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The importance of livestock farms to the rural and regional development

Beyond production, agro-industrial, food safety and economic profitability aspects, livestock farms contribute to rural and regional development through various production systems, more or less intensive or extensive. It is necessary to consider the territorial distributions and the temporal evolutions of these systems. This participation to the territorial development can be measured in terms of production flexibility and sustainability, of maintenance and dynamism of the sector itself and of the related activities and jobs (industry, trade, diversification…), as well as in terms of biological diversity and landscape preservation.

Analyses of various dairy production systems show that they have significant differences concerning their technico-economic, social or agro-environmental results as well as diversified qualities, which permits a greater or lesser adaptability to changing situations. Thus, "the diversity of breeding systems is recognized as a pledge of adaptation in front of new stakes of agriculture (globalisation and competition on the one side, sustainable development and multifunctional agriculture on the other…)" (Pflimlin and al., 2005). Preserving these production systems diversity, promoting their adaptability, and maintaining the productive sector's dimension on a territorial scale are key factors which guarantee the best possible preservation of animal breeding in a given territory.

The paper's aim

At present, European dairy breeding sector is confronted with a deep crisis. This crisis, aggravated further to the last CAP reform in 2003, raises serious questions about the sector's reproduction. As an example and in the United Kingdom only, "the already very fragile dairy sector will live its strongest restructuring in the five next years owing to 30% of expecting departures" (Madre, 2005, p.7).

Therefore the question of dairy farms' reproduction in Europe, analysed in this paper, is central as regards the future of European agriculture. To begin with, a discussion relating to the general questioning and to the main factors that determine farms' reproducibility, aims at proposing a first classification of situations and their associated factors and at formulating some proposals which can promote dairy farms' reproduction and conservation of their diversity.

Brief presentation of the European milk sector and of its main production areas

The contemporary evolution of dairy farms in Europe is characterized by a technico-economic intensification process, by the reduction of their number and by a degree of geographical concentration[3]. This process was encouraged by socio-economic and technical

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[3] Milk production in the UE-15 countries decreased from 136,2 million tons in 1984 (when milk quotas were introduced) to 120,1 million tons in 2004, which means an 11,9% reduction (Eurostat). During the same period, the livestock of milk cows decreased from 31,9 to 19,2 million (- 39,7%) whereas the milk yield per cow increased from 4.400 to 6.200 kg (+42,3%). From 1996 to 2004, the number of dairy farms fell from more than one million to less than 600.000 (- 41,2%), whereas the production per farm increased from 112,6 to 192,4 tons (+70,9%). The average number of milk cows per farm went up

factors, as well as by policies and structural improvement and early retirement programs. These evolutions raise the problem of farms reproduction and of their functional and territorial diversity (technico-economical and social viability, family projects and farms' reproduction strategies failures, etc) and, therefore, of the sector's continuity and its contribution to the territorial development.

Guesdon and al. (2006) analyzed dairy livestock concentrations in various European Union areas in 2003. Particularly strong livestock concentrations (> 10 cows per km² of regional total surface area) are observed both in Atlantic and in Continental and Alpine Europe. These concentrations are distributed within the four following areas, corresponding to 9 "large geographical basins":

- The North Sea (one big basin): Northern France, Belgium, Luxembourg, Netherlands, North-western Germany, Denmark.
- The Atlantic arc (four basins): Northern Spain (Cantabric Cornice), North-western France, Mid-west United Kingdom (including Wales and Northern Ireland), South-eastern Ireland.
- The Continental alpine Europe (three basins): East France and Massif Central, South-western Germany, Bavaria and South-eastern Germany, Northern Italy (Po valley).
- The Continental East Europe (one basin): East Poland.

Breeding systems disparities are remarkable among these production areas, as well as within each area. Table 1 presents dairy farms percentages in each basin compared to the UE-15 total number (632.600 farms), their milk quotas compared to the UE-15 average number (206.400 kg) and the number of LU (Livestock Unit) of grazing livestock per hectare of Main Forage Area (MFA).

