5. From dairy innovation to dairy specialization: disruption of cattle improvement and milk commercialization in Galicia (1900-1975)

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I. Introduction

Since the 1960s, intense dairy specialization has been occurring in Galicia and many other regions of the world. Climate conditions in this northwest region of Spain link it to other Atlantic agricultures, especially those of Bretagne and Ireland. During the 1960s, the Francoist authorities promoted the implantation of specialized cattle and technologies for obtaining milk in a productivist sense, following the logic of the Green Revolution.[106] Late specialization – compared to other European regions or even other northern regions of the Iberian Peninsula – has not hindered the consolidation of the dairy sector. It has shared all the successes of the most advanced agricultures in terms of technification, high-level production on farms and a dairy chain that connects it with industry and distribution, along with all the deficiencies related to hyper-intensification and its ecological footprint.

Before specialization entered the discussion, the production and sale of milk conformed to the multi-purpose logic of local cattle, as did calves destined for the meat market, which has been the focus of agrarian literature generally. In fact, the first studies on this issue came from economic history, which attempted to analyse early-twentieth-century agricultures based on elements that connected them to the rest of the system. Accordingly, it emphasized the existence of a market begun in the late nineteenth century for exporting calves by sea to England. With the crisis at the end of that century, the market was re-oriented towards supplying diverse nuclei on the peninsula by rail. This functioned until the Spanish Civil War (Villares,1982: 371-382; Carmona & De la Puente,1988: 184-198; Carmona, 2000: 315-339; Martínez, 1995: 143-207). The question of cattle improvement also emerged in the early twentieth century and ended up dividing technical experts and agronomists. An official line was established for improvement through crossbreeding with imported Simmental breed. These multi-purpose cattle, for milk, meat and traction were brought from Switzerland with the idea of increasing the weight of the descendants. This created conflict with other agricultural technical experts who defended time-honoured, farm-based 'pure selection' practices (Alenda, 1983: 367-370; Fernández,1992: 259-271; Conde Gómez, 2015: 77-92).

The scarce research on milk also comes from economic history but arrived at opposite conclusions to studies on meat. They attribute the general increase in Galician milk production during the first third of the twentieth century to the region's substantially higher number of milk cows, compared to others on the peninsula, rather than to their increased production. Milk was not yet economically relevant: cooperatives or processing industries had not managed to establish themselves, so there was nothing resembling a 'dairy sector' in today's sense of the word (Martínez, 1991: 33-39; 1995: 236-250). From an economic perspective, the search for qualitative, larger-scale improvement and commercialization of beef cattle generated the

[106] As understood in the agrarian literature: agriculture of purely capitalist logic, based on production in growth. Reproduction depends on achieving it in the most econonomically efficient way possible. See Picado (2011: 26-35); Moser & Varley (2013: 20-27).

understanding that meat should be the preponderant productive orientation. Thus, Galicia was assumed to be a place for meat specialization, to the detriment of any indication of dairy specialization. This notion is also very present in more general references to the region in Spanish agrarian literature (Calcedo, 1996: 233-235).

From our point of view, this interpretation needs revision for several reasons. The agrarian processes discussed here have been understood from positions more closely linked to orthodox economics. Accordingly, they centre on how agriculture relates to the rest of the economic system: in other words, its capacity to provide resources to the rest of the economy. This is measured with parameters such as efficiency, work productivity, production or commercialization. Parameter variability depends directly on how much technology has been incorporated into a given area of agriculture. In the nineteenth century a modernizing current began to spread in agriculture, but it was deeply rooted in the Enlightenment period (Fernández Prieto, Pan-Montojo and Cabo, 2014: 28-31). Its representatives – always from outside the peasantry – sought to make agriculture more productive by adopting technologies that brought it closer to emerging industrialization models. The challenge was initially assumed by a 'learned agriculture' that tried to translate new technologies from other regions to local spheres. Later, after competition from American production and the crisis at the end of the century, the states themselves became more aware of the need to develop regional agriculture for greater productivity. They took on the task of transmitting technologies by training new technical experts and creating a network of research centres for this purpose. So, we see how peasant agriculture has long been under this modernizing influence and how its representatives conditioned the peasantry towards transformation through the incorporation of technology. The type of actors involved – the state, technical experts, farmers – were key in this process, as they defined the results and their implications.

Thus, the conclusions derived from most of the research relevant to our case indicate very little improvement in agricultural output. This suggests that prior to the Green Revolution, farmers generally did not embrace technology for the productive improvement and commercialization of milk. This may have been slightly less the case for meat, which led to the understanding that Galicia was specializing in beef. However, some agricultural technologies were adopted in other regions, resulting in more relevant production and more visible advances. In the northern regions of Cantabria and Asturias, for example, Friesian cattle had been introduced in the nineteenth century and dairy processing industries were abundant (De la Puente, 1992: 151-195; Langreo, 1995: 52-104). Significant dairy specialization was also occurring in other regions of Europe, raising the question as to why it had not occurred in Galicia. The generally vague explanations habitually refer to scarce genetic selection, deficient cattle nutrition or the small size and poor innovation capacity of existing industries. This interpretation certainly fits with explanations of agricultural backwardness in Galicia, compared to other regions of the northern Iberian Peninsula or Europe. Seen through a teleological lens, the situation persisted until the 1960s, when the modernizing impulse of the state gave rise to new specialized dairy or beef operations that clearly improved the efficiency and production parameters of Galician agriculture.

Accordingly, the modernizing actions of the 1960s and all their consequences were inescapable as they largely involved perfecting the path to specialization and productive increase, to finally achieve what was understood as authentic agricultural progress. This vision managed to legitimize the Green Revolution by transmitting the idea of a single and inevitable path for agricultural development.

Studies criticizing this productivist agricultural model appeared very early on, pointing out its inherent environmental costs – pollution, fires, etc. – along with socioeconomic costs in the form of agricultural concentration and hyper-intensification or rural abandonment.[107] Other visions emerged to question whether the modernizing process need have progressed as it did or if the consequences were the necessary, inevitable and only way to improve agriculture. This also led to thinking about alternative development processes that were thwarted by the modernizing paradigm. Research focusing on these agricultures and their farmer-driven innovation capacity – before being abruptly modernized – has demonstrated that state-promoted Green Revolution modernization was not the only or necessary solution for achieving agricultural progress.[108]

In applying this premise to the Galician case (Fernández, 1992) discovered an innovation framework in the first third of the twentieth century by studying diverse spheres such as cattle, fertilizers, crops, and mechanization. It was emerging in similar societies across Europe from the imbrication of strong, organized farming with technical experts and state research organisms. Later, Conde (2015: 35-48) demonstrated how cattle improvement during that period and the configuration of the local breed in the following decades depended more on family-based selection of cattle with better qualities than on official improvement tactics.

