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The role of personal information sources on the decision-making process of Costa Rican dairy farmers

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Abstract

The attitudes of farmers in relation to the importance of different people as information and opinion sources (InfS) for different phases of the decision-making process were studied in 91 Costa Rican dairy farmers. The InfS studied were: *Family members*, *Other farmers*, *Technical advisors*, *Farm staff* and *Commercial agents*, while the phases were: Problem detection, Seeking for problem solutions, Seeking for new practices and Seeking for opinion. A Multidimensional Preference Analysis (MDPREF) was used to obtain a two-dimensional map of preference of the farmers. A factor analysis was used to define new variables representing the farmers' predilection towards the InfS. A canonical correlation analysis was performed to find-out simple and canonical correlation between farmers'/farms' characteristics and the InfS preferences. Informational profiles in the population were defined through a Cluster Analysis. The MDPREF suggests that *Family members* and *Technical advisors* were the most preferred InfS. However their relative importance changed throughout the phases. *Farm staff* were rated in third place and their role became more important in the 'Problem detection' phase. *Other farmers* and *Commercial agents* were, in general, the less preferred information sources. The former became slightly more important in the 'Seeking for new practices' phase. The canonical correlation analysis found three low-medium correlations between the farmers'/farms' characteristics and the InfS factors. These correlations showed that the farmers' age, educational level and dedication and the farms' characteristics of area, herd size and distance to population centres had significant influence on the preference of the farmers towards different information sources. The cluster analysis found nine groups of similar farmers according to their preferences towards informational sources. Some implications mainly for extension activities are also stated and discussed. The importance of different informational sources

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slightly change throughout the decision-making steps, the family and farm staff being the most preferred information sources.
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1. Introduction

Information is input required in every step of the decision-making process, i.e. goal formulation, problem recognition, problem formulation (identifying the causes of the problems), pre-selection of alternative actions, and in more general terms in uncertainty reduction (Timko and Loyns, 1989; Ohlmer, 1992).

Information becomes available to the decision-maker through different media, origins and sources. According to Errington (1986), information sources could be classified according to their origin: internal and external; according to their media: direct observation, verbal or written and according to their sources: recorded numerical data, comments from people and the decision-maker's own past experience. "Trusted People", "Significant Others", and "Information digestors" (Gasson, 1973; Errington, 1986; Ferreira, 1997) are concepts used to describe groups of people who are close to the farmers and are sources of opinion, information and knowledge, and that have an active role in the decision-making process. People belonging to these groups could be members of the decision-maker's family, other farmers, members of the farm staff or professional advisers, etc. (Gasson, 1971).

Some examples of empirical findings regarding to the role and importance of different media and sources of information are available in the literature. In a large sample on four states of the United States, Ford and Babb (1989) demonstrated that farmers prefer the personal and service-oriented media rather than written information. In Scotland Sutherland et al. (1996) provides evidence of why farmers prefer this media. They found that for the farmers, written information is often late in relation to other sources of information and of little use because it is written in general terms and is perceived as inaccurate. In terms of personal media, there are some contrasting findings showing the relative importance of different personal information sources used by farmers in decision-making. Sutherland et al. (1996) also found that other farmers and agricultural advisors and consultants were the most important information sources for assistance and reference figures. Important findings of this research were that self-reporting performance from other farmers was distrusted; while monitoring them was perceived as of great interest. On the other hand, they trusted non-family agents (advisors) because of their objectiveness and independence. Ford and Babb (1989) found that in terms of crop decisions (with few differences for livestock) family and friends were the most important information sources. However other farmers, private firms and extension services were also used for these purposes. Blum (1989) in Israel, found that for awareness of innovation and implementation, the importance of family and extension advisors were very

important. Nevertheless, for the former step, the two information sources were equally important whilst for the latter the extension adviser became more influential.

In terms of sources of opinion, the evidence shows that the family is of primary importance in planning decisions and in large financial and strategic decisions (Henderson and Gomes, 1982; Sutherland et al., 1996). The important role of the extension worker, as opinion source in planning and decision-making is also documented by Sutherland et al. (1996).

In summary, personal sources of information are the most preferred by farmers. On the other hand, family members and extensionists/advisors are the most used information sources and therefore conform the basis of the Trusted People group.

Unless more efforts are placed on the study of the relative importance and the dynamics of the information flows and its sources, suitable mechanisms for promoting technology transfer and training are unlikely to be found. These improved mechanisms could help to increase the rates of adoption of new practices at farm level thus producing an impact on agricultural development. In spite of the evidence available, some questions remain and need to be answered in order to achieve this goal: 1—What is the relative importance of different Trusted People in different phases of the decision-making process?; 2—Which are the farmers'/farms' factors affecting the preponderance of some personal information sources over others?; 3—How does the farmers' population naturally divides and how can it be classified?. This work is an attempt to provide empirical evidence and methodologies that could lead to answering these questions for improving dissemination and technology transfer to the farm household.

