PATHWAYS OF INCORPORATION OF YOUNG FARMERS INTO LIVESTOCK FARMING

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ABSTRACT

The livestock sector in Europe is currently undergoing multiple transformations. The challenges posed by these changes must be faced by an increasingly aged workforce. Promoting the incorporation of young farmers into the livestock sector would be crucial for ensuring that these challenges are met in the best possible way. It is generally agreed that young farmers face these challenges with greater dynamism, flexibility and adaptability. In spite of this, young people have to face many difficulties when trying to join the livestock sector. This study analyses different ways young farmers experience the process of incorporation into the livestock sector in one of the main livestock regions in Spain (Catalonia). The Q-Methodology was used to identify five pathways: the Traditional pathway, the Neo-rural pathway, the Business pathway, the Industrial pathway and the Agroecological pathway. The fact that these five pathways coexist evidences the complex and multidimensional nature of the process of incorporation of young livestock farmers into the sector. Finally we also observed that the incorporation of young livestock farmers, its possibility or impossibility, and the pathway followed by them, are largely conditioned by five main drivers: (i) the presence or absence of an agrarian family tradition; (ii) the capacity to access adequate land; (iii) the education level; (iv) the degree of innovation in livestock activities; (v) the degree of autonomy in decision-making.

Keywords: New entrant, Farm succession, Discourse, Generational replacement, Q methodology.

1. Introduction

The livestock sector of the European Union (EU) is currently undergoing numerous transformations, namely: (i) integration into a global market in which European livestock competes with countries with lower production costs (EC/COM, 2011); (ii) adaptation to the changes included in the new Common Agricultural Policy (CAP) (López-i-Gelats and Tàbara,

2010; EC, 2017a,b,c), which incorporate even greater demands with respect to the environment (Milne, 2005, EC, 2017b) and animal welfare (Jacques, 2014; Eurobarometer, 2010); (iii) adaptation to new social demands about the future role of the livestock industry (López-i-Gelats et al., 2009; Eurobarometer, 2010; DARPA, 2015; EC, 2017c). At the same time, young farmers face new expectations about their role in a rural environment (Stock and Forney, 2014). Furthermore, the livestock sector has to face an internal demand for meat that is stagnating in terms of quantity, but which is increasingly demanding in terms of safety and quality (Delgado et al., 2001; EU SCAR, 2013). All this is happening in a context in which the rural economy relies heavily on outsourcing (Phillips, 2005; Sutherland, 2012; DARPA, 2015), and the active agricultural population is aging rapidly, a particularly acute trend in the livestock sector (Eurostat, 2014; Eurostat, 2016). This trend is particularly serious, as there is growing evidence of the greater dynamism, flexibility and adaptability of young farmers (Tuyttens et al., 2008; Grubbström et al., 2014; Koutsou et al., 2014; Sánchez-Zamora et al., 2014).

The age structure of workers in the livestock sector varies considerably between EU countries. There is a very significant imbalance between young and elderly farmers in countries such as Portugal, Cyprus, Italy and Slovenia, being the percentage of the formers much lower (Zagata and Sutherland, 2015). The ageing rate is notable in some countries. In the case of Spain, the percentage of farmers under 35 years old comprises 3.7%, while 6.0% is the average value in the EU. This figure is even lower in the livestock sector, in which only 2.9% of the workers are less than 35 years old, being 5.7% in the EU. The percentage of farmers over 65 years old is 33.3% in Spain and 31.1% in the EU; but 41.3% considering only the livestock sector (50.0% in the EU) (TCE, 2017). These data indicate that ageing is more noticeable in the livestock sector than in the agricultural sector, what suggests either greater difficulty or lesser attractiveness of livestock sector compared with crop farming.

The specialized literature points to the existence of a series of elements that explain the complexity of incorporating young people into the livestock sector (Darnhofer et al., 2016; (Brandth, 2002; Contzen and Forney, 2017), namely: (i) livestock farms require daily management and care of animals, which makes it difficult for farmers to enjoy holidays or holiday periods; (ii) they require higher investments, both for livestock and facilities; (iii) home and work tend to be co-located in livestock farms, which generates codependency; any alteration to the detriment of the family structure involves a change in the workforce and the productivity of the farm; (iv) the role played by women in livestock farms tends to be defined by farm owners, who

prefer to hire men and tend to exclude women, preventing the latter from becoming familiarized with the work required by livestock farms.

There is an ever-growing consensus that the lack of generational replacement is one of the main challenges faced by the European livestock sector, while also recognizing the complex nature of the process of incorporating young people to the workforce of the livestock sector (Monllor, 2013; Grubbström et al., 2014; Mishra and El-osta, 2007; Borec et al., 2013; Banovic et al., 2015; Rovný, 2016). Several groups of drivers have been identified as the main determinants of the process of incorporation of young livestock farmers into the livestock sector; some of them act at the farm level and some at the rural community level.

At the farm level, the main elements described in the specialized literature that are picture as having an influence on the process of incorporating young people into the livestock sector are: (i) belonging to a family with an agrarian tradition (Joosse and Grubbström, 2017; Kontogeorgos et al., 2014; Banovic et al., 2015); (ii) being attached to a specific agrarian identity (Cheshire et al., 2001); (iii) the importance of the role of women in the work required by the livestock farm (Brandth, 2002); (iv) thinking of agrarian activity as something more than an economic activity (Stenholm and Hytti, 2014); (v) the existence of a balance between the emotional ties to family and tradition and the commercial objectives of the livestock farm (Grubbström et al., 2014); (vi) the presence of young livestock farmers and their role in decision-making and farm management (Stock and Forney, 2014); (vii) the existence of physical assets such as land and infrastructure, as well as intangible assets such as knowledge transferred both before and after the generational replacement process (Lobley, 2010; Grubbström and Sooväli-Sepping, 2012; Price, 2012); (viii) the formal and informal social capital that is transferred to generational successors, such as participation in organizations (e.g., cooperatives, producer groups, associations, clubs, etc.) or trust relationships with other producers (Koutsou et al. al., 2014).

At the rural community level, the elements described by the specialized literature conditioning the process of incorporation of young livestock farmers into the livestock sectors are as follows: (i) the abandonment of land caused by low income being generated by livestock farming, advanced age of the farmer, remoteness from the consumption centers, difficulty of access to the farm, and/or low population density in the surroundings of the farm (Corbelle and Crecente, 2014); (ii) the increasing difficulty of making lands productive (Darnhofer et al., 2016); (iii) the decreasing availability of trained labor (Williams and Farrington, 2006); (iv) changes in the profile, interests and sensitivities of the inhabitants of rural regions (Sharp and Smith, 2003;

Zasada, 2011; López-i-Gelats et al., 2009); (v) the role of innovation in the development of rural areas (Esparcia, 2014), and the role of new local and regional actors in the governance of territorial innovation systems (Guillaume and Doloreux, 2011); (vi) the services linked to agricultural businesses, such as input suppliers, technical veterinary services and financial advisors (Mishra et al., 2010; Moragues-Faus, 2014); (vii) the intervention of "vertical" networks in product chains and the presence of networks of actors linked to standardized forms of production; (Murdoch, 2000); (viii) the existence of rural inter-industry networks such as integrated production systems (Bassi et al., 2014). The performance of each driver also depends on: (i) the socioeconomic environment - for example, the rate of unemployment generated by the financial crisis, reached 23.0% in Catalonia (2013) and more than 50.0% among young people (EC, 2013), thus unemployed young people saw in rural areas an alternative source of work, and the traditional workforce was replaced with new, often young labor, coming from other sectors, both urban and rural (Bertoni and Cavicchioli, 2016); and (ii) the political environment - for example, the Common Agricultural Policy and the implementation of agricultural support policies, such as direct aid and basic payments, which favored large farms having a detrimental effect on the exit rate of farmers (Mishra and El-osta, 2008). Similarly, the promotion of diversification of activities, such as rural tourism (López-i-Gelats et al., 2011; López-i-Gelats et al., 2015; Mc Fadden and Gorman, 2016), and the implementation of agro-environmental policies (Paniagua, 2000), led to changes, including abandonment, in the activities related to livestock farms.

The rural world is evidently undergoing a deep process of social and economic recomposition. These transformations are forcing the livestock sector to adapt to increasingly complex conditions. The present study is based on the hypothesis that there exist various ways to experience the process of incorporation of young livestock farmers into the livestock sector. Different pathways reflect the different motivations and strategies followed by young people when joining the sector workforce. Each of these pathways is the result of diverse experiences and interests, and at the same time each pathway tries to impose its own explanation and agenda. However, little attention has been paid to analyzing the diversity of these different experiences or the main conditioning drivers and motivations faced by young livestock farmers during the process of incorporation. This work uses the Q methodology (Barry and Proops, 1999; Van Exel and Van de Graaf, 2005) to identify different pathways being experienced by young livestock farmers in the process of incorporation into the livestock sector.