Studying the dairy question should further our understanding along this line. On one end, state-driven modernization gave rise to sudden dairy specialization and an agro-industrial conglomerate, the strengths and weaknesses of which have been amply studied from the economic perspective. On the other, given the lack of research on what happened prior to that, we find room for new interpretations. Authors such as Conde (2015) are reaching beyond the perspective of final production data to focus on understanding the dynamics of change that emerged from the symbiosis between endogenous innovation and external technology, as observed from their corresponding historical dimension.

Exploring Galician milk issues offers a long-term perspective that reflects a line of work intended to demonstrate the existence of innovation processes that were crushed by the intense modernizing push, along with the consequences for agriculture and societies (Moser and Varley, 2013: 16-26; Fernández, Pan-Montojo and Lanero, 2017: 7-13; Fernández, Pan – Montojo and Lanero, 2018: 9-14). Fernández Prieto and Lanero Táboas (2020: 30-32) have also identified the need to further develop this perspective and pose new questions about Galician milk, as an opportunity to adjust the historical lens in relation to dairy progress. Our objective in this text is to continue developing the hypothesis that state modernization projects created a break with the innovation dynamic that was emerging in family-based agriculture. We will do so by studying cattle improvement in Galician dairy production and milk commercialization strategies, tracking state-driven and farmer-based approaches in two contiguous time periods that nonetheless had different logics and processes of change.

We have indications that milk-related cattle improvement and commercialization were happening prior to the Green Revolution, since at least the early twentieth century. The question for us is how to interpret these processes and gain insight concerning what we know happened in the 1960s. Peasant families were commercializing milk from the early twentieth century – and surely before – in a way coherent with their awareness of increasing demand. In this context, agricultural technical experts began to implement the first projects for improving milk production. In a state with scarce modernizing capacity, solutions arose that were more

[107] See Naredo J.M. (1974 [2004]: 215-259), González de Molina & Alier (2001: 7-31)
[108] Concerning this debate see also: Pujol et alii (2001: 97-108), Simpson (1997: 27-41)

aligned with the needs of rural families. They were interested in selling more milk because they perceived the demand, but they also needed to maintain other cattle aptitudes which were vital for the reproduction of the peasant family.

This connection catalysed an endogenous innovation process that fit the logic and needs of farming families. Our hypothesis is that this fledgling dynamic was disrupted by the Civil War and then crushed in the wake of state-driven modernization projects. This is why so little remains of what happened prior to state modernization and why our results might easily be overlooked. Our first objective is to trace this earlier dynamic and seek deeper knowledge of the innovative capacity of family-based agriculture, which was generally obstructed, leaving the state to promote innovation.

After the Spanish Civil War (1936-39), milk production in Galicia continued to be a relevant issue for the Francoist regime. Innovation in cattle improvement and milk commercialization would be mediated by two non-agricultural agents: the state and industry. Based on their productivity criteria, these actors defined the forms and pace at which smallholding agriculture would be transformed, then took the actions required to achieve it. The Francoist *New State* (Nuevo Estado), which prized centralization and authoritarianism, took charge of cattle improvement while newly created dairy processing industries monopolized commercialization. Unlike what had occurred before, the state acquired a strong modernizing will at this time and created new transmission pathways to accomplish it, such as the corporativist framework and the agricultural extension agencies. Industries also deployed their own formulas to this end and agrarian change took place under new conditions. From our point of view, this provoked a rupture with the prior dynamic that had new implications for the rural context.

Innovation derived from smallholding agriculture, which responded to family-based needs and logics, yielded to agricultural modernization promoted by the state and industry, to meet their needs.

Our second objective was to study the agricultural modernization measures promoted by the state and industry. However, all this took time in Galicia. Though the idea of dairy specialization appeared in technical literature in the 1940s, nothing of great transcendence materialized until the 1960s. At that time, the state and industry organized campaigns to import Friesian cows, expand pastures and increase fodder corn crops, silos and other technologies. The resulting model of intensive, specialized production facilities – for milk, along with meat, wine or potatoes in Galicia – altered family-based agriculture to fit state productive objectives.

We seek to overcome the interpretation of scarce dairy specialization based on economic end-production data, which identifies the early milk-related processes as antecedents to what occurred in the 1960s. In doing so, we want to better understand the tangible changes that occurred by looking at how state-implanted modernization destroyed earlier agricultural innovation capacity.

II. There was always milk in the house and it was never wasted: milk and innovation in Galician agriculture (1900-1936)

Milk is undoubtedly a key food, and one that best demonstrates nutritional change in Western societies during the twentieth century. Spain was no exception to the European dynamic of milk consumption (Nicolau, Pujol and Hernández, 2010: 148-151; Hernández, 2012: 222-229; Hernández and Pujol, 2016: 187 – 212); Hernández and Pujol, 2017: 65-68;

Hernández, Muñoz and Pujol, 2019: 28-36). As in most other European regions (Valenze, 2011: 260-267; Atkins, 2017: 37; Martiin, 2010: 213 - 222; Martiin, 2017: 23-29) perceptions about milk had been changing since the late nineteenth century and consumption was increasing at every level of society.

In Europe and in Spain, towns and cities led the process, because that was where scientific ideas arrived first and where more people heard about them (Hernández, Nicolau and Pujol, 2007: 304-309; Hernández, 2012: 229-260; Hernández and Pujol, 2017: 64-66). The best example of this was the need for local administrations to regulate and test the milk that came in. At this time, hygiene and public health was becoming a concern for municipal authorities, especially those with larger populations. It led to municipal initiatives to install laboratories (Sanz, 2014: 86-90; Lorda and Rúa, 2020: 38-47). Given that most of the products consumed in the cities were directly supplied by nearby rural areas, one of the main tasks of the laboratories was to analyse food before it reached the consumer. Milk was one they tried hardest to control because it was so easy to adulterate.[109] We see a constant effort at milk testing in Madrid and Barcelona during the first third of the century, but even more so from 1930 on (Hernández and Pujol, 2017: 69-73).

