

Commons, technical change and the market: the butter industry in the León mountain area (1857-1936).

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Abstract: The turning point in butter production in the province of León came about when the Sierra Pambley School was set up in Villablino in 1886 and the first Spanish butter cooperative was created there in 1896. The existence of dairy cows breeds and large areas of common grazing land and traditional forms of collective organisation enabled farmers to take better advantage of the work of institutions which fomented cooperativism and improvements in technical procedures, and of a market which was demanding more and more dairy products. That is, of the many factors which led to the rise of the butter industry, we must highlight the fact that we are dealing with an endogenous development process, based on local cattle breeds, traditional knowledge and forms of collective organisation.

Keywords: Commons Lands, Cooperatives, Butter Industry, Technical Change

1. Introduction

This paper is based on my doctoral thesis which examined the survival of commons in the Spanish province of León between 1800 and 1935 (Serrano 2006). In this thesis, when analysing the changes that took place with regard to common lands, it was shown that in some mountain areas in the province (Figure 1) significant changes had affected cattle farming. One of the most important was the increase in specialised dairy products, like butter, in the first third of the 20th century.

We must not forget that during the 19th century, the State, guided by a liberal political project which aimed to commodify land and production factors, had sold off a large part of village common property and taken charge of those lands which remained in the hands of the local communities (*comunidades vecinales*) (GEHR 1994; Balboa 1999). However, with regard to privatisation of village property, it can be seen that large common land areas survived in Spain's northernmost regions (GEHR 1994) due to different factors like social and environmental conditions (Beltrán 2010) or the consensus of all the members of the community in maintaining them (Iriarte Goñi 2002). In the province of León, despite the threat of the liberal State and the challenge involved in adapting to a market economy, not only did the common lands and the commons regime survive, but the latter, as in other areas in Spain (Iriarte Goñi 2002), was flexible enough to adapt to a changing economic context.

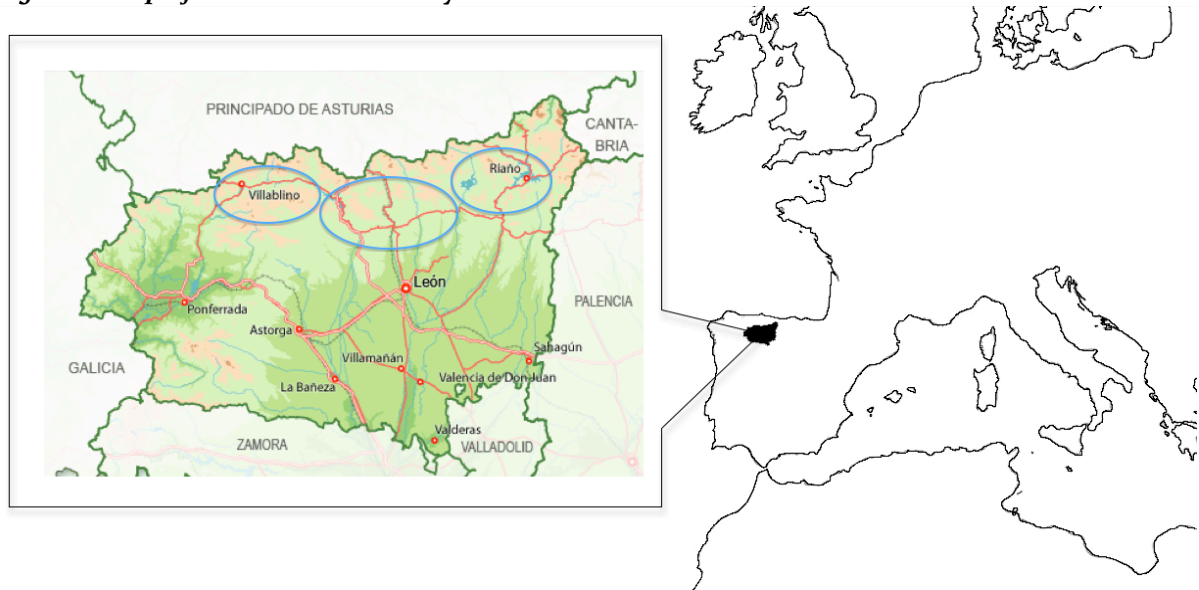
This paper aims to analyse in more detail what happened in the butter industry which developed in the first third of the 20th century. It is not an easy task, due to a lack of sources for research. The only information available are national or provincial statistics, unconnected witness accounts, and articles published in *La Industria Pecuaria* between 1908 and 1933. For this reason, this paper is a draft version presenting initial findings on the subject and the odd explanatory hypothesis. Initially, the idea was to focus on butter cooperatives, but as research progressed, we realised that it was not possible to determine the number of cooperatives that existed in the province of León, how they

