.86	734.48 (135.67)
Medium	3314.29	4357.14	1042.85 (31.47)
Large	2431.03	3620.69	1189.66 (48.94)
Net change in value of available stock (in rupees)			
Small	25740.00	65840.00	40100.00 (155.79)
Medium	51230.77	122307.69	71076.92 (138.74)
Large	67885.71	179842.86	111957.14 (164.92)

Table 6: Effectiveness of distance education programme in terms of economic benefits obtained by the respondents

Variables	Mean Gain			't' Value		
	Small farmers	Medium farmers	Large farmers	Small farmers	Medium farmers	Large farmers
Farm size (in cattle units)	2.06	3.38	5.66	9.92**	12.70**	5.22**
Average milk yield (in litres)	1.64	1.69	1.48	9.13**	9.68**	12.32**
Sale of milk (in Rs.)	24637.50	28554.23	53029.29	11.28**	10.82**	5.67**
Sale of dung (in Rs.)	856.00	1353.85	2262.86	9.92**	12.70**	5.22**
Sale of animals (in Rs.)	734.48	1042.86	1189.66	8.50**	3.63**	4.52**
Net change in the value of available stock (in Rs.)	40,100.00	71076.92	111957.14	14.56**	14.36**	6.87**