Livestock Farm Networks, a system at the centre of French farming development

Carole Jousseins (1), Jocelyn Fagon (1), Julien Belvèze (1), Gérard Servière (2)
(1) Institut de l’Elevage (French Livestock Institute), BP 42118, 31321 Castanet-Tolosan Cedex, France
(2) Institut de l’Elevage (French Livestock Institute), 9 allée Pierre de Fermat, 63170 Aubière, France

Abstract:
The Livestock Farm Networks system is dedicated to the development of herbivore farming. As they result from the history of French agricultural development, these Networks are to be found all over France and are organised at local level. The originality of this system is its partnership between farmers, Chambers of Agriculture and the French Livestock Institute, and from the fact that it uses the global approach in taking account of the diversity of livestock farming regions and the study of livestock farming systems. The idea is not to be exhaustive, but to be representative of herbivore farming systems in the choice of the systems studied; to measure their evolution and create and diffuse benchmarks drawn from the monitoring of 1900 farms carried out by 210 Chamber of Agriculture agents, guided by 35 project leaders from the French Livestock Institute, financed and supported by Public Authorities and the professional agriculture bodies. The regional and national valorisations of the Networks are addressed at different audiences: farmers and advisers belonging or not to the Networks and teachers for use in advice or training, individual or collective. Local and national decision-makers use these productions to improve their understanding of livestock farming systems, to measure the impact of new farming policies and direct their implementation. The role of the Networks is also illustrated in their capacity to become mobilised and reactive on emerging themes in the livestock farming sector. The aspects of viability and competitiveness, liveability and working conditions, or even environmental issues were covered by the system’s fields of study well before the «Sustainable Development» concept became topical. Livestock Farm Networks, being a partnership system, are sometimes complex to manage, and they may appear costly, but it is this strong and well-recognised partnership which makes them such a valuable resource and ensures their recognition and legitimacy. The variety of farming productions and the heterogeneous nature of the farming systems are a good breeding-ground for innovations and enable French agriculture to adapt to new challenges. Not only do the Livestock Farm Networks make it possible to observe these evolutions, they act as their catalyst and guide, and help to disseminate them.

Keywords:
Livestock farming systems, Networks of benchmark farms, Global approach, Partnership system, Agricultural development.

History and territorial organisation of agricultural development in France

Before describing this partnership system which monitors and covers the diversity of French herbivore farming, we present the overall structuring of agricultural development and briefly describe the livestock farming systems to be found in France.

As early as the 1950s, the organisation of agricultural development and advice in France (training, advice, experimentation, dissemination) adopted a very strong collective dimension. Since the 1960s, this organisation has been situated between public policies and proximity relationships (Compagnone et al., 2009). Relations between the State and the farming profession eventually led to the co-management of agricultural development (1966). The organisation implemented at the time was designed to be applied evenly over the whole territory. As time went by, the organisation of advice inherited from the period of farm modernisation and production growth was able to adapt in its methods and intervention themes. It became less prescriptive, and adviser-farmer relations became more collaborative. Multi-disciplinary expertise was strengthened. The group approach to create a local climate favourable to innovation and to set up projects in common was encouraged even if the demand for more personalised individual advice persisted.
The development structures guiding and advising livestock farmers in their projects were established according to a territorial network based on the administrative departments. Departmental Chambers of Agriculture, the elected institutional representation of the farming profession and many people active in the rural world, have regularly seen their roles become reinforced. They give direction and leadership to actions of support and guidance as well as advice to farmers for the diffusion of technical and economic innovations in livestock farming. Cooperation and economic organisations are also prescribers of technical and sectorial advice.

The Technical Institutes carry out functions of applied research, expertise, engineering, training and technical coordination for their sector (the French Livestock Institute for herbivore farming, Arvalis for plant productions). Public research organisations, such as the National Institute for Agronomic Research (INRA) are situated upstream of this system to establish the basic knowledge.

Covering the diversity of the major livestock farming regions

In Europe, France is positioned among the first three countries for numbers of ruminants, as it has the leading cattle herd (19 out of 89 million head), it is sixth for numbers of sheep (8 out of 91 million head), and third for goats (1.3 out of 11 million head) (source Eurostat, data for 2008). These animals are distributed all over the territory (figure 1), linked to the diversity of French geographical and soil and climate contexts from north to south and from east to west, which this same figure does not illustrate. The development of livestock farming associated with agronomic potentialities and climatic constraints has led to a differentiation of production areas. These areas tend towards either dairy or meat, but they are not strictly specialised or limited to regional boundaries. This is why the twenty or so French administrative regions or the simple plain / mountain dichotomy cannot represent this diversity.