Table 1: Structure and economic results of dairy breeding basins in the UE-15, in 1999

Milk production basins	% Farms (632.600 = 100%)	Milk quotas (206.400 kg. = 1)	Livestock Unit (LU) of grazing livestock / ha Main Forage Area (MFA)
Main basins			
North Sea	15,1%	1,54	2,4
Atlantic arc	27,9%	1,09	1,9
Alps area	29,3%	0,96	1,9
Other basins			
Mediterranean	10,8%	0,56	2,4

Source : Modified according to Chatellier and Jacquerie, 2004

According to the above table, those main basins include three quarters of the dairy farms' total number (almost 45% of them are in the Atlantic areas and in the North Sea). The Mediterranean area only accounts for approximately 10% of them. The rest is located in more peripheral areas of Continental and Alpine, Boreal and Atlantic parts of Europe. The average milk quotas in the Mediterranean region are approximately half the average milk quotas in Europe, as a result of the ill-distributed milk quotas within the European Union[4].

from 22,3 to 29,4 between 1996 and 2002 (+31,8%). Thus, the European dairy herd underwent a process of concentration, i.e. less farms, located essentially in some large basins of the biogeographic areas of the Atlantic/ North Sea (45% of the total farms' number), and of the Continental/Alps area (35% of farms).

[4] Following the negotiations and procedures of global guaranteed quantities' attribution to each Member State, the EU Southern countries received much less quotas than the Northern countries. Breeders of the first group are in general smaller and less organized within farmers' unions than the

With regard to the most current breeding systems inside each of these regions, in the Atlantic areas, stockbreeders tend to use mostly grazed and ensiled grass to feed their herds. Sometimes they also use some other fodder like ensiled corn or other fodder cultures and only buy a relatively small amount of cattle-feed. On the contrary, in Continental and Mediterranean Europe areas, grass, even when it exists, is not always pastured (there is no grass production in the Mediterranean and only a discontinuous one in mountainous areas). In these areas (and especially in the Mediterranean), while quotas are generally lower, the intensification and the purchase of concentrated cattle-feed is frequent.

According to the European territories' and systems' breeding zoning suggested by Pflimlin and al. (2005) in addition to the biogeographic areas "Boreal", "Mediterranean" and "Wet Mountains", two other areas can be distinguished : the "Atlantic" and "Continental" plains. These areas, where the majority of dairy farms can be found are divided in a less intensive area ("pastureland"), a mixed area ("pastureland + corn") and three more intensive areas ("fodder cultures", "cultures + breeding" and "cultures"). This zoning comparison with the main production basins previously described enables us to define specifically the territorial matches to the breeding systems of these basins (Table 2).

Table 2 – Distribution of the grazing cattle-breeding areas in the main milk production areas in the UE-15

			Main production areas (ensemble of basins)		
			North Sea	**Atlantic arc**	**Peri alps**
Main cattle-breeding areas of grazing livestock	+ Extensive → ← + Intensive	**Wet mountain**		Spanish NW Coast	Massif Central, Jura The Alps to the SE of Austria
		Pastureland	Belgian Ardennes Sarre and Hesse in Germany Old Netherlands polders	Ireland and N. Ireland Wales and W. England	NO Circumference of the Massif Central NE France (from Bresse to Lorraine)
		Pastureland + corn	E of the Netherlands NO of Germany (Low Saxony and Schleswig Holstein Luxembourg	Norman bocage	Foothills of the S of Bavaria
		Fodder Culture	Belgian Flanders SE of the Netherlands	Brittany and Pays of the Loire W of Galicia and N of Portugal	NE Bavaria Emilia- Romagna in the south of Po in Italy
		Culture + breeding	Danish Jutland Border of n. Germany N of the Paris basin	Central England NW of the Paris basin	Center and N Bavaria New SE German Länder N shore of the plain of Po