2. Materials and methods

Fig. 1 summarises the methodology used to analyse the information.

2.1. Sample

The sample selection was described in detail by Solano et al. (2001).

2.2. Measuring attitudes towards the personal information sources

The attitudes of farmers towards different categories of information sources (InfS) for different decision-making phases were measured using a Simple Rating Scale technique (Foddy, 1993). The InfS categories were: *Family members*, *Other farmers*, *Farm staff*, *Technical advisors* and *Commercial agents* while the decision-making phases were: Problem Detection, Seeking for problem solutions, Seeking for new practices and Seeking for opinion. Five cards written with each InfS category were given to the farmers and they were asked to rate them in a rule scale from 1 to 5 (1 meaning not important and 5 meaning very important). Explanations of the meaning of the card, the scale and the phases of decision-making were given before the exercise started. This exercise was repeated four times, one for each decision-making

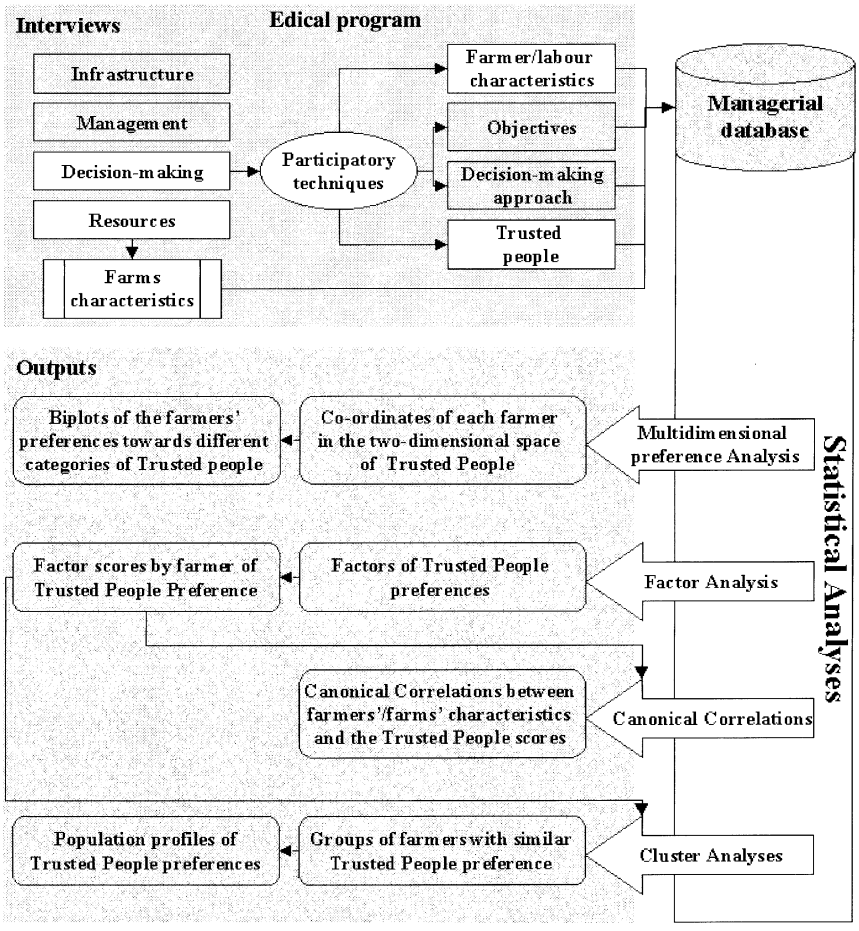

Fig. 1. Diagram of the methodology of analysis.

phase. The rates given to each InfS throughout the phases were simultaneously entered into the Edical Program (Solano et al., 2001).

2.3. Statistical analyses

2.3.1. Multidimensional preference analysis

This analysis was developed by Carroll (1972) and is a principal components analysis of a data matrix with columns that correspond to people and rows that correspond to objects. The data are ratings or rankings of each person's preference towards each object (SAS, 1994). In this case, people were the farmers and the objects were the InfS categories. In order to present the database adequately, the first step of the analysis was to transpose the data so that InfS became rows and farmers' became columns (the opposite of a traditional multivariate matrix). The

second step was a prinqual analysis (principal components analysis of qualitative data) (SAS, 1994) that attempted to optimise the data correlation matrix to the first two principal components using a monotonic optimal transformation. The analysis produced biplots (plots that show the relationships between the rows and the columns of a data matrix) whose axis were defined by the factors and represented the farmers' preference space. Using these plots, it was possible to identify clusters of farmers points near to InfS points, or clusters of InfS points, showing farmers with similar preferences towards the same InfS categories or InfS with similar preference among the farmers. Four biplots, one for each phase of the decision-making steps were produced.