2. Material and methods

2.1. Study area

The study was carried out in the Catalonia region (Figure 1). This region is characterized by its high population density (232 inhabitants/km^2) and the presence of powerful industrial and service sectors, in which the agricultural sector represents only 0.9% of the regional GDP. Located in northeast Spain, Catalonia has a rich geographical diversity, with 580 km of coastline and elevations that range from sea level to 3,000 m.a.s.l.; the resulting climate is very diverse. The coast and low inland areas have a Mediterranean climate, with mild winters and hot, dry summers. As elevation increases, mainly in the Northern Pyrenees region, which borders France and Andorra, the Mediterranean climate gradually gives way to Atlantic climate and alpine and boreal climate in the highest peaks (Thuiller et al., 2003).

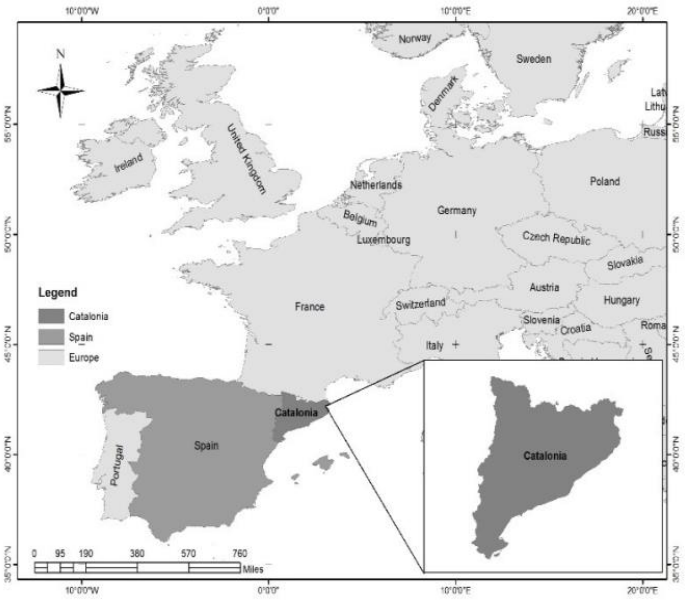
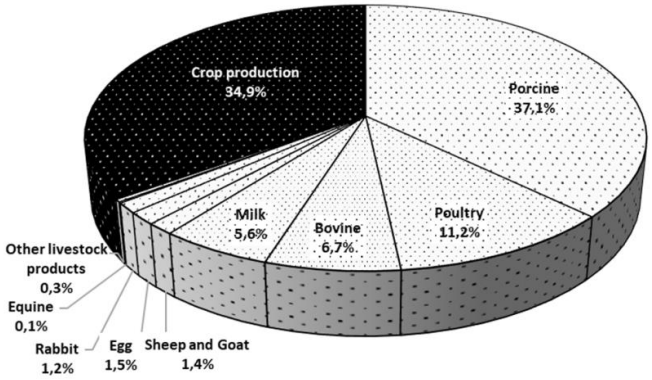


Figure 1. Map of the study area in Catalonia (Spain)

Twenty-six percent of the Catalonian surface is used to grow crops, while 64.0 % are forest areas and scrubland. Agricultural production is divided into extensive irrigation agriculture, occupying 70.0% of the agricultural surface, and intensive irrigation agriculture, which occupies the remaining 30% (MAPAMA, 2016). In Catalonia, crop production represents about 35.0% of all agricultural revenue, while the livestock sector contributes the remaining 65.0%. The strength of the livestock sector is explained mainly by the pork and poultry industries, which uses intensive production methods and contribute 37.0% and 13.0% of the agrarian revenue, respectively (Figure 2). The bovine, sheep and goat industries, which are less economically important, contribute to

the preservation of biodiversity and traditional landscapes; they also help stabilize the population and diversify the economy of rural areas. These species of ruminants are spread throughout the whole Catalonian region, mainly in the mountainous area of the Pyrenees. Catalonia contains 11,927 livestock farms, 5.6% of all the livestock farms in Spain (INE, 2017). The average useful agricultural area of Catalonian livestock farms is 19.6 ha; 24.5% is under intensive exploitation and 54.7% under extensive exploitation (DARPA, 2015).



Source: (MAPAMA, 2016)

Figure 2. Composition of agrarian revenue in Catalonia in 2014.

2.2. Data Collection and Analysis

An analysis of discourses was carried out to identify different perspectives about the process of incorporation of young livestock farmers into the livestock sector in Catalonia. This was conducted using the Q Methodology. This methodology was developed in the field of psychology by William Stephenson (1935, 1952) in the 1930s to delve into the subconscious of patients in a structured way. Its use has increased in recent years as a way to study the diversity of opinions and experiences about conflicting issues (Barry and Proops, 1999). Its use has extended to the fields of natural resource management (Barry and Proops, 1999), food policy (Mandolesi et al., 2015), land use policies (Zasada, 2011; Kvakkestad et al., 2015), agricultural production systems (Brodt et al., 2006; Pereira et al., 2016), and rural development (López-i-Gelats et al., 2009; Zabala et al., 2017). However, it has never been used to characterize different experiences about the incorporation of young livestock farmers into the livestock sector.

The Q methodology combines quantitative and qualitative techniques and allows to perform a statistically rigorous analysis of the participants' perceptions, while reducing the researcher's bias

by giving participants a decisive role in the definition of the categories that will be used to understand and interpret their opinions (Robbins and Krueger, 2000). The Q methodology is an efficient instrument to identify the diversity of discourses that coexist to make sense a given issue. However, it does not inform about what specific proportion of the population stick to each of them. A Q analysis requires sample sizes relatively small, since the units of analysis are opinions instead of individuals, and the point when adding an additional participant does not mean increasing the variety of opinions being included in the analysis is soon reached. The participants are not chosen randomly but to maximize the diversity of opinions and experiences on the issue at stake. Barry and Proops (1999) claim that samples as small as 12 participants provide statistically significant results. In the selection of participants, we included the following profiles: agriculture experts, researchers, agriculture teachers, young livestock farmers, young livestock farmers in training, representatives of farmers associations, and government officials (Table 1).

The Q analysis was implemented in five steps. First, identification of the discursive area. In this case the incorporation of young livestock farmers into the livestock sector in the region of Catalonia. Second, generation of a pool of statements through semi-structured interviews to the chosen participants. A total of 219 statements were collected from the interviews conducted to the 24 selected participants. Third, we then selected 36 statements that represented the maximum diversity of possible opinions among the total of those expressed by the participants. To guarantee that those 36 statements were accurately representing the diversity of opinions expressed, they were classified in terms of their association with the sociocultural, economic and political spheres. Fourth, a second round of interviews was carried out with the same 24 participants where each of them ranked the selected statements on the scale 'Most agree' to 'Most disagree' to produce a Q sort per participant which, it is assumed, represented accurately their positions. They were asked to arrange the 36 statements into a pre-designed grid (Figure 3), indicating their degree of agreement with them. Participants were asked to assign equal numbers of statements to positive and negative scores, and more statements to neutral and moderate scores than to the extremes, in order to facilitate statistical analysis. The two rounds of interviews took place between January and June of 2016. The interviews lasted approximately 45 minutes and were conducted in person. Fifth, the diverse Q sorts generated by the participants were statistically analyzed and grouped into ideal classifications (ideal Q sorts) through the extraction of factors. These ideal Q sorts were assumed to concentrate the essence of the different groups, and were interpreted as pathways. It should be noted that these pathways are not directly associated with specific participants, but

represent 'pure' versions of different ways of experiencing the incorporation of young livestock farmers into the livestock sector (Stephenson, 1952). The interpretation of the factors as pathways is based on the relevance and relative position of each statement (Zabala et al., 2017). There exist several methods to select the factors that should be extracted. In the present work, the factors selected were those on which the loading of two or more participants was significant ($p<0.01$), and which had an eigenvalue greater than 1 (Van Exel and Van de Graaf, 2005). After considering different options, a Principal Component Analysis (PCA) with a Varimax Rotation turned out to be the statistical technique that explained the greatest variance (75%). The software PQMethod 2.35 (Schmolck, 2014) was used to carry out the statistical analysis, and the qmethod package to create graphical representations (Zabala, 2014; R Core Team, 2016).

