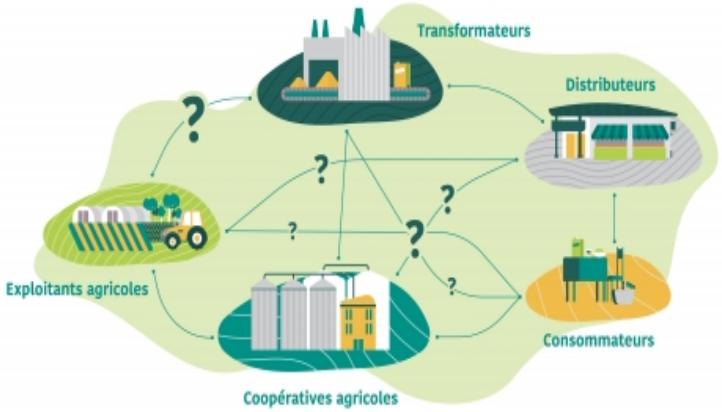
Link between innovative Agri-food firms and location in medium-sized cities of Occitanie



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Abstract

Previous studies agreed that the economic growth of a country is mainly driven by metropolitan areas and not rural areas. The use and the rescue of the territories must no longer be done in metropolitan areas like Paris, but there is a need to take advantages of all the territory, human, artisanal, location and history then adapt them with the needs by innovating.
This report is a continuity of a research done as part of a project “Repro-Innov” started in 2016. This study will focus on the innovation process and quality in medium-sized cities of Southwestern France based on 5 interviews and 24 answers to a survey with people working in Agri-food enterprises. It will also discuss the situation during the pandemic. The second step is to analyze the interviews and the survey using a quantitative data analysis. This study makes it possible to analyze the specificity of medium-sized cities and their differentiation factor. It also makes it possible to highlight the problem of distancing which impacts innovation and cooperation but also the cold chain and the quality of the product.

key words: Agri-food industry, innovation, quality, medium-sized city, interviews

Des études antérieures conviennent que la croissance économique d'un pays est principalement marquée par les zones métropolitaines et non par les zones rurales. Ce rapport est la continuité d'une recherche dans le cadre d’un projet “Repro-Innov” qui a commencé en 2016. L’usage et le sauvetage de nos territoires ne doit plus se faire dans des zones métropolitaines comme Paris, mais il faut profiter de tous les territoires, humains, artisanaux, de localisation et d'histoire puis les adapter aux besoins en innovant.
Cette étude portera sur le processus d'innovation dans les petites villes du sud-ouest de la France sur la base d'entretiens et questionnaire avec des personnes travaillant dans des entreprises agroalimentaires. Nous discuterons aussi la situation de ces villes pendant la pandémie. La deuxième étape consiste à analyser les entretiens à l'aide d'une analyse quantitative des données. Cette étude permettra d'analyser les spécificités des villes moyennes et leur facteur de différenciation. Elle permettra aussi de mettre en avant le problème de distanciation qui impact l'innovation et la coopération mais aussi la chaine de froid et la qualité du produit.

Mots clés : industrie agroalimentaire, innovation, qualité, ville moyenne, interviews

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Chapter 1: Introduction

Despite the development of rural areas and their policies, medium-sized cities are facing many challenges like the decline of the populations, loss of workforce, poverty and the rapid growth in the metropolitan areas. (Radhika Kapur 2019)
Slow-growing and shrinking areas might find that their policies are not bringing the prosperity they seek, while fast-growing areas at the edge of metropolitan regions face metropolitan-style development pressures. (Davezies et Thierry Pech. 2014)

The definition of a small or medium sized town can be defined in terms of the location and population. In France, they represent non-metropolized area in urban centers. (Christophe et al. 2013)

	Perspective of associations of elected officials	Perspective of researchers	Perspective of the State (DATAR)	National institute for statistics and economic studies (INSEE)
Small town	Municipalities of 2,500 to 25,000 inhabitants (Association des Petites Villes de France)	Urban centres of 5,000 to 20,000 inhabitants (Laborie, 1979; CERAMAC, 2003)	-	Urban centres of 5,000 to 20,000 inhabitants
Medium-sized town	Municipalities-centres of 20,000 to 100,000 inhabitants and united under EPCI (Fédération des Maires des Villes Moyennes)	Urban centres of 20,000 to 100,000 inhabitants (Lajugie, 1974)	Functional urban regions of 30,000 to 200,000 inhabitants (*Programme Villes moyennes*, 2005-09)	Urban centres of 20,000 to 100,000 inhabitants

Table 1. Definitions of small and medium-sized towns (Christophe et al. 2013)

Medium-sized cities occupy a specific place in the urban network. They participate in the industrial history of France. In 2000, they created the Medium-sized town contract. To be eligible as a medium town, there is a need to satisfy not only the demographic criterion but there is also the need to distinguish between rural and urban centers based on services and job commuting. (Christophe et al. 2013)
Even if the characteristics of a medium town are not well explored, all previous research agrees that the number of inhabitants must be between 100,000 and 200,000. But Levy et al. (2013) choose the definition used in the framework ESPON (2007: Cities with 20,000 to 100,000 inhabitants).

