Strategies and management practices of part-time livestock farmers: an example of sheep farming in a French grassland region

C. Fiorelli, J.-Y. Pailleux, B. Dedieu, INRA - UMR Métafort, équipe Transformation des Systèmes d'Elevage, 63122 Saint-Genes Champanelle, France*

Summary

This paper is a contribution to a better knowledge on the operation of sheep farming systems of part time farmers, based on a survey with 35 farms in the department of Puy de Dome. Four types of flock systems were identified with a multiple factorial analysis based on variables characterizing the history of the household activities on and off farm, the current situation in terms of the farm income expectations and the household composition, and the flock management. The types are discussed in relation with the performances and the key properties of the system.

Introduction

In the European Union, part-time farming occurs frequently: 3 farmers out of 4 work on a part-time basis and 9 persons out of 10 for the other family members (Linares, 2003). In France, the pressure of the specialised model, [1 couple, 1 farm, 1 income], pushed out by the agricultural "frame" law of 1962, keeps going among farming unions and is the background of most of the animal production research. Nevertheless, in the herbageous mountains of North Massif Central (Centre of France), both the regional communities and the sheep production sector are interested in the sustainability of part-time farms (Fiorelli et al., 2004). First ones look at the socio-economic dynamics and especially employment generated by part-time farmers and at their contribution to land maintenance in remote areas. Second ones look at the increasing proportion of part-time farmers among the new members in producer's groups and its contribution to the quality signs deliveries, especially at the beginning of autumn (low season).

According to the numerous sociology and economics studies, part-time farmers appear to be different from full time farmers at least on 3 points (Blanchemanche, 2000; Laurent, 1998): (1) their expectations in terms of income could be very little as they earn money with the off farm activities, (2) the implicit goal of increasing or optimising the general farming productivity (animal, land and labour) can have no sense at all, (3) free time to manage the farm can be very little according to the off farm activities and the available labour force. Theses reasons could explain why part time farmers are supposed to be less receptive to the technical packages proposed by the market chain and extension services.

What are the consequences of these assertions on the operation of livestock farming systems (LFS) of part time farmers? What define the main traits and the diversity of livestock activity goals, technical management strategies and practices, performances and resilience of theses particular LFS? Does part-time farming question the approaches of the livestock farming systems? This paper is a contribution to a better knowledge on the operation of sheep farming systems of part time farmers, based on a survey with 35 farms in the department of Puy de Dome.

Material and method

Analysis framework
Referring to the LFS approach (Gibon et al. 1996), our objective is to analyse the diversity of goals concerning the sheep activity and the flock management strategies by collecting data on i) farm history and trajectories (Capillon et al., 1979), ii) flock and land management practices, and performances at the yearly scale. Referring to the social sciences, studies on pluriactivity in agriculture point out the household level, the household composition, and combination of activities, the interaction between the on and off farm activities through the question of income and work, notably the interaction between the working rhythms of each activity (Blanchemanche, 2000).

Sampling and surveying the farms.
The population to be surveyed was made of part time sheep farmers who have more than 50 ewes. The stratification of the population was based on three criteria: 1) flock size; 2) off farm working rhythms, 3) commercialisation scheme (within producers groups or not). 35 part time farmers were surveyed. The sample covered a range of flock size (from 46 to 620 ewes) associated with either fixed or unfixed working-hours activities: two third part-time farmers had been considered having fixed working-hours as salaried people, whereas one third having more unfixed working hours as independent workers or farmer's union elected person. Two third of the sample was made of farmers who sell their lambs through a producers' group. One third was made of farmers who sell their lambs by their own to independent sellers.

Interviews explored (1) the history: evolution of the combination of off/on farm activities and farming activity dynamics, (2) the present situation relative to who live and work on and off farm in the household, and what the money expectations from livestock activity are, (3) the sheep production management and practices of the sheep farm and its contribution to the work organisation, (4) the flock productivity.