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worked or how much they produced. However, it can be assumed that most of the butter produced in the León mountain area was either produced by cooperatives or by communal dairies, as we shall see below.

Figure 1. Map of the area under study.



The blue circles indicate the areas where the butter industry developed.

2. The butter industry in Spain.

In Spain, unlike other European countries, dairy products did not form part of people's normal diet until well into the 20th century and, therefore, the quantities consumed were very low; in 1927, for example, milk consumption was 100 grams per inhabitant, whereas in the United States it was 536 grams, in Denmark 370 and in Switzerland 580; in more than twenty Spanish provinces, milk consumption was lower than 25 litres per person per year (Anonymous 1928, 136). Milk was considered more as a product taken for medicinal purposes by sick children and elderly people, rather than as a daily food product (Nicolau and Pujol 2005) and butter made from cow's milk was a luxury product used in baking or consumed in affluent households. Animal fats like lard, and oil, especially olive oil, were used for cooking, among other reasons because they were much cheaper than butter. That is why butter consumption is not even included in official statistics. Whilst in other European countries like Germany, Holland and Great Britain butter consumption in 1914 stood at between 15 and 17 pounds per person per year (Pirtle 1922, 5), in Spain in around 1930 it stood at approximately 0.7 pounds per person per year¹.

Although butter had been produced and commercialised in the mountain areas of Asturias, Galicia, Cantabria and León from ancient times, until around the mid-19th century most of the butter consumed in Madrid and other cities came from the north of Europe (Esteban Collantes and Alfaro 1855); it was traditionally referred to as "butter from Flanders". Halfway through the 19th century, several producers in Asturias began to make butter imitating the salted butter from Flanders and in a few years they were able to produce more than enough to satisfy the demand from the domestic market (Caveda

¹ This figure results from dividing the total butter production in 1929 (GEHR 1991, p. 1200) by the total Spanish population in 1930.

1851, 366-7). Of the 33 butter factories in Spain in 1857, 29 were located in Asturias (Langreo 1995, 78).

From the middle of the 19th century in Spain there was a development of an industry which is able to supply the domestic market, but this has nothing to do with what happened in other European countries like France or Italy, and is very far removed from what happened in countries like Denmark or Ireland. At the beginning of the century there were only 32 cheese and butter factories in the north of Spain, according to the official statistics for industrial production (Table 1), whereas in other European countries there were thousands of dairy factories and cooperatives (Federico 2005, 170; Pirtle 1922).

3. The origins of the butter industry in the León mountain areas (1850-1915): the Escuela Sierra Pambley.

León was one of the Spanish provinces where cow's butter was manufactured, although in the mid-19th century, there was no dairy industry as such, and cheese and butter manufacturing processes were very basic (García de la Foz 1857, 11). Perhaps due to influence from the neighbouring Asturias, according to the Dirección General de Agricultura, Industria y Comercio (1892), by the end of the 19th century, butter from Villablino and San Miguel was exported via Galicia, and butter from Vegamián, Lillo and Riaño via Asturias and the port of Gijón to the Americas.

In the closing decades of the 19th century, Francisco Fernández-Blanco Sierra-Pambley, a rich landowner from León, together with several teachers from the *Institución Libre de Enseñanza* (G. de Azcárate, F. Giner de los Ríos and M. Bartolomé Cossío) established different schools in the province of León aimed at improving training in business and agriculture. In 1886, the first of these schools, the Villablino Sierra Pambley Business and Agriculture School was set up to perfect local agriculture and develop dairy industries, because cattle farming and agriculture were the main means of subsistence of the local people; and to improve business training in young people, many of whom were emigrating to cities like Madrid, Havana or Buenos Aires (Alvarado 1911).