Figure 1: Location of herbivores in France and relative use of the territory by each category of herbivores – (Source: Agreste 2008)

Faced with this mosaic of geographical, soil and climate and farming specialisation, the French Livestock Institute has devised zoning to present French livestock, to understand its functioning strategies and evaluate the impact of political measures at different scales. It also encourages dialogue at regional, national or European levels (Pfimlin et al., 2005).

Five criteria were chosen to classify the areas (Rouquette et al., 1995):

1. The soil and climate environment with a combination of climatic and soil and relief type parameters.
2. The physical structure of the farms (size, field pattern, possible mechanisation or not...) defining local production and working conditions and also perhaps depending on local, economic and social history.
3. The potentialities for forage crops which influence the choice of animal productions (e.g. maize silage possible or not).
4. Local demography and land pressure.
5. The dynamic of local organisation of production and enhanced value (Protected Designation of Origin (PDO), Traditional Speciality Guaranteed (TSG)).

From these criteria, 8 « major agricultural regions » have been described, 7 of which are very important to livestock farming: mixed crop-livestock farming area, forage area, intensive area, grassland area of the north-west and grasslands of the centre and east, pastoral area, wet mountain area, high mountain area (figure 2).
The Livestock Farm Networks, a global and territorial approach to livestock farming

The result of a long history

The first thoughts and implementation of systems for monitoring and analysing livestock farming systems date from the late 1970s. The idea of building development projects devised collectively and organised as a partnership has been supported by the State and by leading farming professionals since the 1960s. As recalled by J. Cochard (Cochard, 1974) in his thoughts on Research and Development, everything that deals with technical progress and its diffusion must restrict itself to the golden rule of a pragmatism founded on the knowledge of what is real. The idea then emerged of a network permanently collecting global and analytical references both in large numbers and in real size, at a level where it is certain that real problems will have to be faced, i.e. at farm level. There were already some examples of networks in Great Britain: « Low Cost Production » (dairy systems) and the « Meat and Livestock Commission ». In France, many grassroots players were already working together (Chambers of Agriculture, Farm Management Centres, Technical Institutes). Their partnership had to be encouraged by structuring the missions and expectations of such a system.

Tried out for some animal sectors and a few French regions by the Cattle Farming Technical Institute (ITEB) in then the Sheep and Goat Farming Technical Institute (ITOVIC) (founding structures of the French Livestock Institute), these monitoring systems took their inspiration from the experience of local development groups in which a group leader and several farmers held discussions about their practices and gave collective thought to solutions adapted to their situation. There was in fact a dimension of territorial development in these groups, but there was not very much dialogue or transfer of information between the groups or beyond these groups (Compagnone et al., 2009).

With the foresight network Cattle Breeder of Tomorrow (Eleveur Bovin Demain - EBD) created in 1981, regional and departmental engineers were commissioned to monitor efficient and/or innovative and original livestock farms, to construct technical and economic benchmarks adapted to regional contexts and transfer these markers to as many people as possible, in order to suggest paths to take in the future (beginnings of the concept of sustainable development). The analysis method was refined (Lebrun, 1991), monitoring, collection and centralisation tools were deployed (Diapason software) then the system changed its name and adopted its present name of Livestock Farm Networks, at the same time retaining its missions and using them to enrich its fields of action and study themes.
At the present time, this system appears to be original at international level, because few similar organisations have been found in our bibliographical research, even though we know that equivalent systems are in place in a few countries (Parana State in Brazil, Vietnam…).

Missions and objectives of the Livestock Farm Networks

The system’s territorial organisation (location of teams) and the productions which result from this work, follow the coherence of the zoning previously described. Three missions are allotted to it: to observe the livestock farming systems in place in the regions, to identify and support innovative systems, and to transfer and distribute the productions in the form of tools, methods, training and publications. To do this, the system is organised so as to describe farm functioning in the form of global references, expressing various possible balances and in a defined local context. The detailed and regular monitoring of farms over several years also make it possible to describe farm evolution patterns and paths of evolution which lead to new balances.