Table 1. Description of the participants

Participants' nature	Number	Gender	Age	Domains
Agriculture teachers	7	2 Female 5 Male	2 (30-49) 5 (50-69)	Livestock production (4) Crop production (2) Ecological production (1)
Agriculture expert	4	1 Female 3 Male	4 (30-49)	Territory and peasantry Agroecological and peri-urban Agrarian dynamization Agriculture and livestock
Producers	4	2 Female 2 Male	4 (30-49)	Extensive livestock farming Dairy sheep Sheep shepherd Agroecological tourism
Researchers	3	1 Female 2 Male	3 (50-69)	Sociology Agrarian economy Rural development
Government officials	2	2 Female	1 (30-49) 1 (50-69)	Incorporation policies Support in the rural sector
Representatives of farmers associations	2	2 Male	1 (30-49) 1 (50-69)	Association of young farmers Sheep and goats
Young livestock farmer in training	2	1 Female 1 Male	2 (18-29)	Incorporation process
Total	**24**	**9 Female** **15 Male**	**2 (18-29)** **12 (30-49)** **10 (50-69)**	

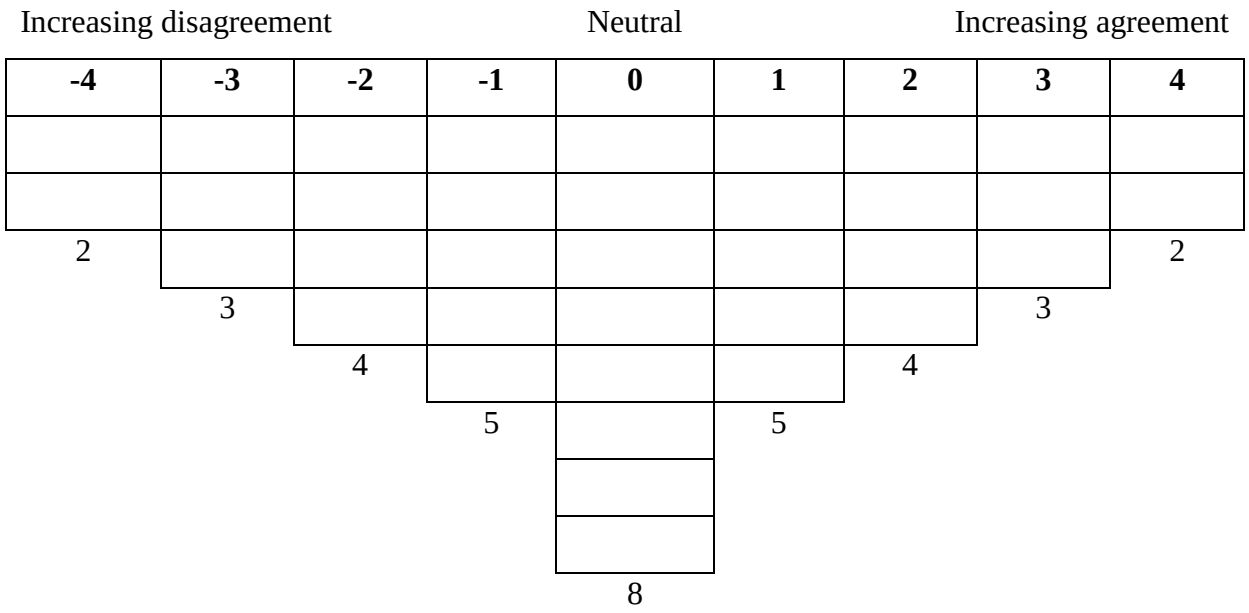


Figure 3. Grid employed for Q sorting the 36 statements by participants.

Note: the number above the grid are the scale score, while the numbers below are the total number of statements.

3. Results

We identified five pathways that showed the diverse experiences and points of view of the participants about the incorporation of young people into livestock farms. These pathways accounted for 75% of the variance of the entire system and reflect the different motivations, paths and strategies followed by young people to incorporate themselves into the livestock sector. As shown in Table 2, 79% participant's Q sorts, load significantly in one pathway. The pathways identified according to the scores of each statement on them (Table 3) were: (i) the Traditional pathway; (ii) the Neo-rural pathway; (iii) the Business pathway; (iv) the Industrial pathway; and (v) the Agroecological pathway.

Table 2. Profiles of the participants and their loadings on each pathway

Participants	Pathways

	Traditional	Neo-rural	Business	Industrial	Agroecological
Agriculture expert (territory and peasantry)	-0.1854	**0.6267**	0.2549	0.1579	**0.4725**
Agriculture expert (agroecological and peri-urban)	0.0139	**0.9277***	0.1429	-0.0717	-0.178
Agriculture expert (agrarian dynamization)	0.1262	**0.9486***	0.0585	-0.0465	0.0475
Agriculture expert (agriculture and livestock)	0.3297	**0.4803**	-0.0536	0.1432	0.2496
Researcher (sociology)	-0.1267	0.1328	0.2830	-0.0421	0.1046
Researcher (agrarian economy)	-0.1637	-0.1837	0.1487	**0.7271***	0.0230
Researcher (rural development policies)	0.3604	0.0648	-0.1243	**0.6822***	-0.0940
Agriculture teacher (ecological production)	0.3493	0.2267	0.0273	-0.0007	-0.1095
Agriculture teacher (livestock production)	**0.7694***	0.0578	0.1691	0.0021	-0.0298
Agriculture teacher (livestock production)	0.2970	0.2648	0.1049	-0.1552	0.0005
Agriculture teacher (crop production)	-0.1051	-0.0034	0.3539	-0.1330	0.3429
Agriculture teacher (crop production)	**0.7815***	0.0411	0.1230	0.1074	-0.0731
Agriculture teacher (livestock production)	**0.8423***	0.0746	-0.0964	-0.1219	0.2033
Agriculture teacher (livestock production)	**0.8717***	-0.0228	-0.0520	-0.1309	0.2756
Government official (support for the incorporation of young people)	0.1222	0.0671	**0.9485***	0.0638	-0.1117
Government official (support for young people in the rural sector)	0.1985	0.0329	**0.9360***	0.0133	-0.0803
Producer (extensive livestock farming)	-0.2098	0.4108	0.2592	0.0272	0.2151
Producer in partnership (dairy sheep and cheese)	0.3398	0.0911	-0.1079	0.0234	**0.8729***
Producer (sheep shepherd, second generation)	0.3117	-0.0000	-0.1332	-0.0173	**0.8799***
Producer (agroecological tourism)	0.0663	**0.9403***	-0.1689	-0.0510	-0.0523
Representative of farmers association (young producers)	**0.5734**	0.1205	0.1077	0.3560	0.3175
Representative of farmers association (sheep and goats)	**0.4653**	0.1381	0.0004	**0.4509**	0.2458
Young livestock farmer in training (incorporation process)	**0.8317***	0.0059	0.1941	0.1311	0.1315
Young livestock farmer in training (incorporation process)	**0.8171***	0.0308	0.1503	0.1425	0.1361
Percentage of explained variance	**23**	**15**	**10**	**6**	**10**

* indicate the defining Q sorts, which are those carrying significant weight in each pathway. The Q sorts that load significantly ($p < 0.01$) but are not defining ones are in bold. The text in parentheses describes the work profile or productive orientation of the participants.

Table 3. Statement scores for each pathway.

	Statements	Pathways				
		Traditional	**Neo-rural**	**Business**	**Industrial**	**Agroecological**
1	Young people who join the agrarian sector through natural generational replacement tend to innovate less.	0	-1	-1	-1	0
2	The reluctance of parents and grandparents to accept the changes proposed by their offspring affect generational replacement.	2	0	-1	-1	-1
3	Economic crisis and unemployment encourage people to return to farm work.	1	2	1	-2	0
4	Family tradition plays a more important role in the generational replacement that takes place in the livestock sector than in other agricultural activities.	**3**	**3**	-2	1	-1
5	By cultivating the land and offering healthy food to the population, I can be an agent of social change.	0	**3**	-2	**-3**	0
6	Being a farmer is a very healthy of contributing to the improvement of the planet.	-1	-1	**-4***	-2	0
7	Young people not associated with rural areas see in the agricultural sector an opportunity for changing their lives.	**-3**	**3***	0	1	-4
8	Family tradition plays a crucial role in the process of incorporation into the agrarian sector.	**3**	**-3**	-2	**4**	**1***
9	It is essential to create policies that facilitate access to land.	2	**4**	2	**3**	**3**
10	Having an initial capital when incorporating into the agrarian sector is the main factor of success.	0	**-4**	1	**3**	**-3**
11	Agricultural producers work to pay their debts, not to make a living out of it.	-2	-2	**-3**	**-4**	0
12	Commercialization is a determining factor for newly-incorporated young people.	1	0	2	**-3**	0
13	Technological advances in the agrarian sector have reduced the need for labor effort, which encourages incorporation.	0	**-4**	-2	**4***	0