Building synthetic variables for a multiple factorial analysis (MFA)
Data is made of quantitative information (structures, performances) but also of qualitative one based on what the farmers said (history, work organisation) and on its description of the sheep production practices. To synthesise this qualitative information, we built new variables and define modalities for each one with the "grille repertoire" method developed by Girard (2004) which aims at categorising knowledge and thinking of experts and actors of the real world. Six variables were defined (cf. table 1). We made a multiple factorial analysis with these sixth variables, to identify the factors of diversity within our sample. It led to a typology of sheep farming systems.

Results

Six variables to understand the sheep farming goals and management (cf. table 1)

- Long terms dynamics was characterised by 2 variables (V1 and V2):
Knowing the history is important to understand the present. We focused on two topics: the evolution of the combination of off/on farm activities, and the farm dynamics. The order of appearance of off-farm and on-farm activities revealed a part of the role of each activity (V1): i) when farming was the first activity to be done, and then often for economic reason an off farm activity was undertaken, off-farm activity started to have the priority on the farming activity in terms of time, income, rhythm. Another case is the one of the farmers getting more

and more involved in farm unions, and so more and more away from their farms, ii) when farming activity had been started long time after starting working often as a salaried, and because of a farm heritage, quite a lot of importance is given to farming activity with respect of money and time invested, but also with respect of technical results expected, iii) on and off-farm activities have been started at the same time and are still on. Constant importance is given to farming activity with respect of money and time invested in the limits of the off farm activities, iv) the household trajectory is quite chaotic, with several beginning and stopping of on and off farm activities. Importance and priority given to the farm activity differed from time to time.
Farm dynamics (V2) gave information on the place of the flock among other agricultural productions and with respect to the importance of the farm structure. Four cases were distinguished : i) regular increasing of the farm activity and especially of the sheep size, ii) stable sheep farming activity, iii) phases of increase and decrease, but always only sheep farming, iv) phases with and without sheep, or with more and more agricultural activities

- *The present situation of the household and the interactions between on and off farm activities was characterised with two variables: who live and work on and off farm in the household (V3) and farm income expectations (V4):*
Analysing "who live and work on and off-farm in the household" allowed us to estimate how important is the availability of the household for the farm work, how many sources of income the household has got. Four modalities were defined based on the matrimonial situation of the farmer and the number of people working on the farm, and both on and off farm: i) one farmer alone, working both on and off farm, ii) one couple, only one person works on farm and this person works off farm, iii) one couple, two work on the farm but only one works off farm, iv) one couple, both work on and off farm.
Expectations of farm income were estimated from a qualitative point of view through what the farmer said: i) "money not a question": there was no income expected from the farm, or the money question never appeared in the way the farmer said to manage his farm, ii) "controlled hobby": the farmers declared that the farm should not lose money but in the same time it is not expected to earn any money, iii) "complement": the farm adds a little in the kitty. The main income comes from the off-farm activity, iv) "important": the farm is expected to provide a proper income to the family and so farm decisions are marked by this income expectation

- *The flock management strategies were analysed through two variables: the lamb production project (V5) and the contribution of the flock management to the work organisation (V6)*
Lamb production project summarizes "when, which type of and how many lambs" are wished to be produced (Hubert et al. 1993, Dedieu et al. 1997). Production projects were categorized on the basis of the flock reproduction and selling management practices (1) periods of mating -lambing: number and period in the year, (2) the mating management: purebred or meat rams used, (3) type of lamb sold: store, 30-35 kg LW fat lambs; 25 kg LW fat lambs, purebred ewe lambs (4) The commitment to the producer's group through the quality signs and the out-of-season production contract. Four production goals types were build from the analysis of the practices of the farmer: i) free reproduction with diversified sold products: rams and ewes together all year round, diversity of lamb produced and sold (stored, finished), ii) free reproduction with finished lambs: rams and ewes together all year round, but only finished lamb sold, iii) there were several mating periods in the year with the differentiation of ram for meat production and (pure breed ram) for replacement. The farmers sell only finished lamb and contract for only one quality sign, iv) 3 lambing per 2 years with its 3 mating periods in the year, and with the acceleration of the lambing interval. Lambs could be produced out of

season. There was a differentiation of the ram breeds for meat and replacement, a diversity of lamb sold (stored, finished, breeding). Farmers signed all the quality signs proposed by the producer's groups sometimes including a contract on a number of lamb sold out of season.