The global and systemic approach, the trade mark of Livestock Farm Networks monitoring

Managing a livestock farm requires the mobilisation of several resources that have to be organised in a complex fashion to make it possible to achieve multiple objectives. Considering a livestock farm in this way, taking account of interactions between biotechnical and human dimensions, corresponds to the definition of a livestock farming system (Dedieu et al., 2008). This systemic vision translates the coherence between herd management and land management, between agronomy and environment, between economic choices and technical choices, between farmer projects and the means to be implemented to achieve them. Communication with the farmers, presenting many viable production systems from the viewpoint of workloads and economic results, and accurately describing coherent operational sequences taking all the units and production systems into account, are integral parts of the system’s missions (Delaveau et al., 1999).

The livestock farming system concept is illustrated in figure 3. The resources mobilised in a livestock farm are described and detailed in the main framework and are the basis of the information to be collected in the system. The farm evolution pattern is also studied by monitoring the livestock farms and their evolution over several years. These farms are positioned in a variable social, political, economic and environmental context. Taking these variations into account questions all of the players in agricultural development and determines the direction taken by the work and publications carried out by the system.

*Figure 3: Representation of a livestock farming system and its components* - (Source: French Livestock Institute)
A system which requires method and coordination

The Networks, supported financially by public authorities and the agricultural bodies

To be coherent and effective, this system mobilises many players over several years and requires considerable support and guidance work and farm monitoring. The public administrative establishment, FranceAgriMer, provides strong support for the Livestock Farm Networks system. This establishment comes under State supervision and works jointly with the Ministry of Agriculture. Public funds are therefore mobilised on this system as well as professional farming funds (CASDAR). The financial budget corresponds to 5 days of work per farm, 50% financed by FranceAgriMer and topped up by financing particular to each structure (notably CASDAR).

Operational functioning of the system

To carry out the missions entrusted to it and in view of the many partners involved, such a system requires coordination. The partnership functions very closely between the French Livestock Institute and the 86 departmental bodies. The organisation of agricultural development in France described earlier makes it easier to set up such an organisation because working habits already exist between organisations and consultation authorities. Another key point, agricultural development plans are identical from one region to another.

Figure 4: Number of livestock farms monitored per administrative department and per sector in the Networks - (Source: French Livestock Institute – Livestock Farm Networks)

Thus, the system makes it possible to illustrate the diversity of the systems to be found in France but does not aim at an exhaustive representation of all French livestock farms. The monitoring carried out provides fine knowledge of the functioning and coherence of each livestock farming system.

So the choice of the systems to be monitored is important. This choice is made in conformity with the objectives sought by the system and by monitoring the zoning previously presented.

Figure 4 and table 1 situate the farms studied per administrative department and per sector. These farms follow the geographical distribution of the French farms presented in figure 1.

Table 1: Farms monitored per sector and financed by FranceAgriMer in association with the number of professional livestock farms in 2007 - (Source: Agreste survey structure 2007 – Metropolitan France; French Livestock Institute – Livestock Farm Networks)

<table>
<thead>
<tr>
<th>Animal sectors</th>
<th>Number of farms monitored in the Networks</th>
<th>Including mixed systems</th>
<th>Number of French professional farms* in 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef Cattle</td>
<td>450</td>
<td>Beef and Dairy Cattle</td>
<td>100 200</td>
</tr>
<tr>
<td>Dairy Cattle</td>
<td>400</td>
<td></td>
<td>90 100</td>
</tr>
<tr>
<td>Meat Sheep</td>
<td>380</td>
<td>Meat sheep - Beef Cattle; Meat Sheep – Dairy Cattle</td>
<td>29 200</td>
</tr>
<tr>
<td>Dairy sheep</td>
<td>60</td>
<td>Dairy Sheep – Beef Cattle; Dairy and Meat Sheep</td>
<td>4 800</td>
</tr>
<tr>
<td>Dairy goat</td>
<td>130</td>
<td>Goat and Beef Cattle , Goat and Dairy Cattle</td>
<td>10 400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1420</strong></td>
<td></td>
<td><strong>234 700</strong></td>
</tr>
</tbody>
</table>

*definition of professional farms: Agreste – Eurostat: The professional farm holding satisfies two conditions: its economic dimension is greater than 8 units of European dimension (UDE), i.e. the equivalent of 12 hectares of corn. The quantity of work applied to it is at least equal to 0.75 annual work unit (AWU).
A regional organisation relying on Manpower

The system is organised regionally and relies on the regional organiser / grassroots technician / livestock farmer trio. The numbers in each category are specified in table 2. The regional organiser coordinates the actions, fixes the methodological framework and provides the tools to carry out the monitoring. The technicians of the Chambers of Agriculture make regular visits to the farms at key periods of the year to understand how the farms function (farmer objectives, past evolutions, projects) and to collect the information necessary to describe the livestock farming system (workforce, production means, technical results, economic results and environmental impacts - figure 3). The technician-livestock farmer pair functions in an approach of reciprocal dialogue. The technician collects information and reproduces it in the form of diagnoses and advice for the farmers (progress approach), who can ask to work on studies of projects to improve or modify their farm. The technicians are more often specialised by sector rather than on this benchmark activity. They rely if necessary on technicians with complementary skills (feed, buildings, reproduction) (Dockes et al., 2010).