The agri-food sector is structured into the agri-food industries, the wholesale trade in agri-food products and commercial food crafts. These actors intervene to enhance agricultural production and play a decisive role in the regional economy.
In Occitanie, the agri-food sector represents approximatively 9,000 companies located on the regional territory. With a turnover in 2015 of 22 billion euros, this sector represents almost 14% of the weight of the regional market economy (except agriculture, financial services and insurance) and 23% of turnover in export. (L'agroalimentaire d'Occitanie 2018)

This report is a continuity of the project REPRO-INNOV: Productive reorganizations and innovations in the food industry financed by INRAE and Occitanie region. The project tries to understand how the actors of the agri-food chain are facing the current developments in the agricultural world, how these actors reorganize

themselves to adapt, how their respective areas of action are evolved and what is the impact of the territory on their development.
Using multidisciplinary approaches in the social sciences, the project tries to analyze the innovation processes underway within the sectors. This analysis is particularly interested in the relationships between upstream and downstream of these sectors and changes in the modes of coordination of actors. The goal is to better understand how innovations may or may not favor the transition to more sustainable food systems.

This study focusses on the innovation processes of agri-food firms located in medium sized cities. It is based on 5 interviews and 24 survey of agri-food firms located in medium-sized towns in southwestern France. The results were based first, on the excel analysis of the survey then on the text analysis of the interviews. We will explore the literature review on the importance of innovation and quality then we will compare different areas. Then we will present the methodology and finally, we will enumerate the results and the discussion.

Chapter 2: Literature review

Before developing the methodology, there is a need to better understand the issue of the project. The first part will focus on the innovation especially in the medium-sized towns, then, we tried to discuss further the importance quality and safety agri-food firms. Finally, we compared the different areas based on their advantages and disadvantages and summarized it in a table.

1. **Importance of innovation in agri-food firms located in medium-sized town:**

Innovation in the food industry serves to reduce the gap between the different regions of a country and rebalance them in terms of competitiveness.
Innovation can be seen as an important determinant of productivity and growth in agriculture and the food industry. But in the literature, the majority of work on open innovation focuses on large companies, the specific case of SMEs and emerging companies is overlooked. (Chesbrough 2003; Gandia, Parmentier et Schaeffer 2020)

The term open innovation was originally referred to a paradigm assuming that firms should use external and internal ideas to advance their technology. (Chesbrough 2003). We can name two kinds of open innovation: outside-in and inside-out. The outside-in part received special attention and it involves opening up to many kinds of external inputs and contributions. Inside-out allows unused ideas to go outside and be useful in other businesses. (Gandia, Parmentier et Schaeffer 2020)
It can be defined as a distributed innovation process exploiting knowledge flows both internal and external, in order to innovate inside and outside the organizational boundaries of the company. When a company combines internal and external resources and knowledge, it will go beyond the value of the company and extend to the ecosystem. (Gandia, Parmentier et Schaeffer 2020). Open innovation can offer multiple study possibilities which can considerably enrich the understanding of this phenomenon especially for SMEs.
When we think of open innovation, we think of large companies in the high technology sector for example. But innovation in small companies is as important as innovation in big companies. SMEs are the subject of growing support from local European policies, which encourage the development of innovation to increase the economic growth.

The agri-food industry is known as a slow growing industry and not enough investment in R&D. It is inevitable due to competitiveness and food supply and demand. (Global Innovation Index 2017: Innovation Feeding the World 2017)
Nowadays, consumers' demands are increasing; they need a unique food with a unique flavor or a special diet (sugar-free, gluten free…). This kind of need involves adopting new technologies or new business models. We can also mention nanotechnology or biotechnology offering new applications to respond to the needs of the contemporary consumers. (Zeroukhi 2017)
But innovation can be a difficult and complex process for the food industry especially in the urban areas. Innovation is an internal process but there is also a need to cooperate with external partners. We can take the example of the nanotechnology

that will be developed externally (Zeroukhi 2017). In the next part, we will enumerate the factors of innovation.