The contribution of the flock management to the work organisation takes into account the various levers a farmer can use to solve its work problems. Madelrieux (2004) proposed to consider three main levers: the labour force (composition and organisation), equipments and livestock management adaptation. She suggested that if the off farm activities is of course a part of the problem of work (less availability of the labour force for farming), its management can be another lever of solution, when the hours or work or the holidays can be adjusted to the farm needs. We proposed a variable that synthesised how far the flock management contributed to organize work and what other lever (labour force, off farm activity) help (cf. figure 1). We assumed it revealed a hierarchy between off farm activity and sheep farming activity.
Three extreme cases were identified to model how people organise themselves to manage their flock activity taking into account the off-farm activity: i) livestock management was mainly tactically adapted from day to day to the other off-farm activities rhythms. Things on the farm were done when labour force and free time from the off-farm activities allowed it. This group of strategies could be entitled "livestock system as the major shock absorber" (cf. figure 1, case1), ii) strategies where the adjustment was mainly made through the free time left from the off farm activities. Day off were taken according to the need of the flock management calendar or rhythm of the off farm activity was adapted: work only at night, never the afternoon…. (cf. figure 1, case 2), iii) strategies where the adjustment was mainly made through the adaptation of the labour force: employments of out of household labour force like agricultural contractor, replacement service, farmer mutual aid, family (cf. figure 1, case 3).
Two other intermediate cases have been observed: iv) adaptation of both livestock management strategy and labour force. The strategy appeared as something built with anticipation to adjust the flock calendar and the off farm activity calendar avoiding work picks from both activities at the same time. The household labour force was complemented by out of household people or agricultural contractor (cf. figure 1, case 4), v) adaptation of both the livestock management strategy and through the free time left by the off-farms activities (cf. figure 1, case 5).

The diversity analysis
The three first factors of the MFA explained 38% of the diversity of the household strategies with regard to the flock activity.
The first factor explained 14% of the diversity. This factor was mainly built from the opposition of:

- the consideration of the flock activity as the shock absorber of the system of activities, a project of production with no target in terms of a number of sold lambs neither a type of lamb nor a period of selling, a farming dynamic made of changes of productions or adding new productions.
- the start of both activities on and off farm together, the project of production with three lambing per two years and sells of lambs for replacement, finished and stored lambs with quality signs and out of season contracts

The second factor explained 13% of the diversity. This factor was mainly built from the opposition of:

- Money expectations being limited to no loss, the decline or several phases of declining and increasing of the flock activity, only one person of the couple working on farm and combining off farm activities, both the flock management and the free time left by the off farm activities being adjusted.
- Money expectations important, two persons of the couple involved on the farm, changes or diversification of the farm productions, adjustment mainly by the labour force on the farm.

The third factor explained 12% of the diversity. This factor was mainly built from the opposition of:
- the project of producing only finished lambs, with or without quality sign, the rams being with the ewes all year round, sheep farming activity quite stable, both persons of the couple working both on and off farm
- off farm activity starting after the farm activity, project of production ambitious with 3 lambing per 2 years and involvement in the quality and out of season lambs deliveries

Five groups of household were identified. We detail four groups which seemed to highlight the diversity of household strategies with regards of the flock activity (cf. table 2). The fifth group appeared more undifferentiated.