2.3.2. Relationships between farmers'/farms' characteristics and the personal information sources used

Using the original database (farmers were rows and InfS were columns), a Factor analysis using the Principal Components method was used to identify factors that represented the relationships among the InfS preferences. A Varimax orthogonal rotation was used to facilitate the interpretation of these relationships. This analysis produced factor scores by farmer as new variables that represented the farmer' preference towards the InfS categories. Once these factors were calculated, a Canonical Correlation Analysis (CCA) was performed to identify relationships between the farmers'/farms' characteristics i.e. age, level of dedication to farming, educational level, pasture area and the number of milking cows with the preference factors scores. This analysis produced both simple and canonical correlation matrixes.

2.3.3. Defining the farmers' Trusted People Profiles in the population

Using the farmer's scores for each factor, a cluster analysis (CLU) was used to define groups of farmers with similar InfS preferences and for defining the population profiles (Informational Profiles). The Ward clustering method was used to calculate the Euclidean distances among the groups. The final number of groups was defined by looking for a consensus of four statistics: high determination coefficient (r^2), a peak in the cubic clustering criterion (CCC) and pseudo F statistic (PsF) and a small value of pseudo T statistic (PsT) (SAS, 1994). In order to interpret the profiles of farmers within each group, the means and confidence intervals (90%) of the original rates for each InfS categories within each group were calculated. A series of labels were assigned according to the groups' traits in order describe the Trusted People Profiles of each group.

3. Results and discussion

3.1. Multidimensional preference analyses

Observing the biplots it could be said that most of the farmers generally preferred both the *Technical advisors* and *Family members* as information sources regardless of the step of the decision-making process analysed. The importance of the other InfS

categories slightly changed throughout the steps. Analysing each phase separately, it could be seen that for 'Problem Detection' (Fig. 2) Dimension 1 represented the preference from *Technical advisors* to *Commercial agents* while Dimension 2 represented the preference from *Commercial agents* to *Family members*. It was apparent that the majority of farmers preferred the *Family members* since there was a large cluster of farmers very near to this category in the right-lower quarter. In the top-left quarter there is a group of farmers who preferred the *Technical advisors* and they were slightly in favour of the *Farm staff*. The *Farm staff* obtained its higher level importance in this step of the decision-making process. A large proportion of farmers preferred both *Family members*, *Technical advisors* and *Farm staff* (Top-right quarter) and just two farmers preferred *Other farmers* or *Commercial agents* for 'Problem Detection'.

A very similar pattern was seen for 'Seeking for problem solutions' (Fig. 3). However, it was evident that the preference towards the *Technical advisors* increased because of the high frequency of farmers around this category and the reduction in the frequencies around the *Family members*. In this step the role of the *Farm staff* category seems to be reduced. No significant changes (not statistically proved) in preference were observed towards *Other farmers* and *Commercial agents*.

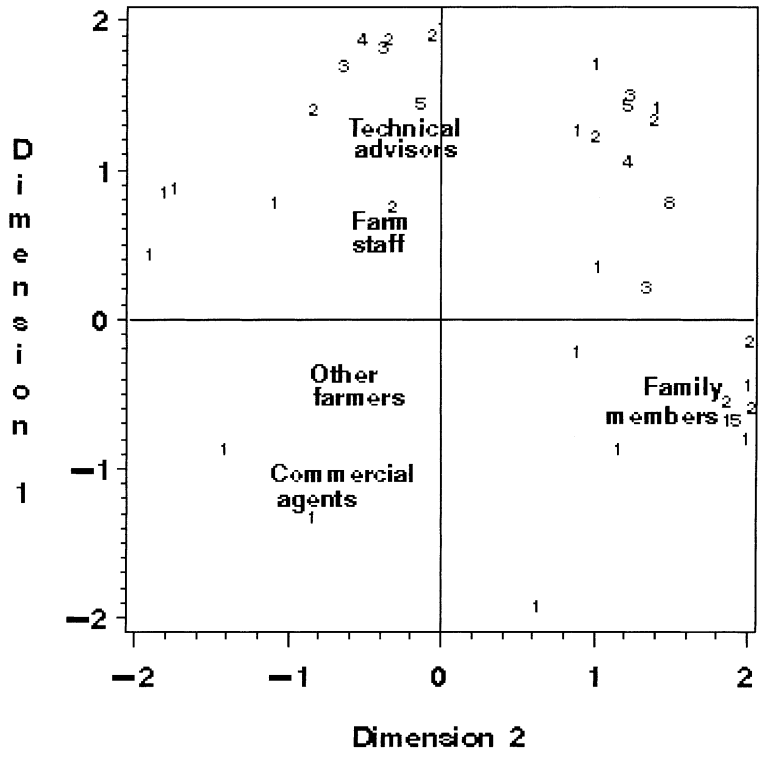

Fig. 2. Biplot of the Multidimensional Preference Analysis of the personal information sources for 'Problem detection' (numbers inside represent frequencies of farmers).

