

Research Application Summary

Information access and rating of delivery pathways by smallholder dairy farmers in Central Kenya

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Abstract

A cross-sectional survey was carried out using a researcher administered structured questionnaire involving 344 smallholder dairy households in Limuru and Nyandarua South Districts in Central Kenya. The objective of the study was to establish information access and preferences in delivery pathways by smallholder dairy farmers. Information collected were number of information providers, number of dairy topics accessed, information pathways used and farmers' preference of the pathways in dissemination. Data were subjected to descriptive statistics and analysed using analysis of variance. Pair-wise comparison was applied to establish degree of difference in preference. Results show that local language radio stations were most accessible providers. In peri-urban Limuru, milk co-operative societies and government extension were the main sources of information while in rural South Kinangop, local language radio stations, Agricultural training centres and other progressive farmers were the main information providers. T-test indicated significant difference ($p < 0.05$) in rating of all the four information pathways. Direct contact pathway was most preferred and was not significantly ($p < 0.05$) influenced by any of the socio-economic factors investigated. Education level of the farmers significantly influenced the number of dairy topics accessed and significant differences established between farmers with non-formal education compared to adult literacy, primary, secondary and tertiary training. The study recommends that information targeting and packaging should consider gender concerns, education level in the dairy farming system paying special attention to farmers with no formal education. Extension should use local language radio in sensitisation and dissemination of new dairy technologies. This should be complemented by direct contact in field days, farmer field schools and use of progressive farmers to train their contemporaries.

Key words: Information pathway, pairwise comparison, preference, smallholder dairy farmers

Résumé

Une enquête d'échantillonnage a été réalisée à l'aide d'un questionnaire structuré administré par le chercheur impliquant 344 ménages de petits exploitants des laiteries à Limuru et Nyandarua dans les districts du Sud au centre du Kenya. L'objectif de l'étude était d'établir l'accès aux informations et les préférences dans les voies de livraison par les petits producteurs laitiers. Les informations recueillies étaient le nombre de fournisseurs d'information, le nombre de sujets laitiers disponibles, des voies des informations utilisées et la préférence des agriculteurs dans les voies de diffusion. Les données ont été soumises à des statistiques descriptives et analysées en utilisant une analyse de variance. La comparaison par paire a été appliquée pour établir le degré de différence dans la préférence. Les résultats montrent que les stations radio en langues locales étaient des fournisseurs les plus accessibles. Dans les zones périurbaines de Limuru, les sociétés coopératives laitières et la vulgarisation par le gouvernement ont été les principales sources d'information tandis que dans les régions rurales du Sud de Kinangop, les stations radio en langues locales, les centres de formation agricole et d'autres agriculteurs progressistes ont été les principaux fournisseurs d'information. Le test-T a indiqué une différence significative ($p < 0,05$) dans l'estimation de toutes les quatre voies d'information. La voie de contact direct était la plus préférée et n'était significativement ($p < 0,05$) influencée par aucun des facteurs socio-économiques étudiés. Le niveau d'instruction des agriculteurs a fortement influencé le nombre de sujets laitiers disponibles et des différences significatives établies entre les agriculteurs avec l'éducation non formelle par rapport à l'alphabétisation des adultes, primaires, secondaires et tertiaires de formation. L'étude recommande que le ciblage et le conditionnement des informations doivent tenir compte des questions de genre, du niveau d'éducation dans le système de production laitière en accordant une attention particulière aux agriculteurs qui n'ont aucune éducation formelle. La vulgarisation doit utiliser la radio en langue locale dans la sensibilisation et la diffusion de technologies laitières nouvelles. Cela devrait être complété par le contact direct dans les jours du terrain, les écoles pratiques d'agriculture et l'utilisation des agriculteurs progressistes pour former leurs contemporains.

Mots clés: voie de l'information, comparaison par paire, préférence, petits producteurs laitiers

Background

Dairy cattle farming in Central Kenya is constrained by poor nutrition, inappropriate cattle genotypes, livestock diseases, lack of credit to farmers and more importantly, inadequate information access to address these constraints (Staal *et al.*, 1997). One of the factors attributed to this low production is farmer's insufficient access to technical information, for example animal nutrition. Inappropriate nutrition during the dry season leads to low milk production and reduces dairy farmer's income. In 2004, the Government of Kenya prepared a strategy for revitalising agriculture (SRA). This strategy targeted improving extension services, improving linkages between research, extension and farmers and improving access to financial services and credit (SRA, 2004) in a liberalised economy. Liberalisation has created opportunity for entrance of many players in service delivery in the dairy subsector, including information delivery. Information dissemination approaches vary from one information provider to the other. Similarly, farmer preference in information dissemination pathways and media is important in determining adoption of technologies and productivity in peri-urban and rural farming systems. This study was set up to establish information access and preferences in delivery pathways by smallholder dairy farmers.

Literature Summary

In livestock production and marketing, research findings by Mburu *et al.*, (2012) show that men were more exposed to greater and varied topics than women. In Iran, Rezvanfar *et al.* (2007) has shown that most of the farm women in dairy enterprises depend on the friends, husband, neighbours and other sources like local leaders and educated people for their information needs. The speed of uptake of the technology depends on the information pathway used. Farmers using Push-Pull technology in control of Striga weed control, showed preference for information pathways that allow interactive information sharing and learning such as field days and farmer teachers.