The regional teams meet regularly to harmonise the collection of data and process the information. The data collected are stored in a national database managed by the French Livestock Institute: Diapason (Charroin et al., 2005). Nationwide discussion between regional organisers ensures that the work is harmonised and organised over the whole of the territory (surveys, for example).

Table 2: The human means of the national system - (Source: French Livestock Institute – Livestock Farm Networks)

<table>
<thead>
<tr>
<th>Livestock farms monitored nationally (all sectors)</th>
<th>Agents in charge of monitoring (Chamber of Agriculture, other bodies…)</th>
<th>Project leaders for guidance and use of the system (French Livestock Institute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1420</td>
<td>210 (i.e. average: 9 farms monitored / agent)</td>
<td>35 (i.e. average: teams of 6 agents at regional level)</td>
</tr>
<tr>
<td>+ 500 monitored on regional funds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Products and achievements of the system

Regional and national productions take the form of technical and economic benchmarks presented per system (specialised sheep in the Massif Central, mixed crop-livestock farmers in the plains of the South-West…); syntheses of theme studies (energy in livestock farming, mechanisation); results of annual surveys or of methods and tools. New themes have gradually been included in the monitoring (e.g. mineral balance, energy, production costs).

The analysis and comparison of several farms quite close to each other makes it possible to describe and build coherent, efficient models of farms observable in the field called « farm typologies ». These virtual but functional farms are useful for advisers to simulate farmer projects and distribute functional markers. Politicians can also use them to study the impact of changes in direction of support policies (see below).

Uses and users, individuals and collectives

Monitoring makes it possible to identify, describe and build coherent, efficient production systems adapted to local potentialities and constraints that the farmers can put into application on their farms. As strategic decision-making tools in the individual framework of a farmer-adviser relationship, these technical, economic and thematic methods, benchmarks and markers enable livestock farming advisers to make diagnoses and guide the farmers in their thoughts and projects (development of new units, technical reorientation, installation…). All these productions and studies make it possible to provide the training and expertise for a body of livestock farming advisers.

The use of these analysis and simulation tools by local or national decision-makers improves their knowledge of the production systems in place over the whole of the territory (Delaveau et al., 1999). They can test and measure the incidence of new agricultural policies on the different systems in place (CAP - Common Agricultural Policy) reform influencing the construction of forage systems, support to mountain systems) and thus orientate the final decisions and application methods.
The Livestock Farm Networks mobilised and reactive on emerging themes in the livestock farming sector

Using selected examples, the following part deals with the presentation of individual and collective uses of the Livestock Farm Networks system. These examples respond to the three pillars of sustainable development (economic, environmental and social).

Measuring and strengthening the competitiveness of a livestock farm

In an economic context that is global and competitive and in a market of agricultural raw materials that is increasingly volatile, it is essential for each player in the industry to know his production costs. Numerous calculation methods exist and are applied to farms but they are often partial and do not take the whole of the charges into account (depreciation and opportunity costs for example). The mixed activity of French farms makes it difficult to break the charges down per unit (Charroin et al., 2010).

Since 2007, the French Livestock Institute has relied on the technical and economic data of the Livestock Farm Networks to propose a national method, compliant with international accounting regulations (International Farm Comparison Network, Agri-Benchmark) and applicable to all herbivore farms. This method, applied to the farms in the Networks made it possible to build benchmarks per production system. It is now a basis for many training schemes for technicians in France and livestock farmers who are not in the Networks. In the framework of individual advice, these farmers have knowledge of their production cost per unit produced (1000 litres of milk, 100 kg of live meat produced or of carcasses). By comparing themselves with the benchmarks, they can identify their progress margins.

The use of these production cost calculations can also be collective. Livestock farmers can use them to negotiate the sale price of products from their farms. For elected representatives, observing the areas of production and their difference in competitiveness can direct public policies of support to farmers for the maintenance of farms in less favoured areas.