14	The active integration of women into agrarian activities favors innovation in the sector.	1	-2	2	0	**3**
15	Associating with other young people to start an agrarian enterprise is a factor of success.	3	1	-1	-2	2
16	The participation of women in the activities and decisions of agrarian enterprises is a factor of success.	-1	-3	2	0	**3***
17	Training young people is an essential tool for ensuring their successful incorporation into the agrarian sector.	**4**	1	**3**	2	1
18	Joining an economically profitable enterprise is a factor of success.	-2	1	**4***	2	-1
19	Establishing communication networks with other producers in the region contributes to the process of incorporation and is a factor of success.	0	0	1	0	2
20	CAP aid causes agrarian enterprises to appear to be misleadingly profitable.	-2	0	1	0	-1
21	The greater the availability of services (health, communications...) in rural areas, the greater the incentives for young people to return to the agrarian sector.	-1	2	**4**	**3**	-2
22	It is necessary to implement policies that support agroecological production and marketing.	1	2	-1	1	2
23	The existence of policies that provide accompaniment to young people when they join the agrarian sector is a crucial factor.	0	2	**3**	0	-1
24	The sacrifices required by agrarian work cause young people to distance themselves from it and to look for other labor alternatives.	**-3**	-2	**-3**	1	-2
25	The concept of agrarian family business is disappearing.	**-3**	1	0	**-3**	**-4**
26	Working in the agrarian sector reduces income expectations.	**-4**	-2	0	1	**-3**
27	Bureaucracy complicates aid application processes.	2	-2	0	0	2
28	Integrated production systems are well regarded by young people.	**-4**	**-4**	0	0	**-3**
29	CAP aid encourages the incorporation of young people into the agrarian sector.	2	-1	1	-2	-2

30	Agrarian extension services (providing advice to farmers) should be given more importance within the department of agriculture.	1	1	0	2	0
31	Training in business management, not in dependent labor, is essential for a successful incorporation into the agrarian sector.	**4**	0	**3**	-2	1
32	Innovation must be aimed at transforming what is produced and how it is marketed.	0	0	-1	0	1
33	Innovation must focus on the diversification of activities such as rural tourism and agritourism.	0	-1	**-4**	-1	**4***
34	Short marketing channels are a low-cost and profitable innovation for agrarian enterprises.	-1	0	0	**-4**	-2
35	Projects linked to agroecological production and short marketing channels attract more young people.	-2	**4**	**-3***	2	**4**
36	Agrarian activity is attractive to and increasingly recognized by certain sectors of society, which encourages the incorporation of young people into the agrarian sector.	-1	0	0	-1	1

* indicates distinctive statements, with a level of significance of $p < 0.01$. These are statements that show significant differences between one discourse and the rest. 'Consensus statements' are shaded; these are statements that do not allow to distinguish between two different drivers. In bold, statements in each discourse about which there is or less or more agreement (-3, -4 and +3, +4, respectively).

3.1. The Traditional Pathway

The profiles that are associated with this pathway are mainly teachers and tutors of agricultural training schools and young people in training. This pathway accounts for 23% of the variance; 33% of the participants adhered to it significantly. Its main idea is that family agricultural businesses transfer their ownership to a trained successor with high social capital, who gives a new identity to the family business.

In this pathway, family tradition plays a key role in the process of incorporating young people into livestock work (statements 4 and 8 with a rating of +3). Livestock farms are places where family businesses incubate and grow, something that is associated with the fact that work and home are together in the same place. This pathway suggests these dynamics and makes it clear that agrarian enterprises and family bonds are still strongly linked (statement 25 with a rating of

-3). *"The desire to work in a farm is the main inheritance of my parents"* (young livestock farming in training); this is an idea repeated by the proponents of this pathway.

This pathway considers that one of the measures that can be implemented in an agrarian family business is to improve the expertise of the successor on operational matters linked to the efficient management of production systems (such as feeding and reproduction of livestock), business management issues, including the diversification of income sources to make the business more profitable (distinctive statement 17 with a rate of +4), and changes related to the management and administration of the family business (distinctive statement 31 with a rate of +4). *"Parents who own agricultural businesses encourage their offspring to study and then return to the family business; they do not want them to work for others"* (Agriculture teacher).

Family tradition and training would not be sufficient incentives for young people if they did not have the support of the farm owner, which in most cases is their father. The predecessor's support involves a process of socialization of the successor and assignment of roles within the farm. Knowledge, skills, contacts and even marketing methods are transmitted through this process. However, the Traditional Pathway shows that reluctance to change by the predecessor can affect the process of succession and probably the associated family ties (statement 2 with a rate of +2). Seen from the point of view of family succession, this is a natural attitude and, to some extent, necessary, since it is not only a matter of transferring knowledge but also the family patrimony.

This pathway identifies a certain rejection of change and the adoption of vertically integrated production systems (distinctive statement 28 with a rate of -4), which is very common in Catalonia in the pork and poultry industries (see Industrial Pathway below). These production schemes have certain operational advantages, such as selling by agreement or the availability of continuous technical assistance, but the advocates of the Traditional Pathway see in these schemes a loss of autonomy and a brake with the family business tradition. This idea is shared with other pathways (Table 3).

This pathway is associated with production systems that allow to create synergistic links with other young people, either by developing a joint project, or by sharing benefits between different agrarian enterprises (distinctive statement 15 with a rate of +3). This teamwork perspective does not exclude the possibility of working with young people who do not have a family agrarian tradition (distinctive statement 7 with a rate of -3), since they it identifies in them a productive desire, and not only the aim of "*changing their lifestyle*". This highlights a relevant characteristic

of the Traditional Pathway, namely the confidence that people have in the agrarian sector and its capacity to continue to be a source of income (distinctive statement 26 with a rate of -4).

3.2. The Neo-rural Pathway

The profiles associated with this discourse are that of agricultural consultant and technician, as well as producers linked to rural tourism. This pathway accounts for 15% of the total variance and is sustained by 21% of the participants. This pathway highlights the role of livestock activities as an opportunity for young people with no family tradition in the sector to work in rural areas and change their lifestyle, mainly in association with agroecological production projects. The need to develop policies that facilitate access to land is a fundamental idea for the supporters of this pathway.

The pathway has characteristics related to the phenomenon of neo-rurality, which was described in 1980s as the settlement in rural areas of a collective of mostly young people coming from urban areas. The term "neo-rural" refers to those people who leave the city to go to the countryside with the aim of adopting an alternative lifestyle (distinctive statement 7 with a rate of 3*). The current dynamism of this group in rural areas is attributed to, among other drivers, the recent economic crisis in Spain, which caused a high rate of unemployment in the cities, and led many people to consider rural areas as an alternative for working and living (statement 3 with a rate of +2).

The origin of this group of people, usually non-agricultural, and its lack of links with the countryside, suggests that the incorporation of young people into the livestock sector depends to a large extent on access to land. Hence the importance that this discourse gives to the need of implementing policies that address this problem (distinctive statement 9 with a rate of +4). "*Young people outside the agricultural world are free to plan agricultural projects, but they don't have land*" is the comment of an agriculture expert. These young people not only have to face limited access to land, but also limited economic resources and agricultural infrastructure. This discourse also evidences the importance of agroecological production, which requires low investments, both in infrastructure and machinery (statement 35 with a rate of +4), and the use of short marketing channels to reduce transport and storage costs. The participants who agreed with this discourse rejected vertically integrated production systems (distinctive statement 28 with a rate of -4), which are seen as limiting the autonomy of farmers and as working against the production of food in environmentally and socially responsible ways (distinctive statement 5 with a rate of +3).

The proponents of this pathway think family tradition plays an important role in the process of incorporating young people into the livestock sector (distinctive statement 4 with a rate of +3) but do not consider it a determinant element (statement 8 with a rate of -3). This pathway considers that providing technical assistance, on productive and commercial issues, facilitates the process of incorporating new people to the livestock sector (statement 22 with a rate of +2). "*The incorporation into the agrarian world by urban or peri-urban young people is complex, particularly when they carry with them large degree of ignorance and romanticizing of rural life"* is the comment of an agriculture expert who works on the development of agroecological projects in peri-urban areas.

3.3. The Business Pathway

The Business Pathway is mainly associated with profiles of participants linked to the public administration and the provision of support to young people joining the agrarian sector. This pathway accounts for 10% of the variance, and 8% of the participants adhere to it. According to this pathway, the most important drivers in the incorporation of young people into the livestock sector are the economic profitability of the livestock farming enterprise, the training in business management of the young people, and the availability of basic services in the farm and its surroundings. Although this pathway considers it essential that young people are well-trained, it also attaches great importance to the provision of technical assistance and accompaniment support during the process of incorporation.

This pathway does not consider family tradition as an essential element for the incorporation of young people into the livestock sector (statements 4 and 8 with a rating of -2), and so it considers feasible the incorporation of young people into the livestock sector from outside the agrarian sector or who, although having being raised in the countryside, were disassociated from it at some point. This disassociation may be related to a period of education and professional development spent outside the farm, with the support of the family (statement 17, valuation 3), with or without the intention of returning to work in the farm. In the period of disassociation from the rural environment, the young person loses skills developed at an early age related to the management of agrarian activities. This hinders the process of reincorporation, requiring a greater degree of technical assistance and accompaniment (statement 23 with a rate of +3). *"The young entrepreneur knows how to identify the problems of the sector, but not how to solve them",* is the comment of a government official.