Similar processes were underway in Galicia. However, unlike other cities with predominately urban cattle or dairy facilities, here dairy women - called *leiteiras* - would bring milk in large jugs carried on burros or carts from the nearby rural areas into the urban centres. This task was primarily done by women. Habitually, one or two women in each parish would collect the milk from all the nearby families and sell it at a fixed location or deliver it directly to the homes of their clients. Later, as they had access to motorized vehicles, they expanded their radius of collection and the quantities they managed. In this way, they became established intermediaries in the milk business.

We can see the relevance of milk consumption in Galicia – and the northern provinces of the peninsula generally – in the statistics compiled in 1925 by the *Asociación Nacional de Ganaderos del Reino* (National Association of Cattle Farmers of the Kingdom), who were the first to address the question statewide. Until then, no private or public organism had considered the need to analyse the milk consumption of the population. The attempt to quantify it at that time is itself an indication of its increasing importance in general terms. The study of the presence of milk women allows us to better understand how milk was supplied for this increasing consumption and the dynamics it generated in the agricultural supply.

Table 5.1. Milk consumption in Galicia for the year 1925

Galician Provinces	Total milk production (litres)	Total milk consumption (litres)	% of milk consumed from total produced per year	Consumption per resident (l./year)
Coruña	43,576,557	31,993,199	73	73
Lugo	57,128,135	35,270,194	61	72
Ourense	24,599,196	21,406,964	87	51
Pontevedra	22,124,103	17,557,424	79	32

Source: *Leche, queso y manteca: Estadística de la producción en España*. Asociación General de Ganaderos del Reino, 1925

[109] The archive material shows a larger quantity of milk testing than another kind of food.

Milkwomen increased in number from 1910 on, as did concern for public health. The municipalities found it necessary to test this product as urban consumption grew. We do not know when milkwomen began to supply the demand for milk in urban populations; but milk analyses by laboratories provide the first indications of their presence. This study is based on preserved documentation from the municipal laboratories of Santiago de Compostela and A Coruña.[110]

The first recorded analyses of the Municipal Laboratory of Santiago de Compostela date from 1907. It is actually a list of sanctions applied to merchants for poor-quality food that year, eighteen of which were fines for watered-down milk. However, there was no thorough attempt to monitor the milk supply until 1921. At that point, the city government saw the need to establish a general registry of all the milkwomen who came into Santiago, assigning a number to each jug. In A Coruña, the first analyses were done by a pharmacy in 1911, but the city did not consider installing a laboratory until 1928. The documentation reveals the urgency with which it addressed the task at that point, because the facility was functioning by 1930. Until then, the city did not register milkwomen or systematically analyse milk.

Table 5.2. Number of monthly milk analyses in Santiago de Compostela and A Coruña

Santiago de Compostela												A Coruña	
	1907	1910	1913	1914	1916	1925	1929	1930	1931	1932	1933	1930	1935
January			1	89						10	45		17
February			12								32		19
March			139								41		12
April										63	36		19
May		92								49	37	11	23
June	18							13		36	21		19
July							24		47	12	36		22
August			345		180	12			66				14
September			45							11		37	3
October										30		59	14
November			2			12				32		15	2
December										60		12	16

Sources: For Santiago de Compostela: Carpetas 'Multas por leche aguada', Caja A.M. 2192 and Carpeta '1925-1933', Caja A.M. 2193. Fondo Sanidad. Archivo Histórico Universitario de Santiago de Compostela. For La Coruña: 'Expedientes sobre reconocimiento por el farmacéutico municipal de varios jarros de leche' Caja 7545. Fondo Sanidad. Archivo Municipal de A Coruña, Legajo 00 'Laboratorio Municipal – Partes de Inspección de Alimentos' Caja 5153, Fondo Sanidad. Archivo Municipal de A Coruña. (Blank cells mean "zero analyses")

[110] The two most important Galician cities at the time. Santiago de Compostela had 24,120 inhabitants in 1900 and 38,270 in 1930. A Coruña had 43,971 inhabitants in 1900 and by 1930 had reached 74,132. The Santiago de Compostela laboratory, founded in 1891, was one of the first in Spain. The A Coruña city hall did not make the decision to install a laboratory until 1928.

Table 5.3. Number of milk analyses and results by decade

	Santiago de Compostela					A Coruña				
Quality	Good	Adequate	Poor	Total	%Poor	Good	Adequate	Poor	Total	%Poor
1901-10	41	40	29	110	26.3					
1911-20	651	75	23	749	3.2			9		
1921-30	20		17	37	45.9					
1931-35	547		141	715	19.7	216	41	58	310	18.7

Sources *1901-10*: for 1907-1910: Carpetas 'Multas por leche aguada', Caja A.M. 2192. Fondo Sanidad. Archivo Histórico Universitario de Santiago de Compostela. *1911-1920*: Carpeta '1925-1933', Caja A.M. 2193. Idem., and 'Expedientes sobre reconocimiento por el farmacéutico municipal de varios jarros de leche -1911' Caja 7545. Fondo Sanidad. Archivo Municipal de A Coruña. 1921-1935: Carpeta '1925-1933', Caja A.M. 2193. Fondo Sanidad. Archivo Histórico Universitario de Santiago de Compostela, Legajo 00 'Laboratorio Municipal – Partes de Inspección de Alimentos' Caja 5153, Fondo Sanidad. Archivo Municipal de A Coruña. (Blank cells mean 'zero analyses')

Thus, we can see that from the beginning of the century, incoming milk began to be a municipal concern in these cities, and timid attempts – even for that time – were made to regulate this product. In Santiago de Compostela, public health technicians began recording all samples taken, the name of each milkwoman and analysis results in 1910. The preserved bulletins show that during that decade, analyses were not done regularly or throughout the year. In Table 1, we see that 100 samples were taken annually, but concentrated into a single month. However, 1913 constitutes an exception and is the only year for which we have a complete annual record. A few samples were taken throughout the year, accompanied by high numbers of analyses in March and especially August. A Coruña first addressed milk quality in 1911, when a local chemist was commissioned to do nine analyses in August, when the heat most endangered milk quality, as was described in the results.[111] Another step was taken in 1913, when a veterinary corps was organized to inspect milk by districts.[112]

By 1930, efforts at regulation became more methodical and stable. In Santiago de Compostela, a registry established in 1921 marked an important step for the city administration. It reflected the need to act more effectively, given the increasing numbers of milkwomen entering the city. However, the sparse documentation indicates that analyses during this decade maintained their prior pace, and samples were only taken in one or two months of each year. This changed in 1932, when health technicians began taking more samples systematically, every two weeks throughout the year, averaging 40-45 analyses monthly. In A Coruña, we find the same tendency. Once the laboratory was operative, analyses were done weekly throughout the year, but until 1935 fewer samples were taken than in Santiago (average of 16 per month). From the earliest official registries, each analysis was identified with the name of the milkwoman and the number of the jug from which the sample was taken. In the absence of a

[111] 'Expedientes sobre reconocimiento por el farmacéutico municipal de varios jarros de leche'. Caja 7545. Fondo Sanidad. Archivo Municipal de A Coruña.
[112] 'Expediente sobre reconocimiento de leche que se expende a la población a fin de decomisar la que se encuentra alterada'. Caja 7545. Fondo Sanidad. Archivo Municipal de A Coruña.

complete registry that would indicate exactly how many milkwomen supplied these cities, we estimated this data using the highest number that appears in the bulletins.