It is obvious that various areas and breeding systems with regard to their intensification level exist within every production area. In the North Sea area, more intensive areas are more frequent (culture + breeding, fodder culture, pasturelands + corn) than in purely pasturelands systems of Southeast Belgium, of Central-West Germany and of the old Netherlands polders. On the contrary, in the Atlantic Arc area the more extensive pastureland systems dominate, as in Irish mountains, Western England and North-western Spain (though in North-western France and Central England there is a high rate of more intensive systems). In the area around French Alps and in Northern Italy more extensive

latter. Nevertheless they are subjected to the same EU regulations as the big stockbreeders of northern Europe.

systems can be found. The most intensive systems are concentrated in Germany and around the plain of Po.

Assets and constraints of each operating system and impact on farms' reproducibility

The various breeding farming systems play an important part in the sustainable development of the rural areas in which they are applied. This contribution concerns economic, social and environmental objectives at the same time. The following analysis, though by no means exhaustive, deals with this contribution and the strong and weak points and of each system with respect to its multifunctionality and in relation to farms' reproduction.

a. Economic factors

The aim of the present paper is not to describe in detail the complete set of economic or financial factors that determine farm's functioning and economic viability, but to underline some of them which are strongly related to its reproduction.

A farm's "economic viability" has to be examined in relation to each asset and constraint of its farming system, which play a more or less important role according to each production system (Barrio, 2007). The production system is defined in particular in terms of intensification level (according to some indicators: pasture days / Livestock Unit (LU), LU/ Produced Fodder Surface in ha, milk (lt)/cow, milk (lt) /Annual Work Unit (AWU), Concentrated cattle-feed (€)/milk (lt), etc.) and of farms size (indicators: Gross Margin, Adult Bovine Units' number, milk and meat gross output). Size and intensification evolutions depend, among others, on the limitations or opportunities in rights to produce (milk quotas).

Various farm structures assets and constraints (according to intensification and size) depend on their relation to their main incomes and expenses. This means that they depend mainly on the price of milk, the allowances and the cattle-feed cost. They also depend on other supplies' and veterinary services' cost, on wage-earning labour and on land cost, on the redemption of production means, etc. Moreover, it is necessary to take into account family opportunity cost, in terms of capital and labour.

Thus, the more intensive farms are more sensitive to market fluctuations in terms of cattle-feed and milk prices (Chatellier, 2002). On the one side, their cattle-feed expenses are higher because they are not very autonomous systems. In fact, they are high consumers of concentrated cattle-feed. On the other side, their incomes are more sensitive to falls in milk prices since they are big producers and their marginal production costs are likely to become excessive in case of relatively weak prices falls. For the same reasons, intensive systems are more sensitive to the milk quotas system, even when available milk quotas (coming from retirements, withdrawals of the agricultural activity etc.) are not sufficient to cover negative economic results which could have been limited by more important enlargement possibilities.

On the other hand, the rather extensive farms are more sensitive to land market's evolutions (concerning both renting and purchase) and to basic labour costs relative to the management of their fodder and pasture system. This is linked to the fact that these breeding systems are characterized by a high number of pasture days (and consequently a low number of UGB/ha) and by a relatively self-production fodder system (grass, hay, corn, ensilages, sometimes even of cereals …). The semi-intensive systems are in an intermediate situation in terms of structure, farm's capital and functioning: they produce some of their cattle-feed and buy some other.

Very wide-ranging situations can be found in the field. In the case of highly capital-intensive farms, looking for greater productivity, reproducibility can be limited if a family member does not take over, since they have reached too high a price. In central and northern Europe, semi-extensive and extensive dairy farms are still frequent: these farms are faced with land and labour constraints (shortages…), that also jeopardises their transmission.

Different farms' size levels also have different assets and constraints. Small-scale farms are freer to employ their labour for other internal or external to agriculture activities. This pluriactivity enables them to accumulate incomes for different sources and thus to diminish the risks related to the productive specialization which undergo bigger, more intensive farms. On the other hand, bigger farms are more capable to achieve scale economies, to invest in productivity or to establish special relationships with milk collection companies which can pay higher prices.