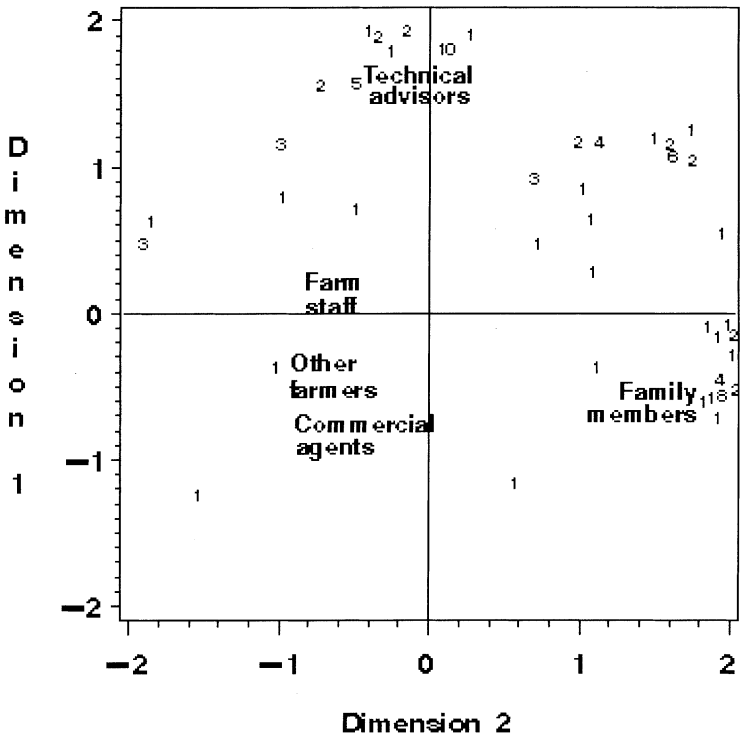

Fig. 3. Biplot of the Multidimensional Preference Analysis of the personal information sources for 'Seeking for problem solutions' (numbers inside represent frequencies of farmers).

Fig. 4 shows that for 'Seeking for New Practices', Dimension 1 represented the preference from *Commercial agents* to *Family members* while Dimension 2 represented the preference from *Farm staff* to *Technical advisors*. It can be seen that the preference of the farmers in this phase changed significantly in favour of the *Technical advisors* and that the importance of the *Family members* was reduced. On the other hand, the preference towards the *Commercial agents* became more important as judged by the farmer frequency near to this category. It was in this phase where this InfS category obtained its highest preference among the farmers. A low preference was observed for the *Other farmers* and *Farm staff*.

Finally Fig. 5 demonstrates that for 'Seeking for Opinion', no farmer seemed to prefer other InfS than *Technical advisors* and *Family members*. The frequency of farmers around the *Family members* point indicated the high level of importance of the *Family members* as opinion sources. On the other hand, a small proportion of farmers laid near to the *Technical advisors* category showing their limited importance as primary opinion source. The frequencies of farmers in the top-right quarter indicated that a significant proportion of the farmers also preferred a combination of *Family members* and *Technical advisors* as personal information sources.

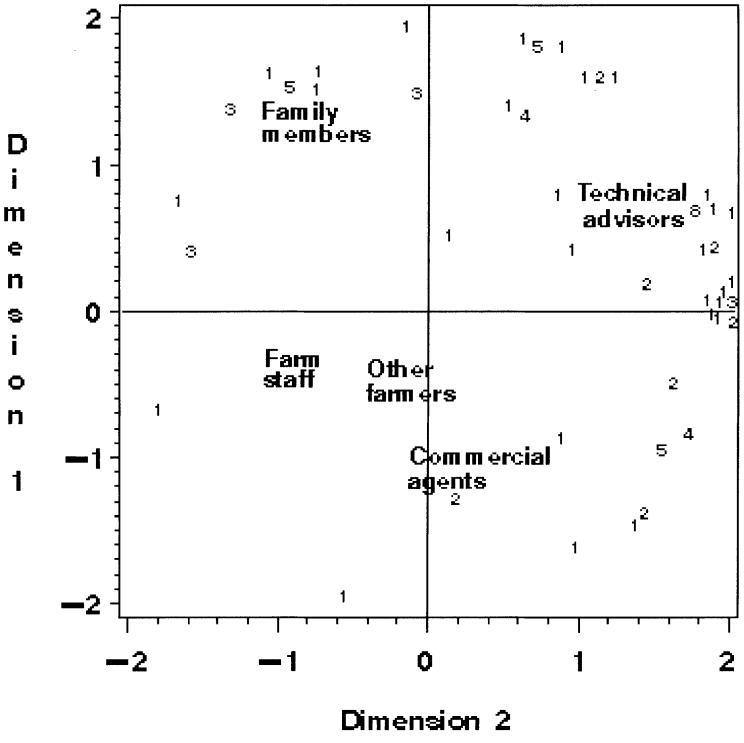

Fig. 4. Biplot of the Multidimensional Preference Analysis of the personal information sources for 'Seeking of new practices' (numbers inside represent frequencies of farmers).