The incorporation of young people into livestock farms is encouraged either by the unemployment caused by the economic crisis, or by the realization that the family farm is a profitable enterprise and a good professional alternative (statement 18 with a rate of +4*). *"In small agrarian enterprises with financial problems, it is not feasible to invest in making generational replacement attractive"*, is the comment of an agriculture teacher. Participants who adhere to this pathway tend to value very positively the availability of services either in the farm (such as internet, water and electricity, waste collection, etc.), or in its surroundings (such as health care or agricultural extension) (statement 21 with a rate of +4). These services are seen as essential because they assure young people a certain quality of life, and they facilitate the development of skills and knowledge acquired outside the farm, during the formative stage (statements 31 and 17 with a rate of +3).

According to the proponents of the Business Pathway, the projects of most of the people who wish to join the livestock sector aim to maintain proven production practices, either with the purpose of selling milk and calves or producing beef; they do not plan to adopt any type of innovation related to diversification processes, nor do they show interest in agroecological production or short marketing channels (distinctive statement 35 with a rate of -3*). Traditional production systems focus only on primary production, not on transformation processes; this is how they generate income and wealth. Therefore, this type of businesses cannot make a positive contribution to the environment (statement 6 with a rate of -4). *"The value of food is increasingly dependent on its origin and the way it is produced; this puts rural producers in the spotlight"*, is the comment of a government official.

3.4. The Industrial Pathway

The profiles associated with this discourse are mostly those of researchers and representatives of producer associations. This pathway accounts for 6% of the total variance. Thirteen percent of the participants adhere to it. The advocates of this pathway compare the work carried out in livestock farms to the work carried out in a factory or small business, promoting the use of technological advances that could facilitate the work of farmers and highlighting the changes that have taken place in rural areas and that allow people to have access to a great variety of services. Newly incorporated young people are described as belonging to families with agricultural tradition, who value the knowledge and the advantages generated by new production models, such

as vertically integrated systems (mainly for pork and beef production), which allow to families continue in the livestock business with less risks but also with less autonomy.

This pathway recognizes the importance of the family tradition in the process of incorporation of young livestock farmers into the sector (statements 8 and 4, with a rate of +4 and +1 respectively). It also identifies a process of growing disaffection with agrarian activities among the rural youth, which is largely attributed to the harsh conditions under which livestock activities are carried out on a day-to-day basis (statement 24 with a rate of +1). The advocates of this pathways emphasize that the technological advances that have improved working conditions in the agrarian sector (distinctive statement 13, with a rate of +4*) are the main factor in the incorporation of young people into the sector, more important than other drivers such as the economic crisis or unemployment (statement 3 with a rate of -2).

According to this pathway, a successful incorporation into the livestock sector requires the existence of an economic patrimony and a profitable exploitation at the moment of taking the reins of the business (statements 10 and 18 with a rating of +3 and +2). It does not consider the possibility that agrarian enterprises and producers might be burdened by excessive indebtedness (statement 11 with a rating of -4), which would increase the risk of a failed incorporation. The presence of policies that facilitate access to land is also considered essential (statement 9 with a rating of +3).

A way that allows young people to join the livestock sector with good chances of success, according to the advocates of the Industrial Pathway, is to associate the farm with other companies (statement 31 with a rating of -2), either through contractual livestock production or by joining a vertically integrated production (statement 28 with a rating of 0), which would reduce the costs and problems associated, for example, with marketing (statement 12 with a rating of -3). This pathway does not suggest a bucolic vision of working in the livestock sector nor does it consider farmers as agents of social change in rural areas, but rather as parts of an intensive production system (statement 5 with a rating of -3). *"Vertically integrated systems receive many people who join the livestock sector for the first time; it would be important to know if the young people who join those enterprises know that they are becoming part of a monotonous production system, with low profit margins and strict demands from the integrative company"*, is the comment of an representative of farmers association.

3.5. The Agroecological Pathway

The profiles associated with this discourse are mostly of agrarian consultants and livestock producers. This pathway accounts for 10% of the total variance, and 13% of the participants adhered to it. The central idea of this discourse is that adopting an agroecological production strategy, using short marketing channels, a diversified economic strategy and giving women a greater role, encourages young people to become interested in the livestock sector.

The advocates of this pathway recognize the importance of family tradition in the livestock sector. However, it is not seen as an essential factor for the successful incorporation of new people into the livestock sector (statements 8 and 4 with a rating of +1* and-1). In spite of this, this pathway vindicates the capacity of agrarian family enterprises to maintain their viability (statement 25 with a rating of -4). It is important to emphasize that the advocates of this pathway do not consider it essential for the success of a family livestock enterprise to have a tradition of livestock farming, but they consider it necessary to have previous link to the rural environment. *"Rurality and identification with the agrarian world are incentives for the incorporation of young people"*, is the comment of an agriculture expert in agricultural dynamization.

For the advocates of this pathway, having a considerable economic patrimony is not an essential requirement for the implementation of new livestock projects (statement 10 with a rating of -3). What is required is access to land (statement 9 with a rating of +3). These specific conditions are related to the particular development strategy proposed by the advocates of this pathway, which is nothing more than agroecological production, the use of productive techniques that respect the environment (statement 35 with a rating of +4), short marketing channels, combining agricultural activity with other activities such as rural tourism (distinctive statement 33 with a rating of +4*), and giving women a leading role in the promotion and administration of livestock projects (statement 14 with a rating of +3; distinctive statement 16 with a rating of +3*). These innovative development strategies are also seen by the advocates of the Agroecological Pathway as ways to encourage the incorporation of young people into the sector. *"There is a resurgence of the agrarian vocation, related to agroecology and diversification activities and with the participation of young people with and without agrarian experience"*, is the comment of an agriculture expert in territory and peasantry.

Young people who seek to join the livestock sector are not seen as people looking for a change of lifestyle with the hope of an idyllic future (statement 7 with a rating of -4), but rather as people looking for solid job opportunities (statement 26 with a rating of -3). This situation is thought of

as generated by the recent economic crisis and the high levels of unemployment in urban areas (statement 3 with a rating of 0).

4. Discussion

The five pathways characterized in the previous section describe the complexity of the process through which young people join the livestock sector in Catalonia. These five pathways point to the existence of multiple experiences regarding the process of incorporation of young livestock farmers into the livestock sector. The coexistence of different points of view, interests and possible adaptation strategies are part of the complex and multidimensional nature of this process, as has been reported by some authors (Mishra and El-osta, 2007; Borec et al., 2013; Banovic et al., 2015; Rovný, 2016). Each of these pathways show specific features but also share some features with the others. The following drivers have been identified as the main determinants of the type incorporation process followed by young livestock farmers: (i) the presence or absence of an agrarian family tradition; (ii) the capacity to access adequate land; (iii) the level of training of the young people; (iv) the degree of innovation in livestock activities; and the (v) the degree of autonomy in decision-making. In Figure 4 it is shown the influence of each of the five drivers on the five pathways identified.

Having an agrarian tradition has long been considered a determinant factor for the incorporation of young people into the livestock sector (Sharp and Smith, 2003; Mishra and El-osta, 2008; Lobley, 2010; Joosse and Grubbström, 2017). In the pathways identified, the position is diverse. In some pathways, the existence of an agrarian family tradition is seen as an influential factor in the process (Traditional and Industrial) through which young people join the livestock sector. This is based on the tangible assets that the family can give to a young farmer, (e.g., land, economic resources, housing, machinery, etc.), as well as the intangible resources (e.g., social networks, organizational structures, information and knowledge) that are essential for the viability of a livestock farm (Lobley, 2010; Grubbström and Sooväli-Sepping, 2012; Price, 2012). In the Neo-rural, Business and Agroecological Pathways the existence of family tradition does not play an important role; those pathways highlight instead the role of other drivers, such as the "sense of identity" (i.e., the need to belong to a place, territory and, in some cases, to a tradition or culture). The positive role played by the sense of belonging to a particular identity in the incorporation process of young people into the livestock sector has also been reported by other authors (González and Benito, 2001; McGuire et al., 2013; Stenholm and Hytti, 2014). Some studies

suggest that the perception that farmers have of themselves is still based on their traditional identity (Burton and Wilson, 2006) as described in the Traditional and Industrial Pathways. Others suggest that farmers identify themselves more and more as entrepreneurs or businessmen (Bryant 1999; González and Benito, 2001; Burton, 2004; Vesala and Vesala, 2010) as described by the Neo-rural, Agroecological and Business Pathways. This disagreement can be explained by the fact that farmers are simultaneously building multiple overlapping identities (Niska et al., 2012), as indicated by the coexistence of the five pathways identified in the present study.

The contribution of new ideas, skills and experiences represented by the incorporation of young people into a given region has also been highlighted by some authors (Lobley and Potter, 2004; Lobley, 2010), as in the Business, Agroecological and Neo-rural Pathways, which do not consider the existence of a family tradition as an essential factor for the successful incorporation of young people. However, it must be borne in mind that the main way for accessing the agrarian sector continues to be intergenerational transfer within the family (Lobley, 2010).