Preserving your environment and limiting your ecological footprint

Environmental themes are increasingly evoked in demands from European societies. The environmental impacts of farming, and of livestock farming in particular, are regularly discussed (Le Gall et al., 2009). As a consequence, the Livestock Farm Networks system has integrated methods for measuring impacts on the environment. The evaluation of excess nitrogen, phosphorus and potash was set up in the early 1990s. In recent years, energy consumption and greenhouse gas (GHG) emissions are measured in all the farms monitored (Hacala et al., 2006). The Livestock Farm Networks system makes it possible to take on-farm measurements of these criteria to determine the positioning of the livestock farm models in France illustrated in table 3 (Charroin et al., 2006; Galan et al., 2007). The uses of the data have demonstrated how low consumption farms function with low emissions of greenhouse gases.

Following the assessment by the « Grenelle Environment Forum » held in 2008 in France, the public authorities commissioned the Energy Performances Plan (PPE) to limit environmental impacts from French farms. Via the Livestock Farm Networks system, the French Livestock Institute collaborated with the ADEME (Agency for the Environment and Energy Control) and its partners in developing a tool and a method (DIATERRE) of making diagnoses of the energy and greenhouse gases in farms. In response to the objective of 100,000 farm diagnoses, training programmes were set up for farming advisers. At the beginning of 2011, around 300 advisers were trained. They are now using the diagnostic tool and the technical markers worked out from data from the Livestock Farm Networks (Morin et al., 2010), enabling farmers to qualify their energy consumption and reduce it.
### Table 3: Description and environmental performances of the main dairy systems in France - (Source: Le Gall, 2009)

<table>
<thead>
<tr>
<th>Systems of forage crops in West France and in foothills</th>
<th>Systems in wet mountains of the Massif Central and Franche-Comté</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of French farms</td>
<td><strong>43 000</strong></td>
</tr>
<tr>
<td>% maize/MFC</td>
<td><strong>20-50</strong></td>
</tr>
<tr>
<td>Dominant type of grassland</td>
<td>Temporary grassland</td>
</tr>
<tr>
<td>LU/ha MFC</td>
<td>1.4-1.7</td>
</tr>
<tr>
<td>Milk produced (L/cow)</td>
<td>5 000 - 9 500</td>
</tr>
<tr>
<td>Milk (L)/ha MFC</td>
<td><strong>0.8-1.0</strong></td>
</tr>
<tr>
<td>Organic N pressure (kg/ha spreadable)</td>
<td>100-110</td>
</tr>
<tr>
<td>Nitrogen surplus¹ (kg/ha)</td>
<td>80-100</td>
</tr>
<tr>
<td>Organic P pressure (kg/ha)</td>
<td>20-22</td>
</tr>
<tr>
<td>Phosphorus surplus (kg/ha)</td>
<td>10</td>
</tr>
<tr>
<td>Direct and indirect energy consumption (MJ/1000 L milk)</td>
<td>2 685-4 296</td>
</tr>
<tr>
<td>Greenhouse gas emissions after integration of carbon storage on grasslands (Eq CO₂/L milk)</td>
<td>0.8-0.9</td>
</tr>
<tr>
<td>Pressure of plant health products (g/ha AA)</td>
<td>800-1 200</td>
</tr>
<tr>
<td>Biodiversity equivalent area (ares/1000 L milk)</td>
<td>18-22</td>
</tr>
</tbody>
</table>

¹: Nitrogen balance inputs – outputs at farm scale without symbiotic fixation

### Analysing and organizing work

The gap observed and felt between the time worked by farmers and the time worked by part of the active population only adds to the preoccupations of farmers about the problem of work. Faced with the legitimate demand for free time, the increasingly complex nature of the work and the evolution of the work collective, concrete responses must be provided to ensure that the farming profession can continue to attract prospective young farmers (Calland, 2009).

The approach to livestock farming work was initiated in the 1990s in the framework of the Livestock Farm Networks, which led to the working out of the "Work assessment" method in partnership with the INRA. This method was recently applied by other animal technical institutes (pigs and poultry).

Since 2010, new updated national "working time" reference systems, drawn from surveys carried out in 640 livestock farms which come mainly from the Livestock Farm Networks, are available for seven animal sectors (herbivores and granivores). They are sometimes coupled with more qualitative studies, as in the dairy cattle sector, on essential routine work (Chauvat et al., 2003). Similarly, regional use of these surveys has made it possible to propose markers of working times and annual programming of activities to make work organisation easier, as for sheep meat systems in Auvergne (Servière, 2005).