These results show that personal information sources for Costa Rican dairy farmers are a combination of *Technical advisors* and *Family members* and that their relative importance changes throughout the phases of the decision-making process. This is in agreement with the study reported by Sutherland et al. (1996) and Blum (1989) with respect to the importance of these two categories of personal information sources in several activities of the decision-making process. On the other hand, this is in agreement with the findings of Ford and Babb (1989) regarding to the importance of the *Family members* but disagrees with respect to the limited importance of the *Technical advisors* reported by them.

The fact that a relative importance of the InfS categories was observed throughout the phases, is evidence that the farmers were able understand the dynamics of the rating exercise and that they understood the differences among phases of the decision-making process.

The privileged position of the *Technical advisors* and *Family members* demonstrated their strategic role in technology transfer, extension and training activities. On the other hand, it also demonstrated the necessity of redefinition of the extension strategies in such a way that the most preferred categories of information sources become other targets and not only the farmers. This also applies to the *Farm staff*

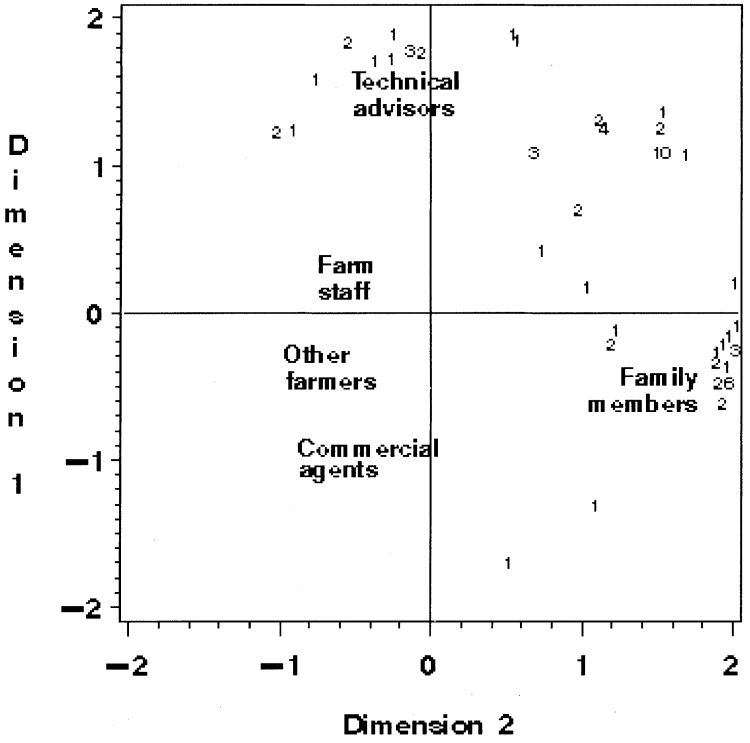

Fig. 5. Biplot of the Multidimensional Preference Analysis of the personal information sources for 'Seeking for opinion' (numbers inside represent frequencies of farmers).

since their role is quite important during the 'Problem detection' phase. Well trained *Farm staff* in 'Problem detection' could have a substantial impact on the whole process and therefore on the development of the farms.

3.2. Relationships between farmers'/farms' characteristics and the personal information sources used

The factor analysis found that five factors explained around 70% of the original variance and that each factor represented the preference towards each InfS category in all the steps studied. Fat1, Fat2, Fat3, Fat4 and Fat5 represented the preference towards *Family members*, *Other farmers*, *Farm staff*, *Technical advisors* and *Commercial agents,* respectively (Table 1).

The CCA found three medium significant canonical correlations. The interpretation was made looking at the correlations between the original variables and their respective new canonical variables (CCVs and FCVs) and then studying the relationships between them (Table 2).