The five pathways coincide in identifying the difficulty of accessing adequate land and the lack policies that address this issue as two of the main obstacles for the incorporation of young people into the livestock sector (Table 3, statement 9). Grubbström and Sooväli-Sepping (2012) point out that having access to sufficient and adequate land is essential for the viability of livestock enterprises managed by new farmers. More importance to these barriers are given by those pathways that do not consider family tradition as an essential element for starting a livestock project: the Neo-rural and Agroecological Pathways. These preferably focus on livestock production models in which land is the main factor. Similarly, Industrial Pathway focuses on the intensive production of meat, but which nevertheless highlights the importance of land for the production of food of animal origin and crops as an additional source of income. These barriers, which, to a greater or lesser extent, are highlighted by all pathways, increase in importance when one considers the livestock sector has to compete for land with other economic activities. In fact, access to sufficient and adequate land is very likely the main threat facing livestock production worldwide, especially in the case of extensive livestock farming (López-i-Gelats et al., 2016). Some authors (Paniagua, 2001) also point out the detrimental role of some subsidies, mainly those that depend on the amount of land, since they promote that owners cling to their lands or rent them at high prices, reducing the probability that new farmers have access to adequate land.

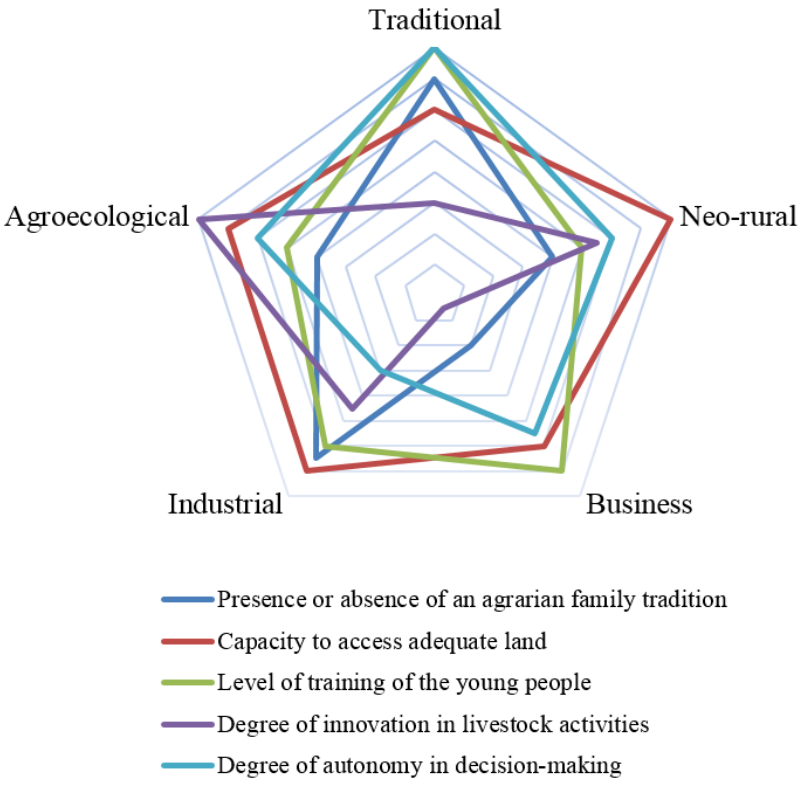


Figure 4. The main drivers and their influence on the understanding of the five pathways identified of incorporation of young livestock farmers into the livestock sector.

Note: The weight of each driver on the different pathways was calculated based on the scores of different statements characterizing the drivers (see Table 3). In particular: (i) the presence or absence of an agrarian family tradition (statements 4 and 8); (ii) the capacity to access adequate land (statement 9); (iii) the level of training of the young people (statement 17); (iv) the degree of innovation in livestock activities (statements 33 and 35); and (v) the degree of autonomy in decision-making (statements 28 and 31).

Training and personal capacity are key elements in the ability of farmers to adapt to changing socio-economic circumstances and to benefit from them (Kontogeorgos et al., 2014). The level of training of producers is closely related to their ability to take advantage of existing agrarian extension systems (Stefanakis et al., 2007), and to implement adaptation strategies in their livestock farms. In fact, higher levels of education in livestock farmers are correlated with an increase availability of useful agricultural land (Corbelle and Crecente, 2014). All the pathways identified in the present study agree in the importance of training and the positive impact it has on the implementation of business projects (Table 3, statement 17). According to data from

ECORYS (2015), the generation of farmers that is currently incorporating into the livestock sector has a higher level of education and training than its predecessors. In the case of Spain, 33.1% of all young farmers have a high level of professional training, even though this percentage is lower than the percentage of highly-trained young in the EU-28 (43.9%) and in the EU-15 (44.8%). Although all pathways agree in the importance of training, not all of them agree in the type of training that farmers, especially new farmers, should have. The Traditional and Business Pathways indicate that young new farmers should be trained in agrarian business management. In contrast, the Agroecological and Neo-rural Pathways suggest that new young farmers need training in agroecological production and marketing. This was also proposed by the European Commission (EC) in the report "Young farmers' needs", which indicated that Spanish farmers needed training in business, natural resources, and environmental management (ECORYS, 2015).

Regarding the importance of innovation, there are differences between the pathways. The importance of innovations focused on transforming the products of livestock farms with the aim of creating new markets is uncertain, according to most pathways. This may be due to the complexity of combining production and transformation tasks, which depend on drivers such as the availability of economic resources, marketing strategies, training and specific knowledge of the processes involved. This type of innovation is too complex for most agrarian households; it requires a synergistic interaction between local and expert knowledge, the capacity to build networks and extract value from these networks, personal motivation and the will to persist until reaching the objectives of the innovative method or strategy (Mc Fadden and Gorman, 2016). The Traditional and Industrial Pathways emphasize the importance of family tradition in the process of generational but disagree on the need to implement agroecological production projects, the use of short marketing channels, and the diversification of agrarian activities into rural tourism and agritourism. This coincides with the findings of Mc Fadden and Gorman (2016), who indicate that producers with agrarian family ties have a responsibility to "preserve" a heritage or a traditional way of life, which makes it difficult to make drastic changes. In contrast, the pathways that do not give importance to family tradition are prone to propose productive alternatives linked to agroecological production and short marketing channels (Neo-rural and Agroecological). These pathways emphasize that these productive strategies are associated with innovation and higher levels of agriculture entrepreneurship, and can encourage existing farmers to adopt similar strategies (EIP-AGRI, 2016).

The technological advances that have reduced the need for labor effort in the livestock farms (Table 3, statement 13) is another key aspect that affects the quality of life and well-being of young farmers and generates controversy in the different pathways identified. This aspect is only of great importance in the Industrial Pathway, agreeing with what was reported by Kontogeorgos (2014), who mentions that adoption of new technologies in the exploitation drive the young person to incorporate. However, in the Traditional, Neo-rural, Business and Agroecological Pathways this assumption does not generate importance in the incorporation process, this may be due to the fact that the existence of technology installed in the exploitation does not impose on the young farmers the production system to which they want to incorporate reducing their autonomy (Dreby et al., 2017).

Another aspect on which the pathways disagree is the degree of autonomy in decision making that is considered most appropriate. While some the Traditional, Neo-rural, Business and Agroecological Pathways consider that young people joining the livestock sector should become their own bosses and, therefore, enjoy a high degree of autonomy, other discourses consider it much more convenient to delegate a significant number of decisions to other companies, as is the case in vertically integrated systems, which are promoted by the Industrial Pathway. Delegating decisions to another company through vertical integration allows farmers to have lower commercialization risks (statement 12). It also allows to assume a greater role in the management of activities that generate greater added value (Rodríguez et al., 2014), and generates concrete benefits, such as a reduction in transaction costs, greater uniformity of the products and greater economic efficiency. However, vertical integration tends to concentrate the production of goods in a few hands, either through private companies or cooperatives (Rodríguez et al., 2014). This has disadvantages for integrated livestock farmers, such as conditioning incentives to compliance with performance objectives, decreased flexibility due to the presence of production barriers, dissociation between suppliers and consumers, a lack of external opportunities and reduced capacity for negotiating a change of integrator company (Den Ouden et al., 1996).

Having a high degree of autonomy in decision-making allows young people in the process of incorporation to the livestock sector to adapt more easily to the new work, to enjoy a feeling of freedom and independence, and to strengthen family traditions (Lasley, 2005). The Traditional, Neo-rural, Business and Agroecological Pathways highlight this need for autonomy, which in practice takes many forms, including resistance to market pressures, the implementation of agri-environmental schemes, the formation of cooperatives or the prioritization of non-economic

objectives. Moreover, autonomy is related to authenticity and is a key element in the willingness of farmers to take new ways and to implement innovative practices (Stock and Forney, 2014).