In Santiago de Compostela, we know that at least 923 milkwomen were registered in 1925 and the number had increased to 1,420 by 1931. In more populous A Coruña, there were at least 3,009 registered milkwomen in 1935. Neither city had urban cattle facilities, nor was milk brought in from other regions by train. Thus, supply depended completely on the milkwomen, and their increasing numbers would reflect increased demand.

In the early twentieth century, the liberal Spanish state did not actively intervene in the milk supply or in promoting consumption, as occurred in the second half of the century. This depended more on local agricultural providers and city governments that wanted to ensure the quality of the milk supply. In the 1920s increasing consumption created a deficit of milk and dairy products in Spain.[113] National associations such as the General Livestock Farmer's Association of the Realm (*Asociación General de Ganaderos del Reino*) responded by demanding greater state implication in fostering milk production.[114] During that liberal era, however, the state did not promote 'productivist' projects or have the capacity to do so, as it did in the second half of the century (Fernández, 2007: 327-344). Instead, initiatives to increase milk production emerged from family-based agriculture: not from a state-driven productivist dynamic, but from attempts to take advantage of increasing milk demand. Farming families were aware of what was happening around them and responded to increasing consumption by sending more milkwomen to the urban centres, where demand was highest. In the 1920s, this growing tendency led to new formulas for commercialization, appearing the first cooperatives. It also implicated new actors, such as technical experts and agrarian organisms for improving dairy production.

First of all, Galicia had an important cheese tradition in specific areas. It was habitual to make cheese for self-consumption in remote areas, as one more product that could be obtained from milk. From this, many families' cheese-making enterprises originated that by the 1920s were reaching markets across the peninsula and were present in the trade fairs for state agricultural products.[115]

Along with this, four dairy cooperatives were established in Galicia in the 1920s. After gathering milk from local producers, cooperatives distributed it in the nearby villages. Peasants themselves founded these cooperatives and rapidly adopted technological innovations that clearly demonstrated their capacity for growth. For instance, the Laíño Cooperative was able to process 1,500 litres of pasteurized milk every day, which was sold in nearby villages and in the town of Santiago de Compostela.[116]

In the field of cattle improvement, in the early twentieth century, cattle contests organized by agrarian societies to accelerate cattle improvement became increasingly

[113] Estadística General de Comercio Exterior de España (1926-1927, 1935). Dirección General de Aduanas. Madrid.
[114] Leche, queso y manteca: Estadística de la producción en España. Asociación General de Ganaderos. Madrid. 1925
[115] Rof, J. *La producción de la leche y sus derivados en Galicia*. Cátedra de la Producción Pecuaria de Galicia. 1953 and "El queso gallego" by Juan Rof Codina in biweekly newspaper *El Faro Villalvés* Nº 13. 1932
[116] Laíño is a parish that belongs to the municipality of Dodro, located in the South of the province of A Coruña. Rof, J. *Cooperativismo.* Talleres Tipográficos Ruíz de Lara, Cuenca. 1932 and different news between 1927 and 1933 in the daily newspapers *El compostelano* and *El Pueblo Gallego*.

commonplace throughout Galicia.[117] In the 1920s, agricultural researcher and geneticist Cruz Gallastegui, director of the Biological Mission – one of the main research organisms in Galicia – made strides in this area by promoting dairy production contests (Fernández, 1992: 297-298; Conde, 2015: 95-96). The objective was to identify the best milk cows and monitor their offspring, using the novel system of genealogical record books. Implementation of this project depended largely on the public organism that financed and organized the contests: the provincial government of Pontevedra, where the Biological Mission facilities were located. It monitored dairy production from 1923 to 1929.

At another major agricultural research centre in the region, the Experimental Farm in A Coruña province, director Leopoldo Hernández Robredo began work in 1933 on a programme to improve dairy production (Fernández, 1992: 293-294). Unlike Gallastegui, he directly crossed local cattle with Schwyz cattle, another multi-purpose Swiss breed but with better milk production than the local breeds.

Records from this organism indicate that after importing several head of Schwyz cattle, the programme remained active until 1939, resulting in a significant number of cross-bred descendants.

These improvement programmes were autonomously initiated by local researchers, unaffiliated with any state projects or stipulations from the Ministry of Agriculture. The decentralized research framework enabled the directors of the two centres to promote projects adapted to the dynamics and possibilities of each area (Fernández, 1992: 105-161; Fernandez, 2007: 109-154). The agrarian experts at that time understood farmers as innovators and sought improvements adapted to productive needs as well as to the reproductive circumstances of farming families. The dairy improvement projects discussed here fit perfectly with this premise. While seeking to improve dairy production so that farming families could take advantage of increasing demand, the formulas proposed by Gallastegui and Hernandez Robredo also prioritized maintaining multifunctional capacities in cross-bred descendants. The ideal: to increase milk production in cows that were also robust for work and had good offspring. Otherwise, farmers would not adopt external technological improvements. Neither agronomist pursued increased output at any cost. Accordingly, neither made recourse to the Friesian breed, the clear choice for an exclusively productivist objective. In fact, there were no Friesian cows in the region during the first three decades of the twentieth century.[118] They appeared in the 1940 as the first indicator of a change of course in agrarian transformation (Fernández,1992: 300).

The facts presented thus far lead us to attribute a much more relevant role to milk in Galicia than was previously assumed. Far from being overshadowed by meat production, an innovation dynamic was emerging that combined endogenous productive improvement with cooperative formulas for commercialization. Though very embryonic – with only a handful of cooperatives and early experiments in dairy improvement – it invites us to ask what might have happened if the Civil War had not interrupted it. Associated lines of research and cooperatives

[117] Cajas 61/442 and 61/443 in Dirección General de Ganadería (Libro 1.1), Fondo Ministerio de Agricultura (11), Archivo General de la Administración. Madrid, 1910-1916. See also Conde (2015: 49-57).