The first canonical correlation showed that as the age and the level of dedication to farming decreased and as the dimension of the farm and the educational level of

Table 1
Rotated factor patterns for the personal information sources

Activity	Personal information sources	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Problem detection	Family members	0.86605	0.06361	0.00532	−0.19060	−0.05549
	Other farmers	0.10056	0.85072	0.12122	0.07985	0.03259
	Farm staff	−0.08886	0.07445	0.77783	−0.05138	0.18301
	Technical advisors	0.06932	0.11197	−0.03318	0.73390	0.02487
	Commercial agents	0.06109	0.15508	−0.01117	0.17567	0.52193
Problem solution	Family members	0.88560	0.00348	−0.05597	−0.12093	0.09165
	Other farmers	−0.03128	0.84775	0.05793	0.15618	0.18847
	Farm staff	−0.12006	0.15958	0.85021	0.00206	0.15391
	Technical advisors	−0.32185	0.17052	0.11009	0.75636	0.09299
	Commercial agents	0.08472	−0.02868	0.26931	0.12333	0.75386
New practices	Family members	0.87281	−0.06451	0.12363	0.01652	−0.13342
	Other farmers	0.01718	0.83652	0.11479	0.06760	0.06447
	Farm staff	0.26010	0.02668	0.81417	0.01892	−0.05165
	Technical advisors	−0.21906	0.10356	−0.02830	0.79679	0.06649
	Commercial agents	−0.12649	0.10378	0.05840	−0.06101	0.85368
Opinion sources	Family members	0.79340	0.05186	0.03118	−0.14716	0.23194
	Other farmers	−0.04207	0.78810	0.08956	0.16514	0.07778
	Farm staff	0.06550	0.14127	0.81928	0.13939	0.08597
	Technical advisors	−0.12919	0.08232	0.06737	0.83398	0.17505
	Commercial agents	0.23597	0.20429	0.22235	0.38749	0.47477
Statistics	Eigenvalue	4.6817	3.6618	2.2626	1.8647	1.4801
	Difference	1.0198	1.3992	0.3979	0.3846	0.5853
	Proportion	0.2341	0.1831	0.1131	0.0932	0.0740
	Cumulative	0.2341	0.4172	0.5303	0.6235	0.6976

the farmer increased, the role of the family was less important, while the role of the *Farm staff* and *Technical advisors* became more relevant. This could be explained by the fact that young farmers tend to have a higher educational level and are likely to be professionals. Therefore their dedication to farming is lower because they are involved in other economic and social activities as well. These facts can produce three effects: 1—The family does not live at the farm as a consequence of the other economic activities, they live probably in cities; 2—the farmers disassociate the family with the farm due to the educational level; 3—the size of the farm in terms of area and herd size increases the necessity of people with managerial skills; increases the amount of information required to make decisions and increases the technical requirement of the farm. All these factors together increase the role of the *Farm staff* and the *Technical advisors* in the decision-making process. Other explanations could be: larger farms are more able to pay *Technical advisors*; farmers managing larger farms require a more entrepreneurial behaviour and that well-educated people tend to trust in other well-educated people such as the *Technical advisors*. Finally, taking into account the size of the farm and the level of dedication of the farmer, the

Table 2
Correlation matrixes of farmers'/farms' characteristics and Fats with their respective canonical variables

Canonical variables of farmers'/farms' characteristics			
	CCV1	CCV2	CCV3
Distance	−0.0212	0.6837	0.1319
Age	−0.3104	0.2424	−0.1997
Dedication	−0.4066	0.6104	−0.2501
# Cows	0.5237	0.3344	0.2715
Pasture area	0.3513	0.4661	0.6488
Education	0.9112	−0.0422	−0.3489
Canonical variables of fats			
	FCV1	FCV2	FCV3
Fat1	−0.7230	0.6597	−0.1631
Fat2	0.2650	0.3984	−0.1734
Fat3	0.4125	0.5658	0.5577
Fat4	0.4828	0.2907	−0.5516
Fat5	−0.0622	0.0375	0.5728
Correlation	0.5621	0.5303	0.3596
Pr > F	0.0001	0.0011	0.1137
PredP	0.0632	0.1194	0.1453

PredP is the variance of FCVs explained by CCVs (prediction power).

increment in the importance of the *Farm staff* and *Technical advisors* is an effect of the farmers' absence.

The second canonical correlation showed that as the distance of the farm to population centres, the level of dedication to farming and the size of the farm increased, the role of the *Family members*, *Other farmers* and the *Farm staff* increased. In other words, Dedicated farmers in distant and large farms tend to have a Trusted People group composed by *Family members*, *Other farmers* and *Farm staff*. This result shows how the distance from population centres makes farmers to be more dedicated to farming regardless the educational level. These two factors can produce either a reduction in the necessity of *Technical advisors* due to the presence of the farmers in the farm, or make the technical services less available and more expensive due to the distance. On the other hand, this can produce an effect on *Other farmers* as a consequence of the dedication, since visits between farmers could be more frequent due to the presence of the farmer in the farm and the social closeness among them. This, besides the absence of other technical information sources, makes the role of *Other farmers* in the decision-making process become more important. The role of the *Family members* increases in these conditions probably due to a higher dedication level of the *Family members* to farming activities as a consequence of social values and of the low availability and facilities for off-farm, non-agricultural economic activities. The importance of the *Farm staff* could be explained in the same way of the previous correlation, that was a consequence of the increased information requirement in bigger farms.

