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Management priorities of livestock farmers: A ranking system to support advice

S. Mugnier [a], M.A. Magne [b], J.Y. Pailleux [c], S. Poupart [c], S. Ingrand [c,*]

[a] AgroSup Dijon, URANIE, Équipe "Evolution des systèmes d'élevage", F-21079 Dijon Cedex, France
[b] INRA, UMR1248 AGIR, UMR INRA/ENSAT, Équipe ORPHEE, F-31326 Castanet-Tolosan Cedex, France
[c] INRA, UMR1273 METAFORT, Équipe SELECT, F-63122 Saint-Genès-Champanelle, France

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ABSTRACT

This study lies within the research framework of information systems of livestock farmers and examines advice and guidance methods. It aimed to investigate the relative importance farmers give to the different tasks they must accomplish (i.e., "domains"). Surveys were carried out on 24 meat sheep farms and 30 beef cattle farms located in the Massif Central (Limousin and Auvergne regions) of France. Livestock farmers were asked to rank nine domains within each of three criteria: attractiveness, importance and satisfaction. Two domains systematically appeared in the forefront: herd composition and breeding, which form the core of farmers' work. The domains ranked highest and lowest were similar in both sheep and cattle farming. The herd-composition domain was universally accepted by sheep farmers for the attractiveness criterion, demonstrating a specific attachment to raising this species. The major difference between farms of the two livestock species lay in the domains most highly ranked in attractiveness: they are focused on the animal in sheep farming (herd, breeding, feed) and focused on resources in cattle farming (forage, grazing). Technical domains were ranked high in importance (for system persistence). Domain rankings were weakly related to five strategies identified that farmers used to acquire information in managing farm systems. These preferences may enable agricultural advisors to understand better the priorities of the farmers they assist. For example, the domains ranked lowest in satisfaction could constitute advice priorities and provide a way to initiate dialogue with farmers. A variety of advice sources (e.g., written, oral, Internet, individual and collective-based) should be maintained to accommodate the variety of information-acquisition strategies.

1. Introduction

Farm management has become increasingly complex, with the need to encompass economic, technical, ethical, environmental and social aspects, both in countries with highly protective policies (e.g., those in the European Union) and in countries where great risk exists due to prices and climate conditions. As the goals and constraints related to these aspects have evolved greatly over recent years, so has the information environment of farmers. These two parallel trends require that agricultural advisors renew their methods of interaction with farmers (Carberry et al., 2002; Diekmann and Batte, 2009; Faure et al., 2010; Laurent, 2000; Slavik, 2004). The fundamental elements are that funding is becoming less available, farmers' levels of knowledge have increased, and farmers are confronted with an abundance of information from many sources (e.g., newspapers, Internet, other farmers, salesmen, etc.).

Assuming that renewing advising methods implies closely involving farmers in the process (Magne and Ingrand, 2004),

* Corresponding author. Tel.: +33 4 73 62 42 91; fax: +33 4 73 62 41 18.
E-mail addresses: s.mugnier@agrosupdijon.fr (S. Mugnier), marie-angeline.magne@toulouse.inra.fr (M.A. Magne), pailleux@clermont.inra.fr (J.Y. Pailleux), sophie.poupart@gmail.fr (S. Poupart), stephane.ingrand@clermont.inra.fr (S. Ingrand).

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we developed a two-step method to learn about and analyse the management priorities of farmers. The first step assesses farmers' priorities by asking them to rank the different tasks they must accomplish (i.e., "domains" of livestock farmers) according to their attractiveness, satisfaction, and importance (Magne et al., in press). The second step assesses the strategies used to acquire information within each domain. Finally, the method estimates whether the ranking of domains is related to information-acquisition strategies.

In this study we used the method with a sample of beef cattle and meat sheep farmers, as the domains of livestock farmers are assumed to be the same for these two ruminant-production systems. The aim was to illustrate management priorities and information-acquisition strategies and to highlight differences or similarities between farmers and between species produced. Similarities between cattle and sheep farmers would be interesting to identify, given that differences exist in the number of animals within a herd (with possibly more individual-based management for cattle) and in the organisation of breeding, which is more complex for sheep (e.g., often several breeding periods per year,). We have developed this ranking system as a tool for agricultural advisors to improve the information that they present to farmers.