- Group "the flock activity seen as the shock absorber of the system of activities"

These farmers had to make their living from the off farm activities, that they started after encountering economical difficulties on their farm. Most of the time there are several off farm activities combined by either the two people of the couple or the farmer himself. They still enjoy farming but farming is no a priority anymore, in terms of rhythms and work organisation. The flock activity is adjusted from day to day to the off farm activity rhythms and available familial labour force. More concretely, some tasks on the flock or on the land are postponed, they do not know how many and when and what kind of lambs they will sell. Selling and replacement are more decided according to the opportunities and to the cash need than according to some flock management prevision rules. The investments can be very low or quite high compared to the flock size or its productivity, in this last case, the farm appears to be subsidised by the off farm activities. The strategy of these farmers could be summarize by the fact they implement a flock management which allow them to adjust the flock operation from day to day to the off farm activity rhythms, free time left and to the labour force availability, willing quite strongly keeping the flock whatever the results they get.

- Group "like full time farmers"

They have high expectations in terms of flock productivity and income encountered on full time farms. They implement highly productive reproduction and feeding management such the three lambing per two years, and differentiation of the feed rations according to the animal requirements. They are very involved and sometimes even committed to the producers groups through contributing to the quality or out of season or pure bred lamb deliveries. Their off farm activity leave them some free time, and if not or too little, they compensate through increasing the available force on the farm. Indeed the production goals and animal requirements come first. So the workers replacement capacity of the system appeared to be an important property of the system.

- Group "adapted hobby"

These farmers do not want to make money neither lose money from the flock. Most of the time, they consider it as a hobby, leisure, activity that they enjoy very much, and they assume it alone. The flock management implemented should allow to "do well" both activities. Indeed

they have some expectation in terms of the kind and the number of lambs they want to produce or the period, they want to sell their lambs but at the same time they do not want to constraint their off farm activity to the farm activity. So for example they choose a lamb mating period that will suit the possibility of taking lots of days off, and only one, they adapt also the flock size to their availability for doing the farm work according to the family or the off farm activity constraints: so from one year to the next one, the flock size can be divided by two or more. So these systems should be able to change quite a lot from one year to another one and to suit other rhythms like family and off farm activity.

- *Group "hobby with technical ambition"*
These farmers started the farm activity long time after started to work often as salaried workers. They were building the flock, but targeted a flock size inferior to 250 ewes. They had technical ambition so they managed several periods of mating/ lambing, they produced lambs under out-of-season contract, and contributed to quality deliveries. Their off farm activity rhythm allowed them to get quite a lots of free time during the week. Their spouse did not work on the farm. Their off farm activity was often agricultural related. They often inherited of the farm from their grand parents. Strategy of these farmers could be summarized as to optimize the productivity of the flock with a flock size given.

Discussion – conclusion
Performances were expressed in terms of numerical productivity (cf. table 2). They differed between groups but were consistent with the flock activity strategy identified. It was clear that the high performances obtained by the "like full time farmers" or the "hobby with technical ambition" groups were not what the other groups aimed at. That lead us to identify the properties of the flock activity which the farmers look for as Landais and al. (1991) mentioned in the studies of extensive systems. As far as the part-time sheep farmers of our study are concerned, the properties identified were:
- inter annual flexibility of the flock size and the reproduction sessions ("adapted hobby")
- day to day reactivity ("shock absorber")
- capacity of workers to be replaced for the routine tasks ("like full time farmers")
- optimized productivity ("like full time farmers", "hobby with technical ambition")

In addition to understand their strategy, identifying these properties questions the way to assess the efficiency of their systems. They also raise questions about the way to take them into account when developing animal production models or innovative systems.

The strategies and functioning of the part-time farms were not as different from the ones of the full time farms as expected even if part-time sheep farms strategies and functioning were said to differ at least on three points as mentioned in the introduction (less time available to do the farm work, smaller money expectation, different goals from increasing the productivity of the production units). It suggests that these points could be also important to consider while studying full time farms strategies and functioning: the full time farmers can have income coming from their partner, can feel like to have free time available out of their farms and then adjust their livestock management, have not always in mind the increase of the productivity of land, animal or worker unit. That should be checked and taken into account while studying full time farms strategies and functioning.