[118] From the 1920s on, merchants and private enterprises based in Madrid and Barcelona were importing Friesian cattle for urban dairies in those cities and dairy regions in the north of the Peninsula (Cajas 61/676 -678-685-694-696-702-705 in Dirección General de Ganadería (Libro 1.28 -1.30), Fondo Ministerio de Agricultura (11), Archivo General de la Administración. Madrid). For Galicia, we only know of one cattle importer in the northeast who advertised Friesian cattle (Fernández, 1992: 299).

disappeared in the wake of that conflict, but the issue of dairy improvement did not. It was taken up afresh with new formulas that aligned with quite different objectives.

III. Innovation demolished: Agrarian modernization projects in early Francoism (1940-1955)

The Spanish Civil War put an end to all prior research lines and marginalized most of the practising agrarian technical experts. The entire innovation structure that had been emerging and spreading – the integrated effect of family-based agriculture, agrarian technical experts and research centres – was dismantled (Fernández 1988: 244-246; Fernández, 1992: 463; 2007: 217-231). In this new regime born of a coup d'état, Francoist victory and the construction of the New State also entailed a project for agrarian renovation based on a logic of breaking with the past (Lanero, 2011: 432). It established the productive objectives of post-war agricultural policy along with the modernization and industrialization deemed necessary to achieve them. In reality, the new policy was nothing more than an attempt to fulfil the decades-old aspirations of 'educated agriculture'. These were embodied in the General Livestock Association of the Realm, for example, or the earlier engineers who drafted the first statistical records on cattle in 1891.[119]

In Galicia, the modernizing intent of the Francoist agrarian authorities was on display at the 1944 Agricultural Congress of Galicia, a publicity event to present the lines of action for modernizing the agrarian sphere (Bernárdez, 1999: 85-95; Lanero, 2011: 433-438). The agrarian leaders in this new project made milk a central issue, which clearly indicates the relevance it had been acquiring in prior decades. The difference, with respect to the former innovation pathway, however, was the intent to improve dairy production by following strictly productive criteria. For the first time, the concept of *dairy specialization* of cattle appeared in Galicia, but at this moment in the Galician countryside the conditions were not in place for directly implanting the Friesian breed. Peasant families could not use them for work, nor could they manage to feed them adequately to get the best production.

Improvement efforts would focus on enhancing the dairy aptitudes of the local *Rubia Gallega* breed, using Gallastegui's earlier experimental method of selecting cows in dairy contests and monitoring production of offspring.

Monitoring of dairy production in the four Galician provinces had begun in 1940, four years prior to that Congress, and could be considered the first state intervention in dairy cattle improvement. In 1933, the recently created General Livestock Directorate had officially established a Dairy Yield Verification Service (*Servicio de Comprobación de Rendimiento Lácteo*) in the northern provinces of the peninsula that functioned in the same way as the Genealogical Record Books implemented by Gallastegui in the 1920s.[120] Provincial Livestock Development Boards (*Juntas de Fomento Pecuario*) had been established in Galicia and tasked with registering livestock. Official veterinarians from these organisms tried to get farmers to identify the best dairy cows.[121] After the 1944 Congress, dairy registry became a fundamental line of work, along with expansion of meadows and cattle fodder crops.

[119] La ganadería en España: Avance sobre la riqueza pecuaria en 1891. Junta Consultiva Agronómica

[120] The *Dirección General de Ganadería* belonging to the *Ministerio de Agricultura* had been created in 1931 as the maximum state authority on livestock issues.

[121] Caja 61/414 - Legajo 390, Dirección General de Ganadería (Libro 1.1). Fondo del Ministerio de Agricultura (11), Archivo General de la Administración. Madrid.

The project announced in the Agricultural Congress materialized as the Agricultural Plan for Galicia. It included the Bovine Selection Service, which handled dairy registry in the four Galician provinces. The funding difficulties, the turf wars between organism directors and the feeble results of the initial project have been studied extensively (Bernárdez, 1999:117-142; Fernández, 2007: 247-251; Lanero, 2011: 473-479). The Dairy Yield Verification Service, though independent from the Agricultural Plan for Galicia, faced similar problems and followed a parallel trajectory. The veterinarians responsible for reporting results emphasized the difficulties in doing the verification work. This was largely due to personnel shortages and the unwillingness of farmers to register their cattle for fear of confiscation, which had been commonplace during the war and early post-war years.[122]

Dairy improvement of traditional cattle was not at all hegemonic. Contrary to the aims of official improvement policy, husbandry stations for crossbreeding with Simmental bulls persisted across Galicia.[123] Meanwhile, actions for modernizing dairy improvement came nowhere near fulfilling their objectives. Thus, not only had the work of pre-war agrarian experts been interrupted in this sphere, but the new top-down project also failed.

Furthermore, as part of its production intervention strategy, the state attempted to organise the milk supply to cities by creating a National Plan for Milk Distribution Centres (Langreo 1995: 158-163; Calcedo, 1996: 236-237). But implementation was very slow and in Galicia, these Milk Plants were not even operative until the mid-1960s. This favoured the growth of private milk companies, some of which had been established in the 1940s. The first dairy transformation industry, *Ilepsa*, was founded in 1939 as part of Nestlé, to produce condensed milk. Next, the *Larsa* cheese factory was set up by local entrepreneurs. After that came *M.G.*, which belonged to a cheese industry in the neighbouring region of Asturias. These factories monopolised milk supply and transformation, expelling local families of breeders from this activity. For unknown reasons, we have lost all trace of the few cooperatives that existed prior to the Civil War. The new cooperatives had to integrate into the corporative structures of the regime, such as UTECO (Territorial Union of Rural Cooperatives). The most prominent case is the Leyma cooperative which owned Central Lechera, the Milk Distribution Centre that supplied the city of A Coruña. There were other small attempts to start cooperatives with state support, but most of them could not withstand the strong competition in milk collection from the large companies just named.