Study Description

The study involved a cross-sectional survey using a researcher administered structured questionnaire with 344 smallholder dairy households in Limuru and Nyandarua South Districts in central Kenya. In each division, 3 locations were taken as the sampling frames. The study used systematic and purposeful sampling procedure where transects were drawn in each location and every 5th household on either side of the road visited. The most senior member of the household was interviewed. Where none of the most senior member of the household was present, or

the household did not have dairy cattle, then the next household was picked. Information collected were number of information providers, number of dairy topics accessed, information pathways used and preference factors in information dissemination. Data analysis used descriptive statistics and analysis of variance using GLM procedures for SAS. Pairwise comparison was used to establish the level of significant differences in preference factors. The analytical model for SAS for number of information providers and number of dairy topics accessed was:

$$N_{ijklm} = \mu + D_i + G_j + A_k + E_l + (G*A)_{jk} + (G*E)_{jl} + \ddot{e}_{ijklm}$$

Where;

N_{ijklm} = number of information providers accessed (or number of topics accessed)

μ = mean

D_i = Division

G_j = Gender of farmer

A_k = Age group of the farmer

E_l = Education level of the farmer

$G*A_{jk}$ = Gender and age group interaction

$G*E_{jl}$ = Gender and education level interaction

\ddot{e}_{ijklm} = error term

Research Application

The mean number of information providers per household was two. The number of information providers was not significantly ($P=0.05$) different between the two study sites, between gender, age group, education level, gender and age group and also gender and education level. Main information providers were local language radio stations, dairy co-operative societies, government extension, artificial insemination (AI) practitioners and other progressive farmers (Table 1).

Table 1. Main information providers in Limuru and South Kinangop Divisions.

Provider	Per cent access in Limuru	Per cent access in South Kinangop
Local language radio	66.7	83.6
Dairy co-operative societies	63	4
Government extension	33	11.7
Progressive farmers	18.5	4.8
Farmers training centres	0.0	21
AI practitioners	15.9	10.7
Local agrovets	0.0	13.5
Neighbours	1.6	6.8

The mean number of topics accessed was four. The number of dairy topics taught was significantly ($p < 0.05$) affected by the farmer level of education but not affected by gender, age group or division (Table 2).

Results of the t- test and pairwise comparison of farmer education level revealed significant differences in rating of number of topics accessed (Table 3).

Preference for information pathways. Direct contact was the most preferred pathway (Table 4) with both peri-urban (68%) and rural smallholder (72%) dairy farmers. Farmers attributed this preference to provision of dialogue and demonstration indicating importance attached by farmers to verbal interaction.

Table 2. Factors influencing number of information topics accessed by smallholder dairy farmers in South Kinangop and Limuru Divisions.

Source of variation	DF	Mean square	F value	Pr>F
Division	1	5.29704515	1.96	0.1625
Gender	1	5.80304872	2.15	0.1439
Age group	5	1.10166762	0.41	0.8435
Education level	4	13.62077021	5.04	0.0006 _a
Gender and age group	5	0.29551782	0.11	0.9902
Gender and education level	4	4.08734446	1.51	0.1984

Figures with subscript are significant.

Table 3. Pair wise comparison of farmer level of education and number of topics accessed.

Farmers education level pair comparison	Difference between means	95% confidence limits		Remarks
		lower limit	upper limit	
Tertiary and secondary	0.1275	-0.6477	0.9026	NS
Tertiary and primary	0.8895	-0.1411	1.6380	***
Tertiary and non-formal	1.5606	0.7027	2.4186	***
Tertiary and Adult literacy	0.0833	-1.2606	1.4273	NS
Secondary and primary	0.7621	0.3565	1.1677	***
Secondary and non-formal	1.4332	0.8497	2.0166	***
Secondary and adult literacy	-0.0441	-1.2318	1.1435	NS
Primary and non-formal	0.6711	0.1236	1.2185	***
Primary and adult literacy	-0.8062	-1.9766	0.3642	NS
Non-formal and adult literacy	-1.4773	-2.7206	-0.2340	***

*** indicates significance at 0.05 level, NS – Not Significant.

Table 4. Information media preference in Limuru and S. Kinangop divisions.

Division	Print media		Mass media		Electronic media		Direct contact	
	No.	%	No.	%	No.	%	No.	%
Limuru	10	16	7	11	3	5	43	68
S.Kinangop	37	13	26	9	16	6	202	72
Total	47	14	33	10	19	6	245	71

Source: Survey data (2010).

Table 5. T-test for the rating of information pathways.

t-group	Mean	N	Pathway
A	4.50	344	Direct contact
B	3.40	344	Mass media
C	2.88	344	Print media
D	2.06	344	Electronic media

Source: Survey data (2010).

All the four t-groups had different letters indicating significant differences.

T-test comparison of the four information pathways investigated with critical value of $t=1.96$ and LSD 0.16, indicated significant differences in all of them (Table 5).

This study established that the most accessed information providers were local language radio, dairy co-operatives, government extension and progressive farmers. Direct contact was the most preferred information delivery pathway regardless of age, education, gender and division. It recommends information targeting and packaging considering gender concerns, education level in the dairy farming system paying special attention to farmers with no formal education. Extension should use local language radio in sensitisation and dissemination of new dairy technologies. This should be complemented by direct contact in field days, farmer field schools and use of progressive farmers to train their contemporaries.

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