With a view to improving cheese and butter production techniques, when the School was established, the teachers were sent to France to be trained themselves in butter and cheese production techniques (Reguero 2009, Cantón Mayo 1995). One of these teachers who trained in France was Ventura Alvarado, who studied at the *Mamirolle* National Dairy School between 1895 and 1896. He was taught there by the prestigious Pierre Dornic and received further training in other schools like the *La Brosse* School where acquired solid theoretical and practical knowledge². From then on, the Sierra Pambley School would become a model for many others³, even being mentioned in United States consular reports (Bureau of Foreign Commerce 1902, 110):

“The effects of the college are marked in every direction around the district, and some of the students, after terminating their courses, have formed a company and established in Villajed (sic) a butter manufactory upon the latest model, sending their products to Madrid and other important cities. This company also sends one of its partners to France or other advanced countries yearly to report on any improvements”

Ventura Alvarado and his brother Juan, who was the Head of the school, became the driving force behind the modernisation of cheese and butter production in Spain. They kept in contact with other people in with the same concerns and attended different dairy

² AFSP, *Legajo 18*. “Memoria del viaje de estudio hecho en Francia por Ventura Alvarado”.

³ “(...) in the village of Villablino, there is a dairy school, which is a true model among those of its kind and the only one in Spain” (Aragó 1909, 381).

industry conferences in Europe in order to keep up to date with all the advances in the field. They also published several books, as can be seen in the bibliography section of this paper, and numerous articles in *La Industria Pecuaria* on butter and cheese production, how to improve milk yield, or how to start up milk and butter cooperatives. In fact, in Villablino, in 1897, a cooperative association was formed with the support of the Alvarado brothers. Although this first one was not very successful, in 1915 they set up a new butter cooperative which became a model for many others in León and in Spain.

In 1911 the *Asociación General de Ganaderos* (General Association of Farmers) set up the Dairy Industries Development Service under the direction of Juan and Ventura Alvarado⁴. This enabled the Alvarados to give numerous practical courses in dairy production all over Spain. In these “practical weeks”, Ventura Alvarado, using machinery for all to see, explained how to work with milk and make it into cheese, butter and curd, how to analyse the fat content of milk, what temperatures to use, and many other practical aspects. In order to spread knowledge about cheese and butter production, as well as study how to improve local dairy production, they travelled to Cantabria (1911), Alto Aragón (1913) or the cheese-producing districts of Galicia (1920), about which there are several publications (Alvarado and Alvarado 1911; 1913).

Finally, we must point out that the Alvarados also encouraged cattle competitions to improve native cattle breeds and they supported other new initiatives. One of these initiatives was setting up a consulting service for the milk industry where they received enquiries from all over Spain⁵. Another interesting initiative was the creation in 1907 of a *Cooperativa de Seguros contra la mortalidad del Ganado* (Cattle Death Insurance Cooperative), which by its second year had 312 members who insured 2,550 cattle for a total value of 464,518.40 pesetas⁶. Another interesting proposal made by V. Alvarado in 1917 was to expand the Sierra Pambley School and create in grounds near the capital of the province –the Monte de San Isidro–, a centre with a laboratory for dairy research (chemical and bacteriological) and where cattle could be improved by means of selection⁷. One important aspect of this new project and one which illustrates the character of the Alvarado brothers, is that concerning the awarding of grants by the Monte de San Isidro Centre to enable poor students to study.

4. The growth of butter production in the León mountain areas (1915-1936)

There is no doubt that the origins of the modern dairy and butter industry in the mountain areas of León are to be found at the end of the 19th century in the area of Laciana, when the Escuela Sierra Pambley were founded. As we have already pointed out, the first cooperative association created in 1896 was not a success because of competition from the Villager dairy, which belonged to Marcelino Rubio, a former student of the School, and because the cattle farmers would not commit to providing milk in winter⁸. Despite this initial failure, in 1915 a new butter cooperative was set up and this time it was a success. It started out with 38 farmers who contributed a capital of 65,000 pesetas,

⁴ *La Industria Pecuaria*, 1911, 35-37.

⁵ AFSP, *Legajo 31*. “Consultorio de Industrias de la Leche de la Fundación Sierra Pambley”.

⁶ AFSP, *Legajo 16*. “Memoria del año 1908-1909”.