5. Conclusions

The incorporation of young livestock farmers into the livestock sector is one of the main challenges that the European livestock sector is facing. We need a dynamic, flexible and adaptable livestock sector that can face current and future challenges. One of the most obvious reasons for the existence of this bottleneck in the livestock sector is the complex nature of the process of incorporating young people into it.

The present work identified a diversity of existing experiences about the process of incorporation of young people into the livestock sector. By using the Q methodology five different pathways were identified, corresponding to the Traditional Pathway, the Neo-rural Pathway, the Business Pathway, the Industrial Pathway, and the Agroecological Pathway, comprising five different ways of experiencing the process.

The coexistence of different points of view and experiences indicates the complex and multidimensional nature of the process of incorporating young farmers into the livestock sector. The five pathways identified are determined by the differential influence on them of five key drivers: (i) the existence or not of an agrarian family tradition; (ii) the possibility of having access to land; (iii) the level of training of young farmers; (iv) the degree of innovation implemented in the farm; (v) the degree of autonomy in decision-making of young farmers.

Finally, two fundamental challenges for policy makers were identified: (i) facilitating land access, and (ii) developing training services adequate for the dissimilar needs of young livestock farmers following different pathways of incorporation. The five pathways agree on the importance of having access to land, on the need for policies aimed at increasing the availability of land, however this aspect has not been addressed by most administrations whose interventions tend to focus on facilitating the incorporation of young people into the livestock sector mainly by providing subsidies or training. The importance of facilitating training adequate for young livestock farmers also generates consensus. It also comprises a relevant void to be addressed in order to make the incorporation of young livestock farmers into the sector easier. however, it should be stressed the large differences existing in terms of training required depending on the pathway of incorporation followed (e.g. the Agroecological Pathways versus the Business

Corbelle, E., Crecente, R. 2014. Evaluating IRENA indicator “Risk of Farmland Abandonment” on a low spatial scale level: The case of Galicia (Spain). Land Use Pol. 38, 9–15.

DARPA, 2015. Rural Development Programme (Regional) Cataluña, Spain. Departament d’Agricultura Ramaderia, Pesca i Alimentació. 893 pp. (Accesed 8 November 2018) http://agricultura.gencat.cat/web/.content/09-desenvolupament-rural/programa-desenvolupament-rural/periode-2014-2020/enllacos-documents/fitxers-binaris/170831_programa_desarrollo_rural_catalunya_2014_2020_versio_5_1.pdf

Darnhofer, I. Lamine, C., Strauss, A., Navarrete, M. 2016. The resilience of family farms: Towards a relational approach. J. Rural Stud. 44, 111–122.

Delgado, C., Rosegrant, M., Steinfeld, H., Ehui, S., Courbois, C. 2001. Livestock to 2020: The Next Food Revolution. Outlook Agric. 30(1), 27–29.

Den Ouden, M., Dijkhuizen, A.A., Huirne, R.B.M., Zuurbier P.J.P. 1996. Vertical Cooperation in Agricultural Production--Marketing Chains, with Special Reference to Product Differentiation in Pork. Agribusiness 12(3), 277–290.

Dreby, J., Jung, G., Sullivan, R. 2017. At the nexus of work and family: Family farms in upstate New York. J. Rural Stud. 49, 151–161.

EC/COM, 2011. The CAP Towards 2020: Meeting the Food, Natural Resources and Territorial Challenges of the Future. (Accesed 8 November 2018) http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A7-2011-0202+0+DOC+XML+V0//EN.

EC, 2013. Rural development in the EU - Statistical and Economic Information - Report 2013. Brussels, 390 pp. (Accesed 8 November 2018) https://ec.europa.eu/agriculture/sites/agriculture/files/statistics/rural-development/2013/full-text_en.pdf

EC, 2017a. Modernising and simplifying the CAP: Economic challenges facing EU agricultura. European Commission, Brussels, 42 pp. (Accesed 8 November 2018) https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/eco_background_final_en.pdf

EC, 2017b. Modernising and simplifying the CAP: Climate and Environmental challenges facing EU agriculture and rural areas. European Commission, Brussels, 34 pp. (Accesed 8 November 2018) https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/env_background_final_en.pdf

EC,2017c. Modernising and simplifying the CAP: Socio-Economic challenges facing EU agriculture and rural areas. European Commission, Brussels, 37 pp. (Accesed 8 November 2018) https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/soc_background_final_en.pdf

EU SCAR, 2013. Agricultural knowledge and innovation systems towards 2020 - an orientation paper on linking innovation and research, European Commission. Brussels, 167 pp. (Accesed 6 November 2018) http://www.acta.asso.fr/fileadmin/ressources/Europe/Autres_documents_et_presentations/End_report_CWG_AKIS_Final_version__for_EU_printer.pdf

ECORYS, 2015. Young farmers' needs in Spain Annex I . 26 to the Pilot project : Exchange programmes for young farmers. Rotterdam, 24 pp. (Accesed 6 November 2018) https://ec.europa.eu/agriculture/sites/agriculture/files/external-studies/2015/young-farmers/country-reports/annex-i.26-spain.pdf

EIP-AGRI, 2016. New entrants into farming: lessons to foster innovation and entrepreneurship. European Commission. Brussels, 40 pp. (Accesed 6 November 2018) https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/eip-agri_fg_new_entrants_final_report_2016_en.pdf

Esparcia, J. 2014. Innovation and networks in rural areas. An analysis from European innovative projects. J. Rural Stud. 34, 1–14.

Eurobarometer, 2010. Europeans, Agriculture and the Common Agricultural Policy. Special Eurobarometer 336. Brussels, 166 pp. (Accesed 6 November 2018) http://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_336_en.pdf.

Eurostat, 2014. Agriculture, forestry and fishery statistics. Luxembourg, 204 pp. (Accesed 6 November 2018) https://ec.europa.eu/eurostat/documents/3217494/6639628/KS-FK-14-001-EN-N.pdf/8d6e9dbe-de89-49f5-8182-f340a320c4bd

Eurostat, 2016. Small and large farms in the EU - statistics from the farm structure survey. (Accesed 6 November 2018) http://ec.europa.eu/eurostat/statistics-explained/index.php/Small_and_large_farms_in_the_EU_-_statistics_from_the_farm_structure_survey

González, J.J., Benito, C.G. 2001. Profession and Identity. The Case of Family Farming in Spain. Sociol. Rural. 41(3), 343–357.

Grubbström, A., Sooväli-Sepping, H. 2012. Estonian family farms in transition: A study of

intangible assets and gender issues in generational succession. J. Hist. Geogr. 38 (3), 329–339.

Grubbström, A., Stenbacka, S., Joosse, S. 2014. Balancing family traditions and business: Gendered strategies for achieving future resilience among agricultural students. J. Rural Stud. 35, 152–161.

Guillaume, R., Doloreux, D. 2011. Production Systems and Innovation in "Satellite" Regions: Lessons from a Comparison between Mechanic Valley (France) and Beauce (Québec). Int. J. Urban Reg. Res. 35(6), 1133–1153.

INE, 2017. Instituto Nacional de Estadística, Encuesta sobre la Estructura de las explotaciones agrícolas 2016, Spain. (Accesed 6 November 2018) https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176854&menu=resultados&idp=1254735727106

Jacques, S., 2014. Science and animal welfare in France and European Union: Rules, constraints, achievements. Meat Sci. 98(3), 484–489.

Joosse, S., Grubbström, A. 2017. Continuity in farming - Not just family business. J. Rural Stud. 50, 198–208.

Kontogeorgos, A., Michailidis, A., Chatzitheodoridis, F., Loizou, E. 2014. "New Farmers" a Crucial Parameter for the Greek Primary Sector: Assessments and Perceptions. Procedia Econ. Financ. 14(14), 333–341.

Koutsou, S., Partalidou, M. & Ragkos, A., 2014. Young farmers' social capital in Greece: Trust levels and collective actions. J. Rural Stud. 34, pp.204–211.

Kvakkestad, V., Rørstad, P.K. & Vatn, A., 2015. Norwegian farmers' perspectives on agriculture and agricultural payments: Between productivism and cultural landscapes. Land Use Pol. 42, 83–92.

Lasley, P., 2005. All in the family: The decision to take up farming. Agricultural Outlook Forum 2005. 10 pp. (Accesed 5 November 2018) http://ageconsearch.umn.edu/record/32820/files/fo05la01.pdf

Lobley, M. 2010. Succession in the family farm business. J. of Farm Manage. 13, 839–851.

Lobley, M. & Potter, C. 2004. Agricultural change and restructuring: Recent evidence from a survey of agricultural households in England. J. Rural Stud. 20(4), 499–510.

López-i-Gelats, F., Tàbara, J.D., Bartolomé, J. 2009. The rural in dispute: Discourses of rurality in the Pyrenees. Geoforum, 40(4), 602–612.