In 1955, the Agricultural Plan for Galicia stopped working with dairy registries for local cattle to implement new diary improvement formulas. At the Agrarian Congress organized by the Official Agrarian Union Chamber of A Coruña in 1955, it was clear that the 1940s defence of local cattle selection had been abandoned to pursue crossbreeding with foreign varieties.[124] We should understand recovery of this formula as an attempt to remedy the deficiencies of the prior project. Production criteria remained the same, but the focus shifted to accelerating cattle improvement to meet production needs more quickly. Curiously, it had almost been forecasted ten years earlier by César Fernández Quintanilla, the agrarian engineer responsible for the cattle improvement project of the 1940s, in this interesting quote:

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[122] Idem.

[123] Significantly, the Civil Government of A Coruña did not agree to eliminate official and private breeding stations with Simmental bulls until 1952. Caja 55/24214, Carpeta 'Datos estaciones pecuarias y paradas para las memorias de la D.G.G. en 1966', Dirección General de Ganadería (Libro 1.28 -1.30), Fondo Ministerio de Agricultura (11), Archivo General de la Administración. Madrid.

[124] Gómez De Azcárate, J.; and Gómez, J. Ponencia *Ganado Vacuno*. Cámara Oficial Sindical Agraria de La Coruña – Plan Agrario de 1955. Centro de Investigaciones Agrarias de Mabegondo, 1955.

> 'If tomorrow we find that the local cow did not give everything we expected, it will not have done any irreparable damage (…) the crossbreeding that will have to be assessed at that point would be quicker and much more effective'. [125]

Economic history has interpreted the autarky period as a shutdown of economic development, describing it as 'twenty lost years for agriculture and cattle farming in productive terms' (Calcedo, 1996; Martínez, 2000; Domínguez 2001a: 57-62; Domínguez, 2001b: 42-43). Measures taken in the late 1950s began the recovery from this parenthesis. However, and in agreement with Fernández (2007: 344-348), we should not understand the Francoist agricultural policies of the late 1950s as the reactivation of a pre-Civil-War process. Rather, modernizing measures were enhanced at this time to achieve productive objectives based on actions more aligned with Green Revolution criteria. Milk industries also became active agents in the modernization process and played a role equivalent to that of the state in transmitting agrarian technologies to farmers. Ilepsa implemented such strategies from the beginning by subsidizing breeders who were more receptive to the purchase of cattle or to expanded grazing (Iturra, 1988: 38-48).[126] From the end of the 1950s, both Ilepsa and Larsa actively participated in cattle improvement projects. They funded two centres for monitoring milk production and promoted cattle contests.[127] After they were dismantled in the 1940s, the new model only increased the distance from pre-war innovation dynamics.

Accordingly, in 1956 the General Livestock Directorate began to import cattle breeds-for experimentation: the Schwyz (imported before the war) and South Devon – both rustic, mixed-aptitude milk and meat breeds – and the more demanding Dutch Friesian with exclusive dairy aptitudes.[128] The rather different characteristics of these cattle reflected two improvement proposals. The first South Devon head were sent to a research centre in the Galician interior, which had a dry, harsh climate and less meadowland. The objective: extensive breeding with local cattle to improve milk and meat production. However, only a few bulls were sent to the artificial insemination centres in the Galician interior.[129] In the end, the South Devon and Schwyz improvement options were more of a temporary solution to increase production without compromising the rustic features and work capacity still needed by farming families. As funds and conditions permitted, the Francoist authorities worked to spread Friesian cattle across the region, through direct distribution or breeding with traditional cattle. Massive implantation of this breed marked the definitive break with the innovative logic of family-based agriculture and the advent of a new agricultural model that answered to the productive rhythms and needs established by the processing industry or the state.

IV. Promoting the dairy breed to 'modernize the countryside': consolidation of dairy specialization (1960-1975)

By the 1960s, Friesians were a familiar breed in Galicia. In fact, the Local Board for Livestock development in Santiago de Compostela had used Friesian bulls in its breeding

[125]Fernández, C., *Apuntes para un estudio de la mejora vacuna en Galicia* (Borrador). Carpeta 'Mejora Vacuna en Galicia 1939-1959'. Centro de Investigaciones Agrarias de Mabegondo.
[126]Interview with Francisco Díaz Santalla, technical adviser of Ilepsa's Department of Agrarian Developmet (1976-2012).
[127] "El Primer campeonato Regional de rendimiento lechero de la raza vacuna gallega Rubia" (Interview with Benito Fernández García Fierro, Provincial Chief of Livestock) in daily newspaper *La Noche* (4/02/1957) and "Lalín" (cattle contest report) in daily newspaper *La Noche* (10/10/1959)
[128] Caja 55/24214, Carpeta "Importaciones frisona". Fondo Ministerio de Agricultura (11), Dirección General de Ganadería (Libro 1.28 -1.30) Archivo General de la Administración. Madrid.
[129]Fernández, C., *Boletín Español de la raza South Devon.* Centro de Investigaciones Agrarias de Mabegondo. 1958.

stations during the 40s.[130] Another report from 1944 indicated that 11% of the cattle in a municipality in southwest Galicia were crossed with this breed.[131] These small manifestations reflect Friesian crossbreeding based on the innovative logic of farming families. In the 1960s, however, the Francoist authorities attempted the rapid and massive implantation of this breed. In this section, we will follow the actions involved in this undertaking, using documentation from state organisms such as the General Livestock Directorate, and organisms in the corporative framework tasked with local implantation. These include the Official Agrarian Union Chambers (*Cámaras Sindicales Oficiales Agrarias*, COSA,) at the provincial level and the Union Brotherhoods of Land and Cattle Farmers (*Hermandades Sindicales de Labradores y Ganaderos*, HSLG) at the municipal level.

In 1959, documents sent from COSA to the HSLG, informed of the plan to import Dutch Friesians, 'as the breed with highest milk production and therefore highest yield to the farmer'.[132] It intended to import 'five or six thousand Dutch head and even more if demand is greater. The Ministry of Agriculture has great interest in establishing a strong dairy cattle nucleus in our region'.[133]

The cattle had to be requested by the peasant families themselves; the state paid for half the price of each head and its importation. Before the cattle was handed over to the farmers, veterinarians and agricultural experts would verify that the petitioners met the necessary conditions for the survival of the animal. Because these cattle were brought in as an experimental project, the contract conditions were very demanding for the farmers, especially concerning animal nutrition and hygiene.

This is not surprising if we understand Friesian cattle as an exogenous technology being implanted with all haste in an adverse environment. The Friesian cattle came from damp, cool environments with more food available year-round and required special care to maintain their productive qualities. Thus, modernizing actions to increase feed capacity and adapt living conditions for a more demanding breed were considered necessary complements to importation.