⁷ APSP, *Legajo 19*. “Grandes líneas de un proyecto de ampliación de la Escuela Sierra Pambley, que propone al Patronato de la Fundación, Ventura Alvarado y Albó”.

⁸ AFSP, *Legajo 5*. “*Memoria del año 1896-97*”. All the problems associated with the setting-up of the cooperative and the school can be found documented in the Fundación «Sierra Pambley» Archive, where the annual reports are also deposited; see also CANTÓN MAYO (1995, 263-267) and REGUERO (2009).

and after five years membership had grown to 246 (Alvarado 1923, 9). The farmers not only recovered factory building and installation costs in just a few years, but they also received a higher price for their milk; once they deducted factory installation and skimming station costs, the *Lacianiega Cooperative* farmers obtained a net payment of 18 cents per litre of milk, compared to the 14 cents per litre offered by Marcelino Rubio, the main local industrialist (Alvarado 1923, 10).

As a result of the Sierra Pambley School initiative, the mountain areas of León were filled with factories; by 1928 there were more than 23 butter and cheese factories in the province of León: they had 53 workers and had processed more than 4,600,000 litres of milk, as we can see in Table 1, which is based on Industrial Inspection Statistics.

Table 1. Butter industries in the province of León, 1926-28.

Name/Trade name	Location	Litres milk
Marcelino Rubio / La Lacianiega	Villager de Laciana (Villablino)	1,000,000
Marcelino Rubio	Múrias de Paredes	32,000
Cooperativa Babiana	Cabrillanes	30,000
Cooperativa Babiana	San Emiliano	150,000
Cooperativa de Quintanilla	Cabrillanes	25,000
A. Pérez / Cooperativa La Cueta	La Cueta (Cabrillanes)	7,000
Baldomero Castro	La Cueta (Cabrillanes)	5,000
Rosendo Alfonso	Anllares (Páramo del Sil)	10,000
Luís Miguel Manzano	Burón	5,000
V. Gutiérrez / La Boñaresa	Boñar	400,000
Vda. de Tomás Díez Canseco	Cármenes	180,000
Marcelino Hidalgo	Láncara de Luna	90,000
Pedro Álvarez	Geras (Pola de Gordón)	135,000
Eugenio Melcón	Abelgas de Luna	-
M. G ^a Lorenzana / Mantequerías Leonesas	San Emiliano	180,000
M. G ^a Lorenzana / Mantequerías Leonesas	Huergas de Babia	1,800,000
M. G ^a Lorenzana / Mantequerías Leonesas	León	2,000,000
Manuel Rodríguez G ^a	Lillo	90,000
Cándido Bayón	Rodiezmo	60,000
Teófilo Álvarez	Pobladura de la T. (Rodiezmo)	-
Tomás Rodríguez	Tonín (Rodiezmo)	35,000
Lorenzo Población*	Vegamián (Boñar)	30,000
Adolfo Rodríguez	Lario (Burón)	150,000
Adolfo Rodríguez	Riaño	150,000
Pedro Álvarez	Geras (Pola de Gordón)	36,000
TOTAL		4,600,000

* This is a cream producer. The total does not include the two million litres of milk used by *Mantequerías Leonesas*, as they have been included elsewhere.

Source: AHML, Secretaría (Inspección Industrial). Legajos 1.234 a 1245. "Estadística Industrial, 1924-1933".

Although the figures are important, we must point out that statistics on production are not very reliable. In the case of the statistics offered in Table 1, they come from a fiscal source, and as such, may be erroneous, among other reasons because butter production was a seasonal activity. The only thing that seems clear is that production reached its highest levels around 1925; according to different statistics, 6.1 million litres of milk were used for butter production and just over 300,000 kilograms of butter were produced (Medina Bravo 1930, 116; GEHR 1991; Asociación General del Ganaderos 1930). The statistics are not only inaccurate, but there are aspects which are not included, like, for example, the butter or milk produced in the León mountain area which supplied factories in Asturias; we only have to look at the fact that, for example, B. Domínguez Gil, a butter producer from Asturias, had two factories in the province of León -in La Robla

and Lillo- at the beginning of the 20th century (Langreo 1995, 107). We must also point out that the butter industry was limited to only a few mountain municipalities (Figure 1) and in this regard, the statistics and data added at a provincial level may be confusing.