The reason for the decline in the innovation may be due to geographic isolation (García-Cortijo, Castillo-Valero et Carrasco 2019). Recently, it has been shown that innovation depends on regional factors. Certain factors such as teaching or researching may be less concentrated in these areas (Läpple et al. 2016). The poor research on innovation in these localities confirms that they have a weak interface which is necessary for innovation.
Another internal characterization of the regions is the great distances from the market, the rather limited supply and demand and their economy which is based on resources. Other factors may explain this low rate of innovation, such as the high costs, the size and the age of the company. However, these latter points differ from one source to another.
Another point is the lack of skilled labor (García-Cortijo, Castillo-Valero et Carrasco 2019). It is also necessary to take into account external factors and the environment of the company such as economic activity, proximity to the employee, customers and suppliers (Läpple et al. 2016).
Whatever the type of business, the decision to adopt open innovation has consequences for organization, practices, strategy, management, and the environment. One of the important limits of open innovation for SMEs, remains the lack of understanding of its dynamics of evolution. Even if some references highlight the functioning of specific processes, the analyzes focus more on the key stages of these processes and on the results. (Gandia, Parmentier et Schaeffer 2020; Global Innovation Index 2017: Innovation Feeding the World 2017).
But in agri-food business, innovation is important, but the quality of the products is a major point.

2. Importance of quality and cold chain in agri-food firms

After discussing the importance of innovation in agri-food industries, this part will focus on the importance of maintaining the cold chain and quality.
The cold chain is a series of actions and equipment applied to a product. The cold chain is important in agri-food firms and essential to the food sector. It delivers safe food, reduces food waste and improves food safety and security. It also allows us to maintain a perishable food product in the best condition by limiting the growth of bacteria. (Roset et al. 2002)
The cold chain goes from the initial product to the final product delivered to the consumer, from the transport to the storage. The temperature applied should be continuous from the production to the consumption. It is the responsibility of the producer, the consumer and the intermediates to maintain the continuity of the cold

chain from the production to the consumption. It is true that the cold chain helped to increase food safety but there is a need to be vigilant in the presence of microorganisms in all the chain because they can proliferate rapidly. However, electricity used for refrigeration processes has an economical and an environmental impact. And if the cold chain can go wrong, or the efficiency is not ideal for many reasons and can also cause environmental, economic and sanitary issues. (Roset et al. 2002; Coulomb 2008)

When the cold chain is not respected, the quality of the food is no longer maintained, and many microorganisms can be developed and can be responsible for toxi-infections and food-borne illnesses. We can list the main microorganism and their minimum development temperature (Roset et al. 2002)
-Salmonella (5°C), Staphylococcus aureus(5°C-12°C), Bacillus cereus (5°C), Yersina enterocolitica (1°C), E.coli 015:H7(5°C-12°C), Listeria Monocytogenes (1°C), Clostridium botulinum (3°C) and Clostridium perfringens (14°C)

Transport of food, especially when it is a long distance, is also responsible for a high percentage of the global emissions of climate change gases. It can also generate social hazards for example pollution and air and noise. The food mile should be minimized because of their effect on the environment. (Coulomb 2008)

It is estimated that post-harvest losses currently account for 30% of total production (Coulomb 2008). The production of food involves a significant carbon investment that is squandered if the food is wasted.
Energy required for the cold chain contributes to the production of CO2 and for climate change. Another point is the manufacture and loss of refrigerant that will also contribute to climate change. (Coulomb 2008)

After discussing the main problems of the cold chain, it is important to try to reduce the environmental impact or the money loss by using appropriate solutions. The packaging of certain food, especially frozen products must respect certain requirements: flexible and strong, protective against air and light. (Potter 1986) They should have a special impermeability because of the migration of water from surface of food to colder surface. The food will expand up to 10% of the total volume. Frozen foods will be thawed in their containers or packages should be liquid tight to prevent leaking on thawing. Many packaging materials such as waxed, foils, papers, can, and plastic films can be satisfactory, but we need more technologies to be sure of the safety of the product (Potter 1986).

3. Comparison of the areas

The industrial revolution has widened the geographic inequalities in the country. Based on Labrouche and Levy (Geoffrey et Levy 2019b, 2019a), I tried to summarize the differences between the 3 types of areas based on literature reviews and interviews:

	advantages	disadvantages
Metropolitan area	-Engines of economic growth - Agglomeration creates: Significant innovation performance/ create knowledge and growth -Diversity of inputs - Higher diversity in skilled labor - Reduction of transport costs - Skilled labor	-Agglomeration also creates exaggerate competition/ increase of labor costs and inputs - Higher costs related to congestion
Medium-sized town	- A compromise between advantages of metropolitan areas and rural areas example: presence of a good infrastructures and universities - Close to agricultural resources - A good connection with other countries - A good logistical network	- Lack of access to resources (external) - Lack of funding and public support
Rural area	- Advantageous to some sort of innovation - Close to agricultural resources - Pleasant living environment - Affordable and plentiful land	- Lack of innovation factors - Low R&D intensive sector because it depends on other resources

Table 2. The advantages and disadvantages metropolitan area, medium-sized town and rural areas