López-i-Gelats, F., Tàbara, J.D., 2010. A cultural journey to the agro-food crisis: policy discourses

in the EU. J. Agric. Environ. Ethics 23(4), 331–344.

López-i-Gelats, F., Milán, M.J., Bartolomé, J. 2011. Is farming enough in mountain areas? Farm diversification in the Pyrenees. Land Use Pol. 28(4), 783–791.

López-i-Gelats, F. Rivera-Ferre, M.G., Madruga, C., Bartolomé, J. 2015. Is multifunctionality the future of mountain pastoralism? Lessons from the management of semi-natural grasslands in the Pyrenees. Span. J. Agric. Res. 13(4), 1–14.

López-i-Gelats, F. Fraser, E.D.G., Morton, J.F., Rivera-Ferre, M.G. 2016. What drives the vulnerability of pastoralists to global environmental change? A qualitative meta-analysis. Glob. Environ. Chang. 39, 258–274.

Mandolesi, S. Nicholas, Ph., Naspetti, S., Zanoli, R. 2015. Identifying viewpoints on innovation in low-input and organic dairy supply chains: A Q-methodological study. Food Policy, 54, 25–34.

MAPAMA, 2016. Datos básicos de la agroalimentación en Cataluña 2016, 2 pp. (Accesed 6 November 2018) http://agricultura.gencat.cat/web/.content/de_departament/de02_estadistiques_observatoris/13_publicacions_estadistica_del_dar/04_dades_basiques_arp/quadriptic_anual_de_dades_basiques/arxius_estatics/dadesagroalim2016es.pdf.

Mc Fadden, T., Gorman, M. 2016. Exploring the concept of farm household innovation capacity in relation to farm diversification in policy context. J. Rural Stud. 46, 60–70.

Mc Guire, J., Morton, L.W., Cast, A.D. 2013. Reconstructing the good farmer identity: Shifts in farmer identities and farm management practices to improve water quality. Agric. Human Values, 30(1), 57–69.

Milne, J.A. 2005. Societal expectations of livestock farming in relation to environmental effects in Europe. Livest. Prod. Sci. 96, 3–9.

Mishra, A.K., El-osta, H.S. 2007. Factors Affecting Succession Decisions in Family Farm Businesses: Evidence from a National Survey. J. of the American Society of Farm Managers and Rural Appraisers 2007, 1–10.

Mishra, A.K., El-osta, H.S. 2008. Effect of agricultural policy on succession decisions of farm households. Rev. Econ. Househ. 6(3), 285–307.

Mishra, A.K., El-osta, H.S., Shaik, S. 2010. Succession Decisions in US Family Farm Businesses. J. Agric. Resour. Econ. 35, 133–152.

Monllor, N., 2013. La Nova Pagegia: Vers un Nou Model Agrosocial. Quaderns Agraris, 35, 7–

24. (Accesed 8 November 2018) http://130.206.88.107/revistes224/index.php/QA/article/viewArticle/73773.

Moragues-Faus, A. 2014. How is agriculture reproduced? Unfolding farmers' interdependencies in small-scale Mediterranean olive oil production. J. Rural Stud. 34, 139–151.

Murdoch, J. 2000. Networks - A new paradigm of rural development?. J. Rural Stud. 16, 407–419.

Niska, M., Vesala, H.T., Vesala, K.M. 2012. Peasantry and Entrepreneurship As Frames for Farming: Reflections on Farmers' Values and Agricultural Policy Discourses. Sociol. Rural. 52(4), 453–469.

Paniagua, A., 2000. Analysis of the evolution of farmers' early retirement policy in Spain. The case of Castille and Leon. Land Use Pol. 17(2), 113–120.

Paniagua, A. 2001. Agri-environmental policy in Spain. The agenda of socio-political developments at the national, regional and local levels. J. Rural Stud. 17(1), 81–97.

Pereira, M.A., Fairweather, J.R., Woodford, K.B., Nuthall P.L. 2016. Assessing the diversity of values and goals amongst Brazilian commercial-scale progressive beef farmers using Q-methodology. Agric. Syst. 144, 1–8.

Phillips, M. 2005. Differential productions of rural gentrification: Illustrations from North and South Norfolk. Geoforum, 36(4), 477–494.

Price, L. 2012. The Emergence of Rural Support Organisations in the UK and Canada: Providing Support for Patrilineal Family Farming. Sociol. Ruralis 52 (3), 353–376.

R Core Team, 2016. R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, version 3, p.3503. (Accesed 6 November 2018) https://www.r-project.org/

Robbins, P., Krueger, R. 2000. Beyond Bias? The Promise and Limits of Q Method in Human Geography. Prof. Geogr. 52(4), 636–648.

Rodríguez, S.V., Plà, L.M., Faulin, J. 2014. New opportunities in operations research to improve pork supply chain efficiency. Ann. Oper. Res. 219(1), 5–23.

Rovný, P. 2016. The Analysis of Farm Population with Respect to Young Farmers in the European Union. Procedia - Social and Behavioral Sciences, 220, 391–398.

Sánchez-Zamora, P., Gallardo-Cobos, R., Ceña-Delgado, F. 2014. Rural areas face the economic crisis: Analyzing the determinants of successful territorial dynamics. J. Rural Stud. 35, 11–25.

Schmolck, P. 2014. PQMethod Manual. (Accesed 6 November 2018)

http://schmolck.org/qmethod/pqmanual.htm

Sharp, J.S., Smith, M.B. 2003. Social capital and farming at the rural-urban interface: The importance of nonfarmer and farmer relations. Agric. Syst. 76(3), 913–927.

Stefanakis, A., Volanis, M., Zoiopoulos P., Hadjigeorgiou I. 2007. Assessing the potential benefits of technical intervention in evolving the semi-intensive dairy-sheep farms in Crete. Small Rumin. Res. 72(1), 66–72.

Stenholm, P., Hytti, U. 2014. In search of legitimacy under institutional pressures: A case study of producer and entrepreneur farmer identities. J. Rural Stud. 35, 133–142.

Stephenson, W. 1952. Some observations on Q technique. Psychol. Bull. 49(5), 483–498.

Stephenson, W. 1935. Technique of factor analysis. Nature, 136(3434), 297–297.

Stock, P. V. Forney, J. 2014. Farmer autonomy and the farming self. J. Rural Stud. 36, 160–171.

Sutherland, L.A. 2012. Return of the gentleman farmer?: Conceptualising gentrification in UK agriculture. J. Rural Stud. 28(4), 568–576.

TCE, 2017. El apoyo de la EU a los jóvenes agricultores debería estar mejor orientado a favorecer un relevo generacional eficaz. Informe Especial No.10. Tribunal de Cuentas Europeo, Luxembourg, 94 pp. (Accesed 6 November 2018) https://www.eca.europa.eu/Lists/ECADocuments/SR17_10/SR_YOUNG_FARMERS_ES.pdf

Thuiller, W., Vayreda, J., Pino, J., Sabaté, S., Lavorel, S., Gracia, C. 2003. Large-scale environmental correlates of forest tree distribution in Catalonia (NE Spain). Glob. Ecol. Biogeogr. 12, 313–325.

Tuyttens, F.A.M., Struelens, E., Van Gansbeke, S., Ampe, B. 2008. Factors influencing farmers' responses to welfare legislation: A case study of gestation sow housing in Flanders (Belgium). Livest. Sci. 116 (1–3), 289–299.

Van Exel, J., Van de Graaf, G. 2005. Q methodology : A sneak preview. 30 pp. (Accesed 8 November 2018) https://www.researchgate.net/profile/Gjalt_Graaf/publication/228574836_Q_Methodology_A_Sneak_Preview/links/02bfe50f946fc9978b000000.pdf

Vesala, H.T., Vesala, K.M. 2010. Entrepreneurs and producers: Identities of Finnish farmers in 2001 and 2006. J. Rural Stud. 26 (1), 21–30.

Williams, F., Farrington, J. 2006. Succession and the Future of Farming : Problem or Perception ?. The Rural Citizen: Governance, Culture and Wellbeing in The 21 Century, University of

Plymouth, UK, pp. 1–7. (Accesed 8 November 2018) https://www.researchgate.net/publication/240612384%0ASuccession.

Zabala, A. 2014. qmethod: A Package to Explore Human Perspectives Using Q Methodology. The R Journal, 6(2), 163–173.

Zabala, A., Pascual, U., García-Barrios, L. 2017. Payments for Pioneers ? Revisiting the Role of External Rewards for Sustainable Innovation under Heterogeneous Motivations. Ecol. Econ. 135, 234–245.

Zagata, L., Sutherland, L. 2015. Deconstructing the 'young farmer problem in Europe': Towards a research agenda. J. Rural Stud. 38, 39–51.

Zasada, I. 2011. Multifunctional peri-urban agriculture-A review of societal demands and the provision of goods and services by farming. Land Use Pol. 28(4), 639–648.