In any case, industry and distributors' pressures on the fixing of producer milk prices are a very important factor. On the one hand, milk collection and transformation companies select producers and propose them contracts, which in some cases they cannot refuse. On the other hand, large distribution chains, using their own trademarks and controlling offer management in supermarkets, often have more weight than industries with regard to milk and other dairy products sales margins.

Actually, a majority of farms has entered an intensification process, which has to be connected to market pressures (milk prices, collection companies' strategies etc.) to growing difficulties in case of extensive farming systems (lack of production factors : of agricultural lands to rent, trained labour etc.), to running business pressures (commercial, technological and legislative) and to administrative incentives towards "modernization". The intensification processes have been drifting, following capital concentrations, from family farming systems to companies, whose "professional" image implies a recession of the image of the extensive alternative breeder. Consequences of these evolutions were: farms reduction number, farms high geographic concentration, families' indebtedness because of investments, increased difficulties of resumptions or setting-ups other than family ones, etc.

b. Social factors

Farms reproduction does not only consist of economic capital reproduction but also of the reproduction of parameters relating to human capital (social status, knowledge, cultural capital, intellectual and symbolic associated systems) (Vounouki, E., 2004). Consequently, it does not only concern the reproduction of goods, which enables the agricultural family to survive and to get reproduced biologically, but it also concerns the reproduction of links, values and beliefs which insure family group's cohesion.

In addition, reproduction of a trade is part of a social reproduction's framework (Vounouki, E., 2004). Within this framework, it represents a positive or negative value which is defined in relation to the profession's social image and its rank within the social hierarchy. "Farmers' professional identity is an evolutionary structured group that can change unceasingly, because of tensions and interactive mediations which function like catalysts, in and on the individual" (Abdelmalek, 1996).

Big farms are often run in a way, which is close to that of small or medium-size enterprises. But there are still small size family farms. More or less important disparities can be found among farms, oscillating between over-specialized productiveness and very high pluriactivity[5]. Differentiated farmers' social classes and images can be found because of those disparities. Differences can be observed among farmers, belonging to various agricultural sectors and social images: within this range, the stockbreeder's image often ranks among the most negative ones at least for the young, surely because of the job's strenuousness. The need of a permanent presence on the farm[6], the hard physical work, and the constraint of milking are often the main elements of this strenuousness, even if it has

[5] The existence of various socio-professional unions, with different claims according to represented farmers' groups points out the heterogeneity of farmers' profiles in different countries.

[6] Partly, in order to deal with all their interlocutors (buyers, suppliers, veterinarians, technicians, controllers…), and to the bureaucratic higher bids related to controls and analyses, filling-up forms, taxes and subsidies.

been partially mitigated in many situations thanks to the co-operative organization offering the stockbreeders' support and substitution services.

Besides the stockbreeder's own vision of himself, other people's projected images (coming from the local or global society) also play a very important role. There is a social perception of a farmer's low prestige and a long process of abandoning or even of substituting activities in rural areas. This causes an increasing feeling of remoteness (colleagues, neighbourhood, friends, family relationships and spouse research) and a lack of incentives concerning farms takeovers or young people's setting-ups.

Within this social reproduction's framework, a new image of the farmer – businessman is emerging (often related to the most intensive farms). However, this is not enough to change radically the general low-prestige farmer's social image established over years. The fast rise of some farmers' living standards has sometimes led to suspicion of frauds, doubts and distrustful feelings concerning the benefit of some undeserved allowances in the eyes of town folks. Currently, farmers must also fulfil people's demands concerning the guarantee of food products quality (accentuated further to the recent food crises).

c. Environmental factors

According to Pflimlin and al. (2005) (Table 2), the "Mountain", "Mediterranean" and "Pastureland" areas (i.e. the three disadvantaged areas facing strong pedoclimatic constraints) represent more than half the UAA- used agricultural area- and more than ¾ of the Permanent Grazing Lands, as well as 60% of the herbivorous livestock farms and 40% of milk cows. These areas have a more important role to play regarding water, biodiversity or landscape. Moreover, they have often developed specific regional products benefiting from local quality labels. On the contrary, "Cultures fodder" and "Cultures + breeding" areas, corresponding to the most intensive farming systems, are more directed towards staple goods' production and their environmental assessment is much less satisfactory.