The medium-sized city can be defined as "an unidentified real object" and non-metropolitan zones. They have an important role in the life style thank to the quality of life, the real estate prices and the concentration of social life. (Bailly et Bourdeau-Lepage 2011).The medium-sized city is characterized by advantages linked to both the rural and the urban areas. However, rural benefits are more present and a number of criteria specific to medium-sized cities appear different from the previous ones
and not much mentioned in the literature. (Geoffrey et Levy 2019b)

Chapter 3: Materials and methods

The research method used in the project is the case study. It is a detailed examination of agri-food firms located in Occitanie. The sources of evidence are based on the interviews and the results of the survey. The challenging aspect of using case study research is to raise the research from a descriptive account to a useful study that can lay claim to being worthwhile. In the beginning, we tried to collect all the firms of occitanie and choose only the innovative ones and contact then visit them for a complementary interview. But after the pandemic and the lockdown, we changed our method and we contacted all the firms of Occitanie (innovative or not) by mail and messenger to answer a survey and if possible, to do a telephone interview.
Conversely, questionnaire surveys will weaken internal validity (responses
and favor external validity.
These two possible routes are generally assimilated to the distinction between qualitative approaches, where the number of respondents is limited and the deep analysis deep; and the quantitative approaches, involving a statistical study based on a large number of structured questionnaires. (Lugen Marine)

1. **Choice of medium-sized towns**

As defined before, a small town is a town with 20,000 to 100,000 inhabitants.
Here are the small towns in Occitanie:

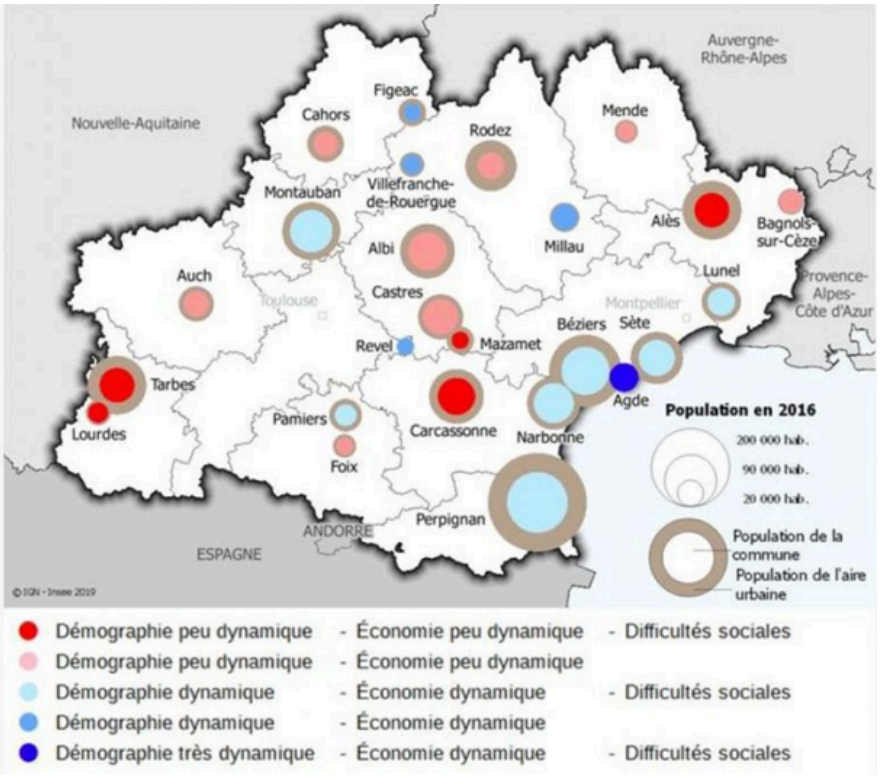

Figure1. Medium-sized towns in Occitanie (Doguet et Rodes 2019)

In the previous studies done by Labrouche and Levy, they selected 5 small towns (Alès, Cahors, Montaubon, Béziers and Rodez) in Occitanie based on the size and the function. But there are more small towns in Occitanie that we can scrutinize.
Based on the criterion, we added Albi, Auch, Castres, Millau, Tarbes, Carcassonne, Lunel, Narbonne, St-Cyprien et Sète.

2. Choice of the firms

We had the list of all Agri-food industries in all the medium-sized town of Occitanie with hundreds of firm names. I started to proceed by elimination: some of them were closed, others didn't have enough information on the internet. But the most important criterion is the innovation. The firms must at least contain one type of innovation. The most common innovation is product innovation for example a new product or an improved product. It can also be a process innovation such as a new distribution technique, an organizational innovation, a marketing innovation and finally an eco-innovation.
In the beginning, we focused on the 10 firms studied in the previous work and tried to find a new innovation and to decide whether there is a need to contact them or not.
Then, we selected 19 firms among the list and tried to find a way to contact them.