> 'Importing select cattle and distributing it in the province without coordinating this activity with others to develop an effective cattle improvement plan, might show few results or even become a negative factor. For this, we understand that the importation of select cattle should be accompanied by these other improvement actions.'[134]

To this end, many state actions were carried out across Galicia. In the province of A Coruña, for example, a specific modernization plan was implemented in 1960: Plan for Agricultural Expansion of A Coruña. This *comprehensive agricultural modernization package* used subsidies to promote the acquisition of Friesian cattle and the adaptation of farms to create adequate conditions for establishing them in rural Galicia. To address nutrition, land was tilled to make artificial meadows and increase fodder corn crops, the staple food of the new breed. Pesticides and fertilizers were promoted to treat these crops, silos were built to store grass, and new machinery was acquired to process grass and corn. The plan also supported the

[130] I.U. 061/002 Carpeta *Junta Local de Fomento Pecuario. 1932-1943.* Archivo Histórico Universitario de Santiago de Compostela.
[131] Cited in Fernández, C., *Apuntes para un estudio de la mejora vacuna en Galicia* (Borrador). Carpeta 'Mejora Vacuna en Galicia 1939-1959'. Centro de Investigaciones Agrarias de Mabegondo
[132] Communiqué 20/60 of the Cámara Oficial Sindical Agraria de la Provincia de la Coruña to the Hermandades Sindicales de Labradores y Ganaderos. Arquivo do Reino de Galicia, A Coruña, 1959.
[133] Idem.
[134] Communiqué 8/60 from C.O.S.A. to H.S.L.G., A.R.G. A Coruña, 1960.

construction of new stables with trenches for processing excrement into liquid manure. Milk companies had an active role in achieving these objectives by allocating significant resources to fund research projects to increase the productivity of pastureland. During the 1960s, Ilepsa financed two demonstration fields in strategic areas along with research on grazing lands, conducted by the agronomist Valeriano Yepes.[135] Cattle nutrition was a primordial issue for dairy transformation companies. They – especially Nestlé – dedicated ample human and economic resources to increasing production from peasant families. Factories also invested significantly in refrigeration technologies. As with other technologies in the early 1970s, private industry collaborated with state funding to finance a network of community refrigeration sites in parishes where significant amounts of milk were already being collected or where a production increase was expected.[136] This milestone technology forever transformed dairy systems and collection capacity in the rural context.

Returning to the topic of imports, documentation from COSA and the General Livestock Directorate indicate that cattle arrived throughout the 1960s, to the extent that 606 head of Friesian cattle were directly imported and ceded to farm families in 1969.[137] However, we will see that the spread of Friesian cattle depended more on the local efforts of research organisms and imports by private entities.

In this experimental venture, imported cattle was requested by interested farmers under an assignment contract. Alongside the farmer's obligation to provide adequate care, the state would subsidize half the cost of each head of cattle. In return, the farmer would give the first female calf to the research organisms when it reached nine months of age. The goal was to recover calves and create select Friesian cattle centres. For every imported head, the state received another without cost which had been raised by the farmer, which could be ceded under the same contract conditions to another farmer (and at fourteen months it could give birth).

The research organisms also controlled lineage through genealogical records and by monitoring milk production. In this way, they could propagate controlled, select bloodlines on the farms that had initially acquired the cattle and eventually on other farms throughout the province.

The following data from A Coruña province illustrate how select cattle multiplied under the control of the agrarian organisms.[138]

[135] Interview with Francisco Díaz Santalla, technical adviser of Ilepsa's Department of Agrarian Development (1976-2012).
YEPES V. *Praderías Artificiales.* Diputación Provincial de La Coruña
[136] Interview with Francisco Díaz Santalla, technical adviser of Ilepsa's Department of Agarian Development (1976-2012).
[137] Caja 55/24233 a 55/24238 Carpeta 'Partes de cesiones y recuperaciones'. 1969-1972. Dirección General de Ganadería (Libro 1.28-1.30), Fondo Ministerio de Agricultura (11), Archivo General de la Administración, Madrid.
[138] Caja 61/12837, Carpeta 'Memorias del Servicio de Libros Genealógicos y comprobación de rendimiento del ganado', D.G.G. (Libro 1.03 -1.05), Fondo Mº de Agricultura (11) A.G.A. Madrid.

Table 5.4. Friesian cattle registered in the genealogical books

	1964	1965	1966	1967	1968	1969	1970
Collaborating farmers	385	424	445	472	487	504	531
Recorded in the final registry for females	75	149	194	238	292	364	507
Recorded in the final registry for males	24	33	42	63	76	99	125
Recorded in the birth registry	665	1214	1214	1567	2359	3451	5138
Recorded in the auxiliary Registry (cattle recorded after the first registry was closed)	778	1204	1561	1919	2303	2013	3031
Total registered	1542	2380	3001	3787	5030	6527	8801

Source: Author's own based on data from the file labeled 'Memorias del Servicio de Libros Genealógicos y comprobación de rendimiento del ganado' Dirección General de Ganadería. Archivo General de la Administración. Madrid.

The number of registered animals and participating cattle farms grew as the decade progressed. Meanwhile, the agrarian organisms increased their livestock from 1,542 select animals registered in the Genealogical Book in 1964 to 8,801 in 1970

We must consider that these data refer only to heads imported by the state and that their destination was mainly the "Explotaciones Familiares Protegidas" ("Protected Family Farms").[139] This special category had been created by the state to promote farms where officials had identified good feeding and hygienic conditions, to place imported cattle there first. These owners fit well with the model of innovative smallholders who maintained close ties with the local elites and were well informed about favourable loan conditions for the acquisition of new agricultural technologies or cattle. Francoist authorities were particularly interested in promoting such farms and using them as models to encourage the spread of new technologies.[140]

However, the number of heads imported and managed by the state agrarian institutions was really small compared to the total number of imported heads. Private importers were actually more responsible for the spreading of the Friesian breed. In the following years, most breeder families gradually bought and incorporated imported heads, based on their own economic reproduction strategies and the profitability of milk.[141]

[139] Caja 61/3694 – Legajo 3010/3 "Informe resumen de la labor desarrollada por la Junta Coordinadora de Mejora Ganadera en el año 1959" D.G.G. (Libro 1.07), Fondo Mº de Agricultura (11) A.G.A. Madrid.
[140] Caja 5013, Archivo de la Diputación Provincial de A Coruña. A Coruña. 1956.
[141] Interview with Francisco Díaz Santalla, technical adviser of Ilepsa's Department of Agarian Development (1976-2012).