The third canonical variable showed that the bigger the farm and the less educated the farmer, the more important the *Farm staff* and *Commercial agents* were. Simultaneously the role of the *Technical Advisors* became less important. This provides evidence of the close relationship between the farmers' educational level and the role of *Technical advisors* regardless of the size of the farm and the financial constraints of paying a professional (larger farms can afford this service in comparison to the small ones). On the other hand, it also proves that *Commercial agents* become more important when they are the only technical information source. Another explanation could lay on the marketing strategies, where exchange of technical knowledge in return to product purchasing is a common practice that improves the perception of the farmers in favour to these 'free' information sources.

Finally, the variance explained by the three canonical variables only accounts for 14% demonstrating the low power of prediction of the information sources from studied farmers'/farms' characteristics and provides information of the necessity of identifying other key variables in order to increase this prediction power.

3.3. Defining the farmers' Trusted People profiles in the population

The statistics used to decide the best number of clusters (groups) suggests that, from the point of view of the t^2, there were good points at 3, 5, 7 and 9 groups since this statistic decreased in these points. Pseudo F increased linearly as the number of groups increased, however at the point 10 it decreased. The CCC statistic showed a peak at point 9. The R^2 explained more than 60% from the point 9 upwards. Looking for the consensus between statistics, nine was found to be the best number of clusters to divide to farmers' population according to their information sources preferences.

Fig. 6 shows the arithmetic means of the rates of each of InfS category by cluster. Looking at the number of farmers within each cluster it seems that the analysis produced groups with similar size except groups 7 and 9 which are smaller and therefore they represent farmers with some unique preference arrangements.

Group 1 (tp1) was a group of farmers who do not have any special preference towards any of the information sources categories, except a small tendency in favour of the *Technical advisors*. Therefore, they represent the most individualist farmers because they make all the phases of the decision-making process by themselves. This profile could be labelled as 'Technical advisors Trusters'.

Group 2 (tp2) was a group of farmers who have a strong predilection for the *Family members* as information sources while they do not trust any other InfS category. This profile could be labelled as 'Family trusters'.

Both the *Family members* and the *Technical advisors* are incorporated together within the Trusted People group of the farmers belonging to the Group 3 (tp3) and this profile could be labelled as 'Family and Technical advisors trusters'.

Farmers in Group 4 (tp4), along with the *Family members* and *Technical advisors*, they trust in *Other farmers* as well. Their label could be 'Family, Technical advisors and Other farmers trusters'

Group 5 (tp5) were farmers who are strongly against the role of *Family members* in the process and they were attached to *Other farmers* and more strongly towards

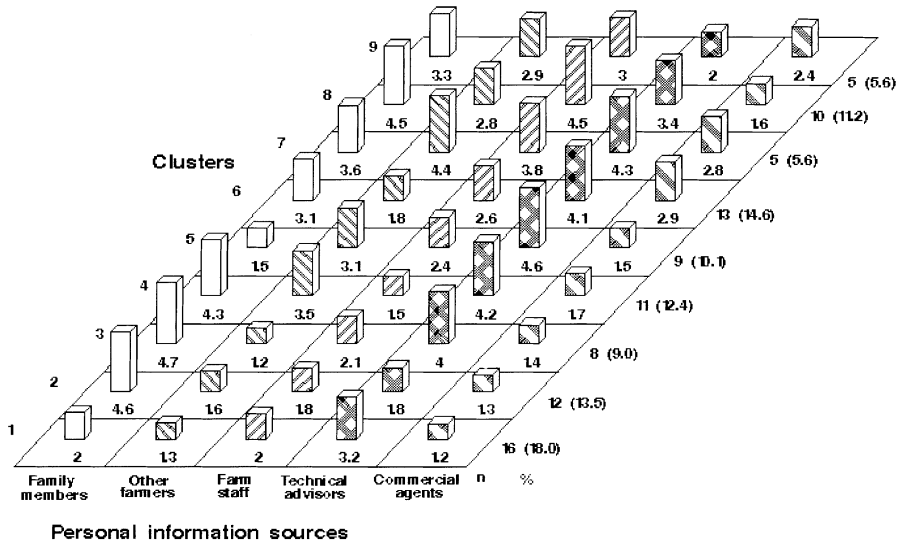

Fig. 6. Arithmetic means of the rates of the personal information sources by each cluster.

the *Technical advisors*. A label as 'Non Family pro Other farmer and Technical advisors trusters' can be assigned to them.