If we look in detail at Table 1, we will see that only a few producers are cooperatives. However, we should make a few things clear here. The first is that the cooperatives grouped together a number of places; so, for example, in the case of the *Lacianiega Cooperative*, the factory was in Villablino, although there were skimming stations in other neighbouring villages which functioned like cooperatives. The second thing we must point out is that although the industrialists were private industrialists, production was carried out cooperatively⁹; that is, in some cases the industrialists installed skimming stations at the farm of one farmer and the rest of the farmers delivered their milk there (Langreo 1995, 300); in other cases, the locals made butter in communal dairies and sold it in 20-kilogram blocks to companies who took it away in lorries to the capital of the province or to Madrid. A third point has to do with sources. On the one hand, as we have already mentioned, we are examining fiscal sources, which may well hide information. On the other hand, the table includes the “producers” in existence between 1926 and 1928; due to different witness accounts, we know that cooperativism received a strong boost during the Second Republic with the support of the *Juntas de Fomento Pecuario* (Livestock Farming Development Boards) which, after 1933, “began to propagate collectivisation” (Martín Galindo 1961, 203); so, for example, in 1932, in the municipality of Palacios del Sil, three new cooperatives were set up in the villages of Matalavilla, Salentinos and Salientes, and another three in the municipality of Rodiezmo¹⁰; in 1936 in the area of Valdeburón there were also two cooperatives in Acebedo and La Uña (Martín Galindo 1961, 203).

The working system of cooperatives and communal dairies was very similar. In each of the cooperatives or communal dairies there was a worker in charge of taking delivery of the milk. This worker, in the presence of one of the members, measured and analysed the milk delivered by members and gave them a coupon indicating the number of litres deposited, the fat percentage of the milk, and the price to be paid. Each *vecino* (farmer) had a numbered bottle for analyses and a book where the worker wrote down the number of litres delivered. Every day, when the butter was made, the members were given the skim-milk or buttermilk they were entitled to and this was normally used to feed the pigs. At the end of the month, when the cooperatives were paid for what they had sold, the board paid each of the members what they were owed (Martín Galindo 1961).

As we can see in Table 1, the main butter producer was Marcelino Rubio, who had inherited the trade and the dairy from his father and a significant amount of butter from his father-in-law (Reguero 2009 and 2011, 222-8). One aspect worthy of mention in Marcelino Rubio’s biography is that he was a student at the Sierra-Pambley schools and received help from the dairy teachers to set up a modern dairy, as described here in one of the school’s annual reports¹¹. This industrialist, who also had businesses in Asturias,

⁹ In an article published in *La Semana Veterinaria* (p. 609), on September 4th 1932, reference is made to a study trip as follows: “*visitamos la renombrada fábrica de manteca de don Marcelino Rubio Rodríguez, hombre que desde hace treinta y cuatro años que la puso, no ha cesado en tal empresa y en la actualidad dice que posee 46 más, habiendo creado por otra parte 60 Cooperativas mantequeras*”.

¹⁰ AHML, Secretaría (Inspección Industrial). Legajos 1.234 a 1245. “*Estadística Industrial, 1924-1933*”.

¹¹ AFSP, *Legajo 7*. “*Memoria del curso de 1899 a 1900*”.

followed the methods promoted by the Sierra Pambley schools seeking to achieve quality production. To improve production processes, he sent his children to France to study and he became involved in improving local cattle and butter and cheese production, as can be seen by the many prizes he received in livestock competitions and by the medals he was awarded at National and International Exhibitions he took part in (Reguero 2009, 216 and 2011, 230; Langreo 1955). He commercialised cheese, butter and condensed milk under different brand names, and in the 1920s opened a store in Madrid called *Mantequerías Leonesas* where he sold Laciana butter (Reguero 2009, 221 and 2011); this business was carried on by his children, who went on to have around thirty shops in the main Spanish towns.

There were other important butter producers, who were also dairy sector industrialists, like Manuel Lorenzana or G. Martín Granizo, who, in 1945, joined forces with Marcelino Rubio's heirs under the trade name "Industrias Lácteas Leonesas S.A." (ILLSA). This company was the main dairy industry in the province for many years (Cámara Oficial de Comercio e Industria de León 1957). ILLSA had factories in León, Hospital de Órbigo (León), Cancienes (Asturias) and Reme (Lugo) and in 1968 it was bought by the American multinational group Kraft Foods.