Along with the dissemination of these select individuals, the expansion of cattle with improved milk aptitude depended also on crossbreeding of Friesian bulls with local cows. We used General Livestock Directorate surveys of those in charge of the artificial insemination centres throughout the region from the mid-1950s on to assess the expansion of crossbred cattle.[142] The surveys were done in 1970 but contained information from the moment the centres were opened concerning the number of inseminations (unfortunately the breed inseminated was not indicated), the technical means available and the predominant breeds in each municipality. In 1970, pure Friesian cattle outnumbered the local breed in 14 municipal districts of A Coruña where nuclei for select individuals had been established. Crossbreeds and pure Friesians were distributed more evenly in the rest of the province.

Family farms began to replace their multifunctional native cattle with dairy cows to increase milk production as a family reproduction strategy for the future. This transformation happened at a different pace for each family farm and the "modern" family farms that emerged were more determined to adopt new technologies. The spread of refrigeration technology from the 1970s on – first through community refrigeration sites and later with individual cold storage tanks – accelerated this dynamic. As businesses increased their milk collection capacity, farmers sought to produce more. This drove dairy specialization among rural families and further concentrated the process in specific areas.

It explains why milk specialization occurred mainly in areas under the direct influence of the milk factories during the following decades. The state and private milk companies managed to reach their modernization objectives by occupying the void left by the breakdown of the peasant innovation model decades earlier.

V. Conclusions

Rather than being relatively insignificant compared to meat, milk was driving change from the early twentieth century on. This was implemented by the farmers themselves, though they are often characterized as reticent to change. Farming families demonstrated their capacity to respond to increasing milk consumption, first by sending their women to where they could sell it – long before there were registries, surely – and later by looking for new commercialization formulas, such as cooperatives. Technical experts assisted the trend by seeking to improve milk production in a way that prioritized adaptation to the needs of farming families over purely productivist ends.

The research structure understood farmers as innovators and sought to introduce endogenous improvements that fit with their logic. From our perspective, this confluence of farming families and research was creating an innovation dynamic that included both productive improvement of cattle and commercialization strategies to improve supply.

This dynamic was truncated in 1940s, when the state tried to mediate the process of agricultural change by defining from above the productive objectives, the pace for achieving them and the modernizing actions they entailed. However, we have seen that the state projects for improving milk production in the 1940s did not have the desired impact. Also, the implementation of a centralized supply system came late, at a moment when even the state was

[142] Caja 55/24217-18 Carpeta 'Informes sobre las visitas realizadas a los Centros de Inseminación', D.G.G. (Libro 1.28-1.30), Fondo Mº de Agricultura (11), A.G.A, Madrid, 1970.

leaning more toward private business initiatives. Whereas the pre-war innovation dynamic emerged from the imbrication of farmers and research, now it was occurring at the confluence of the state and recently established private industries. This enabled modernizing objectives to be met from the late 1950s on, giving dairy companies an active role in state modernizing projects. They accelerated implementation of new cattle formulas with imported, exclusively dairy breeds and the transmission of new technologies for crops, machinery, refrigeration… all aimed at achieving the highest yield from these new cattle. Implantation of this complete modernizing package sought to increase a surplus intended exclusively for new processing industries, generating dynamics that would increase the scale of dairy farms.

We can see that from very early on, agriculture in Galicia and other regions was subjected to an external modernizing influence that conditioned farmers to transform by adopting technology, based on what the rest of society required of them. The results and the implications of those agrarian change processes depended on the circumstances surrounding their adoption in relation to the state and industry as driving forces: with official organisms, research centres and technical experts as transmitters, and peasant and farmer associations as mediators and recipients. In examining the case of milk in Galicia, we distinguished two models of agrarian development. Though we found features of gradual transition between them, we do not think it discredits the idea of a rupture, due to the dramatically different circumstances in which they developed.

The state in the early twentieth century was only beginning to demonstrate its modernizing will and create pathways to transmit it. This was the function of the research centres with their agrarian technical experts. At that time, associations gave rural society mediating capacity to contend with external influences. This conditioned the agrarian experts and research organisms to create technologies adjusted to the needs of farmers interested in obtaining benefits – in this case from the demand for milk – but whose reproduction depended on the limitations of the rural context. The rupture came when these circumstances changed.

From the 1940s on, the state had clearer modernizing lines and projects. The old peasant associations lost their mediating role as the Francoist regime implemented new transmission pathways, such as the HSLG and the Agricultural Chambers, while also increasing the capacity for agricultural technology transfer. However, dairy transformation companies and private actors were actually more successful in achieving this objective. Dairy companies fostered technology transfer to adjust peasant production to their productive requirements through dairy specialization. Peasant families interested in the benefits offered by industry adopted these new technologies. This allowed them to overcome the limitations of the context and exploit it to achieve higher production. At that point, agriculture became subordinated to private industry, which provided production technology, and the dairy processing industry. This relates to current concerns over low agricultural prices and the survival of dairies.

Though we have identified two distinct processes, there were also continuities, as the modernizing influence was always driving change. Thus, when peasant families of the first period selected cattle that produced more milk, crossbred such cattle with selected heads or acquired specialized cattle, they were adopting a technology that caused them to see themselves as modernizers. When peasant families of the second period decided to specialize in milk production, it could be said that this innovation originated from within the families. Similarly, when the experts tried to improve the milk aptitude of traditional cattle or import breeds that would make it possible to preserve multi-functionality during early Francoism, it might seem that such improvements were mindful of the needs of families. What marks the difference, from our perspective, is that in the first case, this modernizing improvement originated in the peasant

context and responded to their needs, interests or logic. Thus, these changes were not so much modernizing as "innovative". In the second case, dairy specialization and the adoption of technologies on that scale may have been an innovation that families chose, but it was really induced by the state or industry, which leads us to understand it as an external or "modernizing" change. The same occurred with the introduction of multifunctional breeds. Experts during early Francoism still valued these cattle because they adapted to the needs of the families at that time, but this also met the productive objectives of the state and industry. Clearly there was a modernizing dynamic that continued throughout the twentieth century, but the circumstances in which it was applied gave rise to different transformations and implications: from maintaining peasant logic and relationship with the environment to ignoring or disregarding such logic and exploiting the environment. As we can see, studying the past has shed light on alternative development paths for agriculture that are not so far removed from the questions we ask today about sustainable food production or the demise of rural life.

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