Farmers belonging to Group 6 (tp6) had very similar profile than Group 3 in the sense they trust in *Family members* and *Technical advisors*, however they are the farmers who ranked the *Commercial agents* higher. They could be labelled as 'Family, Technical advisors and Commercial agents trusters'.

Farmers who trust in almost every information sources categories, particularly *Other farmers* and *Technical advisors* composed Group 7 (tp7). Notice that this group in one of the smallest ones in the population. 'Multiple information sources trusters' could be a suitable label for these farmers.

Group 8 (tp8) was related to both *Family members* and *Farm staff*, being the latter the most preferred category. They are slightly in favour of *Technical advisors*. The label 'Family, Farm staff and Technical advisors trusters' was assigned to them.

Finally Group 9 (tp9) was the cluster in which the role of *Technical advisors* was ranked lower and general they were not attached to any InfS category. They were labelled and 'Non-Personal information sources trusters'.

Table 3 summarises the Trusted People Profiles in which the population of Costa Rican dairy farmers can be classified.

These results demonstrated the high variability of personal information preferences throughout the Costa Rican dairy farmers population. This agrees with the findings of Ferreira (1997) in terms of the relative importance of different members of the trusted people group throughout the decision-making units categories. It was also demonstrated that farmers can be satisfactorily separated out into well defined groups representing different Trusted People Profiles.

Table 3
Summary of the Trusted People Profiles in the population

Cluster	*n*	%	Profiles
1	16	18.0	'Technical advisors trusters'
2	12	13.5	'Family trusters'
3	8	9.0	'Family and Technical advisors trusters'
4	11	12.4	'Family, Technical advisors and Other farmers trusters'
5	9	10.1	'Other farmer and Technical advisors trusters'
6	13	14.6	'Family, Technical advisors and Commercial agents trusters
7	5	5.6	''Multiple information sources trusters'
8	10	11.2	'Family, Farm staff and Technical advisors trusters'
9	5	5.6	'Non-personal information trusters

4. Some implications

The implications of these findings are related to extension activities. The profiles defined here can be used as a proxy of the informational flows of the farmers. This is key information to define strategies to make new practices and technologies available to the farmer. These profiles also give information on the level of openness of the farmers and key information to select the best communication strategy to ensure higher adoption levels and reduce the adoption lag. For example, farmers belonging to groups 7 and 8 (Fig. 6) are more likely to be aware of new practices available in the media, since they are very open to different information sources. It means that less effort should be expended in them and more effort should be addressed to farmers belonging to groups 1 and 9, who are very limited in informational sources. The target of the extension activities should be directed to the family in those farmers belonging to group 2, since only they are open to this information source.

It is important to stress that information refers not only to ''awareness of new practices'' or technologies but also to activities such as ''detection of problems in the farm''. Since, for example, the farm staff plays an important role in this activity, special efforts should be made in terms of training them on how to detect problems. The introduction of herd health protocols, for instance, which is a relatively new method of preventing health problem in dairy herds, should be directed not only to the farmer but (perhaps even more importantly) to the farm staff. With respect to the important role of the family members as opinion sources, there is evidence of the need to focus on technical training for them on new practices or technologies. In this way, the opinion from these people will be more informed and probably favour the new practices. A similar approach should be given to the technical advisors. Their influence seems to be very important in ''problem solutions'' and ''awareness of new practices''. They become important information digestors for the extension and research sector to promote, persuade and train farmers and their trusted people to ensure higher level of technology adoption when required. Where private technical advisors exist, and they are the most important, and sometimes the only source of

technical knowledge, these actors should be considered within the domain of the extension activities and training.

The methodology used here, although derived from other disciplines such as marketing, proved to be suitable for studying preferences. It is not surprising since extension activities are also a marketing business with the only difference that the products are technologies and the consumers are farmers.

5. Conclusions

Family members and *Technical advisors* are the most common personal information sources for the majority of Costa Rican dairy farmers regardless of the decision-making steps involved. However, their relative importance changes significantly throughout the phases of the decision-making process.

The role of the *Family members* is more important in 'Problem Detection' and in 'Seeking for Opinion' while the role of the role of the *Technical advisors* is more important in 'Problem Solution' and 'Seeking for new practices'.

The role of other personal information sources slightly changes throughout the decision-making phases where the role of the *Farm staff* and *Commercial agents* becomes more important in 'Problem detection' and 'Seeking for new practices' respectively.

The relative importance of the personal information sources is significantly affected by the farmers' characteristics of age, level of dedication to farming and educational level and for the farms' characteristics of Distance from population centres, numbers of cows and the area of the farm. Nevertheless, the predictive power of these characteristics is low.

Well defined groups of farmers (Trusted People Profiles) exist in the population according to their preference towards different personal information sources. The fact that nine profiles are needed to classify the population is evidence of the high variability in the preferences towards these information sources.

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