5. Factors leading to the spreading of cooperatives and the butter industry in the Leonese mountains.

The changes in the cattle-farming sector in the province of León are integrated in a wider process of agricultural change similar to the changes in the Spanish economy and to those in neighbouring provinces. First of all, the relationship between the spreading of the cooperative movement and the *fin-de-siècle* agrarian crisis, which forced family economies to change and cling to a lifeline in the form of cooperativism, would seem to be clear (Martínez 1991). Secondly, there is a significant increase in the demand for dairy products and in prices, especially between 1916 and 1925: butter reached particularly high prices. Thirdly, a widespread milk industrialisation process takes place in Spain (Domínguez 2003). Apart from these temporary factors, there were others of a more structural nature which facilitated specialisation in butter production in the León mountain area; among these, we shall focus on the ecological environment and breeds of cattle which were orientated towards milk production, large areas of common lands, the community institutional framework and the model for technical change promoted by the Sierra Pambley school and the Alvarado brothers.

5.1. Changes in the international context

Taylor (1976, p. 592) points out that in countries like England the emergence of the dairy industry is proof in itself of the profitability of milk production in the final decades of the 19th century and early decades of the 20th. A profitability which in turn is the result of the coincidence of favourable trends both in demand and in production costs, which interacted and strengthened each other to the benefit of milk producers. It could be said that in Spain the emergence of the milk industry, and especially the butter industry, is also the product of a favourable trend in demand due to the outbreak of the Great War.

On the one hand, the Spanish market suffered a lack of supply of dairy products, which it had previously imported from countries involved in the War¹². On the other, the price

¹² "Prior to the outbreak of the European war much of the best grade butter was secured from France, but the increased cost of French butter and the higher freights for the Dutch and Danish product have resulted in the more general use of Spanish butter" (Department of Commerce 1916, 26)

of milk and dairy products increased, which boosted production; for example, in places like Seville, the price of butter of quality increased by 142 % (from 33 cents a pound in 1914 to 80 cents in 1916) and fresh butter increased from 50 cents to 95 (a 90% increase)¹³. Specifically, in the province of León, among the industries “*que merecen notarse y que se han instalado desde el comienzo de la guerra*” are three factories for the production of butter, as has been noted in a survey carried out by the Institute for Social Reform (Instituto de Reformas Sociales 1919, 239). It is no coincidence that the first butter cooperative in Spain, the *Lacianiega* Cooperative, was set up in 1915.

Thirdly, we should point out that during the first third of the century, the milk industrialisation process in Spain took place, with the development of an industrial centre in Santander (Domínguez 2003) and a strong boost for the dairy industry in the provinces of Madrid and Barcelona (Asociación General de Ganaderos 1930, 31).

Finally, we should note that this period also sees an increase in the cooperative movement, which was a stimulus for agrarian modernisation and a specially suitable tool for strengthening the capacity of technical change of the agricultural farm (Garrido 2007). On the other hand, cooperativism was the best possible way for the peasant economy to adapt in the face of the threatening challenge posed by the introduction in the countryside of mercantile economic practices without aiming to radically change these external determining factors (Martínez 1991).

5.2. Ecological environment: cattle breeds adapted to the environment and large common lands.

Halfway through the 19th century, León was a cattle-farming province, with breeds of cattle which were characterised by their rustic nature and their adaptation to the geographical environment (especially the diet of natural pastures) and the variety of products they yielded like milk, meat, manure, and work. Whereas in the more agricultural areas of the south and centre of the province the cattle were big and hefty and were used to work the land, in the mountain areas –Murias de Paredes, Riaño and La Vecilla–, the cattle were smaller and were used for work, meat and milk (Prieto 1900). That is, by the end of the 19th century and beginning of the 20th, some mountain areas had already specialised in breeding beef cattle and milk cattle. Towards 1880, there were milk cows in León which yielded 2 to 4 litres a day during half the year (Crisis Agrícola y Pecuaria 1887–1889, 547), but at the turn of the century there were cows yielding on average more than 7 litres a day during 7 months (Dirección General de Agricultura, Industria y Comercio 1892) and in mountain areas this yield could increase to as much as 12 or 16 litres a day (Prieto 1900). In 1926, many cows gave 14 litres a day, with a fat content of 9.50% (Junta Provincial de Ganaderos de León 1926, 4). Among these cows, worthy of mention is the “Leonese butter cow”, so called due to the high fat content of the milk it produced. It was characterised by its rustic nature and by being completely adapted to its mountain habitat and a diet consisting of abundant grazing pasture in summer and restrictions in winter.