But as a second step, we have expanded our list, and contacted all the firms in Occitanie whether they are innovative or not. We contacted at least 200 firms, 23 of them responded to the survey and 5 of them accepted to do the phone interview.
The aim was to carry out a quantitative study by a questionnaire or interviews of a representative samples using emails and phone calls.

3. **Survey**

The questionnaire survey is a tool used to analyze and understand the market environment of a company. It is a methodological observation tool with an aim to obtain quantifiable and comparable statistical data on a specific and representative population. (Enquête par questionnaire)
The first task is to determine the object of study. The questions must be clear, feasible and relevant. (Lugen Marine)
We have two categories of questionnaire administration methods; the direct mode and the indirect mode. The direct mode is a QCM survey by phone or face to face and the indirect mode, the online questionnaire is the most used one because it doesn't cost a lot of money and is also instant and easy to use and to analyses. (Enquête par questionnaire)

We created a survey on Limesurvey. It consists of 4 main parts. The first part discusses the firm activity and market (respondent, firm activity, number of employees, type of contract, quality sign, etc.). This kind of questions helps to visualize and understand the climate of the firm.

The second part is about the innovation practices (main innovations, trajectory, objectives, cooperation, brakes, financing, patents, etc.). The third and most important part discusses the location in a medium-sized town (strengths and weaknesses of the location in order to innovate). And finally, the last part is about COVID-19 (activity, impact of localization on crisis management, specific devices, etc.). You can find in the end of the annex all the questions of the survey.

In total, 24 firms responded to the survey. We had all kinds of businesses: canning and cutting duck and foie gras, biscuit making, beer production, winemaking, winemaker, cellar, confectionery and pasta, chocolate, jam manufacturing, caterers, flour mill, industrial bakery, roasters, butchers, caterers, cooking, vinegar, condiments, smoking fish, salting, preparing ready meals. All the graphs are in annex from graphic 1. to graphic 20.

4. **Interviews**

The qualitative method can give the opportunity to study and analyses the firms and their environment.

In the end of the survey, we asked the respondent if they are you available for a brief telephone interview to deepen their answers to the questionnaire. And if they agree, they have to leave their mail or phone to contact them and set up an appointment.
5 firms accepted to do the interview. We conducted 5 interviews in 5 companies in different medium-sized towns of Occitanie but only one firm had an open innovation. Some of them innovate and others don't innovate at all. The questions were specific for each firm based on their responses on the survey. The aim of the interviews is to have more details on their innovations and how they handled the pandemic.

In total, 5 interviews with an average duration of 22 minutes were the shortest interview lasted 9 minutes and the longest 50 minutes. They were carried out the 4 and 5 may and the 25 and 26 may. They were all conducted in French with managers except one with a quality manager.
The semi-structured interviews were recorded then transcribed. They were encoded then analyzed. The results will be discussed in the next part.

Chapter 4: Results

First, we wanted to classify the companies according to the number of employees.
French regulations distinguish micro-enterprises or very small enterprises that have less than 10 employees, small and medium-sized enterprises from 10 to 249 employees, intermediate-sized enterprises which have between 250 and 4,999, and large companies with 5,0001.

Graphic 1. Classification of the firm according to their number of employee (French regulation

If we would have chosen to study only the SMEs, we would have had a total of 7 companies only. We therefore decided to consider all the businesses (from micro-business to large businesses).

Graphic 2. Type of market (local, national or international)

Among the 24 firms, 25% of them have the 3 type of market. The companies target equally the local and national market (71%). However, the international market represents only 67%

Graphic 3. Type of transaction (B2B, B2C or both)

B2B marketing concerns trade between one company and another and B2C marketing concerns trade with private customers.
55,5% of the firms are Business to Business, 48,15 are Business to Consumer and 48,15 are both B2C and B2B. B2B exchanges slightly exceed B2C exchanges; a difference of 7.35% (2 companies).

Only 40,9% are member of a competitiveness cluster or professional association (11 firms)

Graphic 4. Trajectory of the innovation of the firms in the 10 years

The number of companies innovating including companies with a stable trajectory and an increasing trajectory: 24 companies. 5 companies have no innovation.

Among the 38% of companies with an increased innovation trajectory, only 2 of them protect their innovations. None of the 48.15 companies with a stable trajectory protect their innovation.

In this part, we will only interest in the 80% of innovative firms (19 innovative firms).

Graphic 5. Type of the innovation introduced in the firm

Companies can choose from one to three types of innovation. The innovation that received the most response was a new or improved product type innovation with 68%.

The codification of the interviews focuses mainly on the type, the determinants and barriers of innovation. We coded according to table 3.
But since the question focuses on open innovation, we only encoded the firm with open innovation. We used information from both the survey and the interview.