At the same time, "work" technical support methods and tools are constructed in collaboration with grassroots organisations, making it possible for example to provide markers for installation projects (in goat farming with “Conseil Travail Caprin” (Guinamard et al., 2010) or in beef cattle with Travibov (Sarzeaud et al., 2009).

### A recognized system which must continue to adapt

Variety of productions and heterogeneity of farms have long been presented as signs of the backwardness of French agriculture. However, the diversification of productions has also regularly been presented as a necessary condition for the adaptation of farms to market constraints (Colson, 1986). French livestock farms continue to follow two development strategies: specialisation or diversification. The Livestock Farm Networks system make it possible to study these systems, whatever their orientations, to study their strengths and weaknesses, and describe coherent livestock farms, with appropriate choices in the face of present-day issues. This diversity at territory or farm scale, emphasised by the systemic
approach, is not seen as a handicap but as a source of system flexibility and adaptation of French agriculture (Dedieu et al., 2010).

The Networks provide markers, formalise and give guidance to farmers when thinking about new themes, initiated by the farmers themselves or by the technical institutes, by agricultural development bodies, by society, the market and by the policies in force. Their capacity to anticipate is part of the reactivity of the Networks.

Identifying and studying all the technical innovations implemented in livestock farming is not always obvious, all the more so as the system, although representative of existing systems, is not exhaustive and obliges a selection to be made. On the other hand, experimenting new approaches (Life Cycle Analysis for example) on well-known farms is easier. Sometimes there is still the difficulty of transmitting these new developments to as many people as possible beyond the farms monitored. The dissemination of knowledge and innovations is however one of the missions attributed to the system. It is made easier when the economic or political context forces the surroundings of the livestock farm to look into it or when complementary projects are set up.

By relying on a strong partnership between a national technical institute for applied research and local development organisations established all over the territory, this system has built up its institutional legitimacy and has been able to use the skills and specificity of each organisation to make it such a valuable resource. This is strengthened by the men who make up the Networks. The skills available in the teams are varied and often complementary (multidisciplinary approach of the advice). The expertise of all these players also makes it possible to have qualitative elements on the farms and the territory that cannot be proposed just by databases.

This system is recognised and supported by farming professionals and public authorities. Its financing is regularly re-discussed, but, and this is a sign of its significance, several farming sectors want such systems to be extended to their own production. Another element of recognition, via the Programme of Options Specifically Relating to Remoteness and Insularity (POSEI), Europe supports the setting up of these Networks in the more distant European territories (New Caledonia, West Indies, French Guyana, La Réunion).

As we have seen, this system requires discussion and agreement and steering authorities. The governance method to be implemented is sometimes complex to manage as it is composed of numerous partners with sometimes diverging objectives which then require compromises to be made.

A criticism which is often made of the Networks is that their dimension and multi-partnership organisation can hinder their reactivity. And yet, it is towards this system that the professional steering committees turn to deal with questions in the news, for example via complementary theme investigations.

Satisfying their primary function of forming links between players, the Livestock Farm Networks are supports for many multi-partnership projects of French and European research, development and innovation (CASDAR invitation to tender), with several partner countries (Interreg, Mediterranean area) and participate in international think tanks (International Farm Comparison Network, Agri-Benchmark).

References


Review comments

Excellent paper showing the building, the main activities, the results and products of the Livestock Farm Network in the French context. It is a relevant tool, especially to analyze the trends of livestock farms, produce information for policymakers, develop interactions and strengthen partnership in the livestock sector. The high cost for the network is directly linked to its quantity and the quality of the products. No more comment.

3rd Reviewer

Report about the paper:
"Livestock Farm Networks, a system at the centre of French farming development"
by Carole Jousseins, Jocelyn Fagon, Julien Belvèze and Gérard Servière

The paper deals with a very important theme, focusing on issues as institutions, territorial organization, partnership, multidisciplinarity and systemic approaches, diversity, and innovation. It explores how these networks are used for farming development, reporting an application to livestock farming in France.

The paper is clear and well-written. Contains some figures and tables that help illustrate the arguments.

It is structured to explain the history of farmers' organizations in France; discuss the diversity of livestock production; explain the networks, their methods and coordination; their uses to lead to sustainable development; and, finally, the need of continuous adaptation.

I consider that the paper attends the requirements to be included in the book and I am favourable to its publication.