Precisely in the mountain areas, space was organised according to cattle handling, and we must point out the exploitation of the so-called “Pyrenaic valleys” and the “*brañas*” which were typical of the Laciana district. The “*brañas*” were common lands located in the most protected part of the mountain where the cattle of all the *vecinos* were taken at the beginning of the summer to graze on the abundant pastures; each *vecino* had a barn to keep his cows, milk them and make cheese or butter (Díez González 1982). Despite the attacks on common properties throughout the 19th century in the form of

¹³ DEPARTMENT OF COMMERCE (1916, 27).

privatizations (*desamortizaciones*), the *vecinos* had maintained as collective properties most of the productive land, and especially grazing land. Therefore, in some butter-producing municipalities like Burón, Cabrillanes or Puebla de Lillo, the commons surface area around the year 1900 was more than 80% of the total surface area (Serrano 2006, 613-616). If we consider the fact that cow fodder and wages accounted for $\frac{3}{4}$ of the total production cost of butter (Taylor 1976, 593), in the Leonese mountains this cost was much lower, because cows were fed for free on the commons and milking was a family task. As we shall see below, mechanical skimming was a significant timesaver, and for a small investment, farmers could take advantage of the high prices paid in 1915 and the market demand for dairy products.

It should be pointed out that the specialisation in cattle-farming in the León mountain area derives from the existence of large common pastures but also from the existence and maintenance in the mountain area during the 19th century and most of the 20th of a strong common law which subordinated individual interests to collective interests. Despite the restrictions the common law rules imposed on economic activity, the existence of large common land areas was not an obstacle to market adaptation.

5.3. *The technical change model*

As has been indicated by Henrikson and O'Rourke (2005, 550), the price incentive is not the only explanation for the increase in butter production in Denmark, but the key factor is the creation of empirical knowledge. We could say with regard to the León industry that the technical change introduced by the Sierra Pambley School was a key factor to explaining the expansion of the butter industry in the León mountain area. That is, the Sierra Pambley School and the Alvarados were fundamental in spreading a "new" empirical knowledge which incorporated scientific practice and mechanical procedures to obtain more butter, of improved quality, more aromatic and with an improved appearance.

Also, in León in the 19th century, with greater or lesser degrees of success, different technical change initiatives had been introduced, like the León *Granja-Escuela* which was set up by the State and the Provincial Government, or the *Estación Pecuaria Regional de León*. These aimed to increase productivity of agricultural land by incorporating technical capital (machines, fertilizers, rotation, etc.) and improve the cattle-farming sector by incorporating foreign breeds and crossbreeding, cattle hygiene and feeding based on forage and fodder. It also aimed to spread this knowledge by holding demonstrations in other areas and supporting competitions for breeders, and by training farmers¹⁴. However, until 1933 the State and public institutions do not appear to have lent very much support to the butter industry.

Unlike these "official" initiatives, the Sierra Pambley School proposed a model of technical change based on the use and improvement of local conditions. In a letter sent to *La Industria Pecuaria*, the Alvarado brothers suggested three ways to support and improve Spanish dairy industries: first "improve the milk production of our cows, our sheep and our goats, that is, the milk production of our national milk cow breeds"; second "improve our traditional production processes"; and third, "prevent imitations and sales of false dairy products"¹⁵.

¹⁴ Cámara Oficial de Comercio e Industria de León (1935), pp. 31-32.

¹⁵ "Las industrias lácticas españolas", letter published by Juan and Ventura Alvarado in *La Industria Pecuaria*, 1909, p. 42.