	Characteristics	Number of references
Type of innovation	T7- Open innovation	3
	T1- Product	3
	T2- Process	1
Determinants	D3- Differentiation	2
	D1- Answer to market demand	2
	D2- Problem solving	1
	D4- Entrepreneur's idea	1
	D7- Cost reduction	3
	D9- Monitoring, lack of information	2
	D8- Environmental concerns	0
Barriers to innovation	F2- Time	1
	F4- Competencies	1
	F6- Technical problems	2
	F5- Public support	1
	F1- Supply	1

Table 3. Analysis of the interview and the survey of the firm with an open innovation

I also tried to enumerate all the innovations with their description in table 4.

Table 4. Type of innovation and description

We also tried to summarize all the interviews according to the 4 different parts in table 5.

Table 5. Abstract interviews: innovation part

According to table 5., the major brakes of innovation are having enough money, resources or time and sometimes it's not even a necessity. But when they innovate, they do it for the identity, to attract the consumer by changing something in the product (new component, facility the use, change the packaging, the flavor …). Some of them try to cooperate to develop their innovations to save money, time and solve a lot of problems. Others try not to cooperate because it means sharing their recipes with other people, so it becomes hard to keep their capital and secret.

Graphic 6. The goals of the innovation introduced in the firm

According to graphic 6, the highest common objective of innovation is to expand the range with 63% then in 2nd place with the same percentage 58, we find to conquer new markets and differentiate itself.

Among the 24 firms, only 16% (4 firms) of them cooperate for their innovation. In this part, we will only be interested in the firms that cooperated for their innovation.

Graphic 7. The cooperation actors of the innovation

All the firms have cooperated with companies in their industry, half with customers and only one with suppliers. A single company has cooperated with the 3 players to develop their innovation.

Graphic 8. Ways of finding partnership for the innovation

All the companies used their personal network to find their partner. Only one company also used the internet, and another also used showrooms.

Graphic 9. Means of financing the innovations

90% of companies finance their innovation by their own means and 21% have used European Union funds such as ERDF, ESF, PCDR ...

Graphic 10. The part (%) of the budget allocated to innovation

39% of the firms allocate <5% of their budget to the innovation, 38% of the firms allocate 10% of their budget to the innovation and finally 24% allocate >10%.

Graphic 11. Barriers to innovation

The most important brake with more than 50% is the lack of time. After that, there will be the lack of money with 37%. We can therefore conclude that the most important obstacles are not linked to the location of the company.

Out of 19 firms, 63% of them have a quality sign. Now, we will only be interested in the 12 firms with a quality sign. The quality sign can be supervised by many devices:
[French system: Red Label, Organic Agriculture, AOC, Farm or Mountain Product, Product Conformity certification, Reasoned Agriculture]
[European system: PDO, PGI, Traditional Specialty Guaranteed]
[Normative procedures: NF ISO 9001 or NF ISO 14001, Agri Confiance]

Graphic 12. The different type of procedures used for the implementation of the quality sign

Most companies (75%) have been supervised by a French system to implement their sign quality. 25% of the firms have been supervised by an European system and 8% by a normative system.

Table 6. Abstract interview: quality sign part

It is true that quality sign is important, but we have two types of sales; The short circuit or the direct selling which is a transaction without intermediary between the producer and the buyer. In this case you can manage to sell your expertise by explaining the work. So, in this case, the certification is not a necessity especially when the producer can't amortize the expenses. But when you sell your product on the market, you are not in contact with the consumer, so you have to fight on an equal term and try to reassure and help him make a choice.

The next part will be about the location. I wanted to discuss the problem of maintaining the cold chain especially when there is a long distance. It is only the case of factories with refrigerated products. When your product will browse a certain distance with a defective refrigerant or where the temperature is not respected, there will be many problems explained in the literature review. For that reason, we asked a question related to the transportation of cold supplies:

Maintaining the cold chain is important, have you ever encountered long-distance transport and distribution problems that you would attribute to your location?
Out of 21 companies, 13 of them have fresh products. Among these companies 5 (38.5%) faced a cold chain problem during distribution. Here we can conclude that long distance transport and distribution is important for companies with fresh produce. Being located far from distribution chains or metropolises can be a disadvantage of being located in a medium-sized city.

Table 7. Abstract interview: Location part

Before talking about the innovation, we asked them about the reason for choosing their location. For some of them, it wasn't really a choice, their family made the choice for them. One confirmed that it was because of the inexistence of competitors. Another one needed a large area which is not easy to find in a big city.

Another problem of being in a medium-sized city, is the number of operators nearby. To innovate, there is a need to research and develop, but the long distance between laboratories, for example, can be costly. There is also a need for resources which is not easy to find.

But there are many other differentiating factors like the good quality of life, good connections in terms of communication networks and traveling. They also have a low real estate pressure and a geographical opportunity; Not far from mountains not far from the sea with an ideal plantation. There is also a proximity of a lot of leisure resources.