The industrial and polluter image of farmers is another big challenge which they must face. On the one side, assimilations can be made between agricultural activity and environmental degradation, which are stronger in the case of intensive farming systems. On the other side, the social and environmental role of the extensive stockbreeders (in terms of landscape influence) is not sufficiently recognized. Their practices produce a limited benefit in terms of the social image of breeding (the cow in the meadow, the living countryside…), and of its technico-economical remuneration (agricultural land management, employment allowances, agro-environmental subsidies, compensations to the natural handicaps or the support of quality products).

Conclusions: Proposals regarding the promotion of dairy production systems' reproduction and diversity conservation

Several EU member States have not exhausted their allocated milk quotas since 2003. According to a Commission Report to the Council (Commission of the European Communities, 2007), this fact is due to the lasting rigidities in the milk quotas transfer (which means that the quotas remain fixed per Member State and within some Member States per area or even per dairy transformer and that their reallocation must be done inside these limits), to the context of progressive reorganization and continuous decline of the dairy producers' number (so the unused quotas cannot always be taken over by other producers, for fear of low profitability) and finally of more profitable alternatives than dairy production (a more thorough examination is necessary in order to determine to which degree decoupling aids contributed to the underutilization of milk quotas).

- Breeding systems and farms' sizes diversity[7], based on the safeguarding of a sufficient number and types of farms all over the European territory, seems to be the main guarantee of the dairy production's multifunctionality and sustainability in the EU, and consequently of the productive sector itself in the long term. In order to promote milk production systems' reproduction and diversity conservation, economic, technical and social measures should be put forward at the same time.

- The preservation of milk quotas, as a management tool of the offer, is necessary in order to guarantee the sales and to achieve remunerative prices, to control production and share its benefits. The improvement of management at national level is essential for applying the benefits of the tool to this various systems and production areas. The improvement of milk quotas intra-community distribution is also an absolute necessity in order to answer to the various Member States demands (and not only to those of the intensive areas producers).

- The reduction of income risks has to be achieved through satisfactory producer prices (as well as satisfactory consumer prices: production quotas, industries' and distributors' benefits limitation), quality productions and natural handicaps' compensations as well as compensations for the social and agro-environmental and landscape role of extensive breeding.

- Risks related to taxes and problems regarding succession have to be reduced, through greater autonomy and economy of cattle-feed production, limiting intensification and enlargement, management of agricultural rental land (in order to allow the survival – and/or enlargement - of more extensive farms), larger availability of well-trained and correctly remunerated labour, etc

- Socio-economic cooperative organizations in rural areas, offering better support and substitution services to stockbreeders, including the pluriactive ones, have to be promoted.

- The profession's social image has to be enhanced (through the coordinated actions of awareness campaigns, training and information) and special emphasis has to be put on its importance as a structuring element of rural environment territory. The social, economic and environmental integration of the professions with the rest of rural world and global society stakeholders has also to be promoted.

- Allowances and other incentives to resumptions and new setting-ups have to be increased. These measures must be integrated within a group of coherent measures intended to ensure a sufficient number of farms. They must therefore be part of a global program taking into account the retirement allowances in order to ensure a balance between them.

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[7] This diversity is closely linked to a given geographical distribution (analyzed here on the European scale) and to the specific qualities of production systems with regard to the reproduction of farms and to the three functions (economic, social and environmental) attached to sustainable development.

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