2. Materials and methods

2.1. Data collection

The study was carried out from 2008–2009 in the Massif Central (Limousin and Auvergne regions) of France. The sample of farmers was constructed according to 3 criteria of their specialised livestock systems: production of only one animal species, availability of data about farm structure and performance and willingness of farmers to participate. Surveys were conducted with 30 cattle farmers and 24 sheep farmers in a two-step process. In the first step, the farmers were asked to classify nine livestock farming domains according to three criteria: attractiveness, satisfaction, and importance (Magne et al., in press). Attractiveness is associated with the perceived pleasure of management, satisfaction with the degree of satisfaction based on results obtained, and importance with the perceived significance for persistence of the farming system. The nine livestock farming domains were: accounts (loans, investments, bookkeeping), breeding management (oestrus detection, pregnancy diagnosis, birth supervision), feeding management (diet calculation, distribution), grazing management (batch composition, stocking rate, pasture rotation), health management (veterinary treatments, disease control, health regulations), herd composition (genetic choices, herd replacement, selection of male sire), production of concentrates (sowing, soil fertilisation, crop management, storage), production of stored forage (sowing, soil fertilisation, silage/hay harvesting, storage) and marketing (place and time of sale, selection of purchasers, price negotiation). Domain definition was similar for all farmers. Each domain was written on cards given to the farmer, who ranked the domains from 1 (high) to 9 (low) for each of the three criteria. Next, the mean rank was calculated for each domain and criterion within each species.

In the second step, farmers were interviewed about information-acquisition methods used to manage the farm system according to three components (Cerf and Magne, 2007; Magne et al., 2010): medium (written, spoken, Internet), content (types of information) and origin (the information source). Each survey was recorded and lasted approximately 2 h. All farms were already known as they were involved in two observation networks (one by the Herbivore Research Unit of INRA and the other by the Livestock Organisation (EDE) of the Creuse department). Data collected from their databases included: farmer age and educational level, farm legal status, number of workers, number of livestock units (LU), area used for agriculture (AUA, ha), principal fodder area (PFA, ha), percentage of crop area in the AUA (%), number of LU per PFA (LU/ha), annual livestock mortality rate (%), number of LU in the reproductive herd (LU), meat production per LU (kg/LU) and per PFA (kg/ha). Economic data included the annual farm income per worker (€/worker) and debt load (% of annual income).

2.2. Data analysis

The ranking of farming domains by sheep farmers ($n=24$) and cattle farmers ($n=30$) was compared using a non-parametric test (Friedman test). When we observed a significant effect among the nine domains, we compared the domains in pairs using another nonparametric test (Wilcoxon signed-rank test). Differences were considered statistically significant at $P<0.05$. Principal component analysis was performed using SPAD software (version 7; Lambert et al., 1996) on a 27×54 database: 27 variables corresponding to the nine domains for the three criteria and 54 farms. The aim was to test the independence of the criteria and the existence of different ways (i.e., groups of farmers) of ranking the domains. The groups were obtained with a clustering method using the coordinates on the factorial axes. Each group was described using farm characteristics. We made between-group comparisons (separately for each species) using either a Student's *t*-test (parametric test) or Mann–Whitney *U*-test (non-parametric test) according to the normality of the distribution. In the same manner, we compared the products (marketing), farming systems, legal status, age of farmers and crop-area classes using a Pearson's chi-squared test or Fisher's exact test.

Information-acquisition methods were analysed by using multiple factorial analyses on a 15×54 database: eight active variables (Table 1) and seven illustrative variables (Table 2), as described by Cerf and Magne (2007). Next, a clustering analysis used the coordinates from the factorial axes to identify groups with differing strategies for acquiring information outside the farm. Finally, we compared the groups obtained from ranking the domains and the strategies for acquiring information.

3. Results

3.1. Farm characteristics

Half of the cattle farms were cow-calf systems without fattening activity (Table 3). Most farms were conventional (83%, versus 17% organic) and had collective status (47% were "GAEC" (French association of farmers) and 33% were