Graphic 13. Advantages of a location in a medium-sized city for a business

In first position, we find proximity to nature and pleasant living environment and the possibility of promoting local products with 46% and then the facility to access the market.

Graphic 14. Disadvantages of a location in a medium-sized city for a business

About half of the companies (46%) consider that the lack of human resources is one of the disadvantages of being located in a medium-sized city. Then with 33%, we find the sparse network of actors.

Graphic 15. Impact of the covid-19 on the firms

Companies can choose from one to three impacts. The pandemic has affected business activity with 77% by lowering the activity and then demand. In second place, we can find with 68% the change in the work organization by implementing new security measures. With 18%, the modification of the work process, 9% closed their business, 9% think that the pandemic had no effect and finally 4% changed their production process. We can note that only one company has had an increase in the activity and demand.

Graphic 16. Impact of the location in a medium-sized city on the management of the crisis of covid-19 compared to a metropolis

Half of the firms believe that being in a medium-sized city has no impact on the management of the crisis. 27% think that location can have a positive impact and 23% think that it can have a negative impact. In the next section, we will look separately at the factors explaining the positive or negative effect.

Graphic 17. Factors explaining the positive effect of the location on the management of the crisis

Here, we will only focus on the positive impact (27%) and the factor explaining these effects. Of the 6 companies that seek that their localization can have a positive impact on the management of the crisis; 1 didn’t answer and 2 of them think that this

effect is due to social cohesion. We can also cite as factors of facilitated collective initiatives, social and home delivery.

Graphic 18. Factors explaining the negative effect of the location on the management of the crisis

Here, we will focus on the negative impact (23%) and the factor explaining this effect. The factor chosen by the most companies (4) is the problem of national policies which are poorly suited to medium-sized cities, then we can find with 3 companies the difficulty of communication (internet) and the small size which does not allow effective policies. Finally, with 2 companies each, we find the difficulty of getting around easily (transport) and the lack of vision and identity of the city.

Graphic 19. Specific measures done by the city (urban community) during the pandemic

Here, companies have chosen one or two devices put in place during the crisis. We note that 59% of companies responded that their cities didn't put in place any particular device. 23% of businesses have been helped by the city, which has set up business support systems. 9% of companies have no information about the devices.
We asked the respondent if their firm is involved in a local initiative to help people during the lockdown. Among 22 firms, 40,9% (9 firms) were involved in local initiative. Here are some examples: donation of gloves, masks or products to hospital staff, selling farm products, offering chocolates to the community nursing home and selling in the premises common farm products sold on the full wind markets.

Table 8. Abstract interview: pandemic part

From this table, we can conclude that during the crises, all the cities have the same rules and policies, so they are all supposed to manage the crisis in the same way.

But being in a small-sized city can be an advantage during the pandemic due first to the better climate and more fresh air then due to natural social distancing because of larger areas and houses (less crowded). Another advantage is the strong social connection between neighbors.

We asked a question about the social bond between the inhabitants, whether it is stronger in their cities or in the metropolises. On the 16 firms, 81,25 responded that the bond is stronger in their cities.

Graphic 20. Is the social bond between the inhabitants an advantage or a disadvantage during the pandemic?

Out of 14 companies that answered this question, 10 of them (80%) confirmed that the social bond between the inhabitants represents an advantage to manage the pandemic. 3 companies responded that it has no effect and one company responded that it is a disadvantage.

Chapter 5: Discussion

With more than 52,000 salaried jobs and 8965 agri-food firms (majority in rural areas), the food industry is a decisive sector in the region of Occitanie offering jobs outside major cities. The turnover generated by the agri-food industries represents more than 25% generated by all regional manufacturing industries. All of this can confirm the weight of the agri-food industry in the rural economy and their efforts to adapt to current developments. Household consumption patterns and purchasing habits deeply challenge the distribution model. Faced with these major developments, the anticipation of industries to adapt and conquer new markets must be strengthened. (L'agroalimentaire d'Occitanie 2018)

1. **Innovation and location**

It is true that metropolitan areas are characterized by higher innovation rates but we can suppose according to the result of the survey, the type of innovation that received the most response in the survey was a new or improved product type innovation, that maybe some of the firms have at least one innovation but they are no aware of it. And we asked some of the firms about their own definition of the innovation, they focused on the traditional measure involving necessarily R&D and a new process or product. We can talk here about hidden innovations. Some innovations are tangible like creating a new recipe or a new product. Others are not tangible and immaterial like new methods of organizing and both are important.
Another important point is environmental innovation. Rural areas are supposed to develop and innovate using agroecology and natural resources. They are considered as an eco-innovative area but according to the survey and the interviews, it is not always true.

Rural exploitation doesn't have a relative autonomy as a decision-making unit in production and technology and its interdependence is connected to the development if social connection city-country. The different activities and task of farming such as technical services or supply of production factors are dispersed and mainly in the urban areas.