Sheep part-time farming does not mean one project of production, neither one flock management strategy. Sheep part-time farmers appeared to be a heterogeneous population covering strategies i) very similar to the one of full time sheep farmers with high level of productivity and management skills, ii) some others minimizing the tasks to be done, iii)

maintaining the flock from one year to the next one, with no important production goals. They had varied size flock and flock size is not an indicator of what could be the flock management strategy (cf. table 2): i) big and smaller flocks were found in the group "like full time farmers", ii) big and smaller flocks were found in the group "shock absorber". So this diversity requires to be taken into account by the extension services, especially from the producers groups who can not expect the same thing from all the part time farmers. Nevertheless, all of them from the producers groups contribute at least to the ordinary delivery of the producers groups, fewer to the quality delivery, out of season or not and to the pure bred / replacement business.

Taking into account the household strategy appears very important to understand the flock management strategy but difficult: flock activity expectations, responsibilities, decisions making, and operation were indeed often very shared and evolving among the couple. Combining the long term, the mid term history and the current situation should allow us to understand better what does not change and what the livestock strategy are as suggested by Mignon (2001) in the way she studied the conditions of the familial enterprise sustainability and Moulin (2004) in the way he studied long term farm trajectories and technical changes. This implies further research with interviewing several people of the household, giving importance to the household history, and deepening the way flock management is actually operated. Taking into account both information about the household and the flock management to understand both mid term changes and farmer's strategies requires multidisciplinary approaches like Lémery (2004) did.

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Tables

Table 1: Number of households for each modality of the synthetic variables

V1	Chronology of the combination of off farm and on farm activities							
	Farming : 1st activity	4	Farming : 2nd activity	13	Both activities started at the same time	14	Chaotic	4
V2	Farm dynamic							
	Increasing of the farm activity, especially the sheep production	11	Stable sheep farming activity	11	Increase and decreases, only sheep	9	Phases with and without sheep or with more and more farm productions	4
V3	Household composition							
	One farmer alone works off farm	7	Couple but only one person works on farm and this person works off farm as well	l8	Couple with both persons working on the farm and only one off farm	9	Couple with both persons working on and off farm	11
V4	Farm income expectations							
	Money not a question	4	Controlled hobby	7	Complement	9	Important	15
V5	Lamb production project							
	Free reproduction with different types of lamb sold	11	Free reproduction 100% finished lambs sold	7	Meat / pure bred rams, several mating periods per year, 100 % finished lambs sold, one quality contract	4	Meat / pure bred rams, 3 lambing per 2 years, several quality and out of season lambs contract	13
V6	Contribution of flock management to the work organisation							
	Livestock management mainly adapted to the off farm activity rythm	4	Adaptation of the free time left by the off farm activity to the farm activity needs	8	Adaptation of the labour force on the farm	4	Adaptation of livestock management and the labour force on the farm	5	Adaptation of livestock management and free time left by the off farm activity	14

Table 2: Characteristics of the 5 groups identified with the MFA

Name of the group	System Property	Number of household	Numerical Productivities (lamb per ewe per year)	Farm size (min-max mean standard deviation)	Number of ewes (min-max mean standard deviation)	Length of the farming activity (min-max mean standard deviation)
Livestock management = shock absorber	Reactivity from day to day	4	0.8-0.9	40-60 ha 46 10	75-225 160 75	12-38 26 11
Like full time farmers	Worker's replacement possibilities	6	1.4-1.6	39-100 ha 70 24	240-620 413 130	16-36 25 7
Adapted hobby	Flexibility inter-annual	4	0.8-1.4	13-45 ha 25 14	70-110 86 17	7-17 14 5
Hobby with technical ambition	Productivity optimization	6	1-1.4	13-40 ha 24 11	80-245 130 58	1-18 6 7

Figure

Figure 1: Contribution of the flock management to the work organisation