The development of rural agri-industry is facing a new context. First, agribusiness faces the persistence of rural poverty in the areas where it was supposed to help reduce it; second, it must develop in a context marked by globalization and the increased competition from large firms in the food industry. Rural Agri =-industries

must therefore find new sources of competitiveness. (Boucher, Carimentrand et Requier-Desjardins 2009)

Policies to support the development of rural agri-firms put the increase in the incomes of small family farmers at the forefront. The aim was to increase their share in the added value by processing and marketing local agricultural production and to create jobs in rural areas. They are therefore defined as policies to fight poverty in marginalized rural areas, with a view to sustainable human development (Boucher, Carimentrand et Requier-Desjardins 2009)

2. **Food miles**

The concept of food miles is the distance that the food crosses before arriving to the consumer. It will go from the cultivation to the processing to the final to point of sale. It is a geographic distance that will contribute to the total greenhouse emissions. But here, we will focus more on the quality of the food. (The conscious club 2019)

The idea here is to eat fresher, local and more nutritious aliment. The aim is to first keep the money in your community and then to ensure a healthier and safer food. We can combine the desire to preserve the environment with protecting yourself from food shortages. The prices will go down, the nutritional value and the quantity will go up and the environment will be safer. (Lewis et D. Mitchell Andrew 2014)

3. **Pandemic and location**

With the appearance of the virus followed by the confinement, the desires of a good quality of life and a great outdoors of the French people have been exacerbated. Many of them decided to take the road and quit big cities for their second houses. According to the operator Orange, they would be close to 1 million to have left the Paris region during the confinement and according to Seloger.com, “the consultation rate of houses for sale has exploded” and property searches in the provinces have increased by 5%. (Lucie Oriol 2020)
The "urban exodus" can be explained by the affordable land, less pollution, less population density. Experts indicate that medium-sized cities have resolutely a card to play in the context of the virus. The evolution of the digital during this crisis is a great novelty compared to the previous crisis. When we say digital, we are talking about digital proximity replacing the physical proximity thanks to telecommuting. Medium-sized cities are an ideal place between nature and big cities offering easier access to short consumption circuits a trend that gained momentum during confinement.
However, it is not guaranteed that digital can meet all needs in terms of culture, leisure, education, health or transport.

Rural areas must further strengthen our short agricultural circuits to reduce our dependence and strengthen our food security. Likewise, this crisis has underlined the absolute need to make our community health organization more just and more efficient.

Chapter 6: Conclusion

It is true that medium-sized cities are considered in France as a key component, but they are still suffering from many problems and difficulties that will impact on the efficiency of development of some firms. We can mention difficulties in the competitiveness, adaptation or economic growth. The low density of business can be a major problem to access resources and knowledge. But sometimes the challenge can become a motive to innovate. The firms located in medium-sized cities with distance challenges forces them to maintain competitiveness by innovating and finding solutions to their problems. The globalization and the technological advances are also transforming these areas.

The aim of innovation is to produce new knowledge, to identify new skills, to give new skills to those involved in rural development through the actor-researcher partnership and innovation. Innovation is a must for rural areas and non-rural areas and the capacity of a region to innovate and learn is crucial for economic activities, development and competitiveness. But the lack of services, the geographic isolation and the unemployment of the rural areas can engender an economic decline; it is a vicious cycle.

Another point is that consumers are more and more exigent and demand an amelioration of the food quality and safety. They are also more oriented to the local and organic food. All this requires an innovative food process and a good understanding of the consumer needs.

There is also a relation between innovation and natural resources in rural areas and it is enhanced by the rural resources and the sustainable technologies. These technologies create renewable resources and political interest.

A transformation is fundamental because the rural areas represent an important percentage of the land and also because they represent the development and the growth of the economy and the environmental equilibrium

Solutions exist such as the development of remote services, i.e. the delocalization of immaterial activities. A ‘distance-neutral’ infrastructure for example can help rural areas with a need to invest in virtual connectivity.

The government should give more attention to the development of innovation in rural areas. Policymakers should concentrate more on the innovations activities by admitting the growing rural economy powered by the innovation. Local authorities also have an important role to play by creating, for example local policies helping people starting new businesses.

This internship was very rewarding for me, because it allowed me to discover rural economics, productive reorganizations and importance of innovations in the food industry, its actors and its constraints. It allowed me to participate in a project about food industry evolution in rural areas through the missions. I discovered a new world of territorial dynamics, economic activities and rural areas.

What I have learnt from this experience, is that it is important to eat locally; you will cut food miles and preserve food safety and quality. By supporting local farmers, you will also help to preserve the environment. The pandemic also confirmed the necessity to produce and consume locally. Every city should be self-efficient.

"We must highlight the extraordinary chance that France has of having several thousand small and medium-sized cities. The great lesson of the pandemic will be their valorization"

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