With regard to the first point, the improvement in productions of native milk cows, we must remember that in the area of Laciana, where the Sierra Pambley school was located, the predominant breed of cow was the “Leonese butter” cow. In this regard, the Alvarados considered that certain Spanish native breeds were ideal for butter production, and they were particularly enthusiastic about the “Leonese butter” cow¹⁶; they considered it to be even better for butter production than other foreign breeds like the Jersey cow. Bearing in mind its potential for butter production, they became heavily involved in making it better, particularly through livestock competitions. Thanks to their influence in the *Asociación General de Ganaderos*, prizes for butter cows were created. We do not know to what extent all this improved the breed, but there is evidence to show that more and more cows giving milk with a higher fat content attended the competitions¹⁷; another person who was very involved in improvement of the “Leonese butter” cow was the industrialist Marcelino Rubio, the owner of *La Lacianiega* and *Mantequerías Leonesas*.

Through their publications, the Alvarado brothers proposed how to improve milk production in cows, recommending that farmers should study the milk production of their cows. They also insisted on the importance of improving feeding and conditions in which milk was stored (a clean stable, clean cattle, hygienic milking)¹⁸. Another of the Alvarados’ concerns was how to improve cattle feed, especially in the winter when the cattle were in the stables with minimum food rations¹⁹.

Secondly, the technical change model promoted by the Alvarado brothers proposes “modernising” traditional production modes. That is, they proposed adapting technology and scientific knowledge to local realities; as they pointed out on a visit to the province of Santander:

“The cheese and butter production carried out by farmers in their houses meant they are, without a doubt, the solid base the dairy industry in the province has to be founded on, because it is always easier and more feasible to improve industries which have been in existence from time immemorial than to create new ones”²⁰.

With regard to the butter industry, the starting point was the existence of an important butter manufacturing tradition in the area of Laciana. To some extent, it could be understood that traditional knowledge was one of the pillars on which the elaboration of cheese and butter was based; that is why, first of all it was suggested that these “traditional producers” should be heard; so, on their trip to Santander for example, the

¹⁶ “La leche”, an article published by J. and V. Alvarado in *La Industria Pecuaria* in 1912, pp. 54-58.

¹⁷ For example, at the competition organised in Riaño in May 1923 by the *Junta Provincial de Ganaderos*, the butter cows were much better than anyone could have imagined, as can be seen in the milk analysis table below:

Cow	Litres	Butter (%)
Nº1	11.50	5.30
Nº2	11.42	4.22
Nº3	11.38	5.25
Nº4	9.04	9.50
Nº7	13.08	5.50
Nº8	14.22	5.45
Nº10	10.84	6.10
Nº11	9.92	8.10

Source: Junta Provincial de Ganaderos de León (1926), pp. 3-4.

¹⁸ “La leche”, article published by J. and V. Alvarado in *La Industria Pecuaria* in 1912, pp. 54-58.

¹⁹ AFSP, *Legajo 2*. “Memoria del curso de 1894 a 1895”.

²⁰ Alvarado and Alvarado (1911, 21). Original text in Spanish.

Alvarados point out the importance of listening to the cow herds to “an explanation of ideas born from the experience of local farmers, because however many prejudices and errors there may be, there is something fundamental in everything that is heard” (Alvarado & Alvarado 1911). Secondly, they gave great importance to practice and experience; as they say in their book on milk cooperatives, all the notes, warnings and advice included here “are born from long practice in the matter” (Alvarado 1923, 31). One example of this is that in cheese elaboration they suggest keeping a “production book” so that if there is any problem the producer will be able to find out what happened (Alvarado 1926, 24).

If traditional knowledge was one of the pillars, the other was scientific practice, which had to be incorporated into all operations necessary to make butter and cheese (Alvarado 1921). Although according to the Alvarados the “lacioniego” method was unbeatable (Alvarado 1919), they did everything they could to introduce mechanical skimming and processing controls through the use of equipment like the acidometer which enabled producers to control levels of acidity and temperature before proceeding to extract the buttermilk. We must not forget that in order to acquire this scientific training, the Sierra Pambley School sent its teachers abroad every year “to obtain the latest acquaintance with the several advances made in these manufactures” (Bureau of Foreign Commerce 1902). That is to say, although the Alvarado’s proposed a model of change based on local realities, benchmarking is carried out to copy the best practices and products of other realities.

For the Alvarados, commercial interest should not be placed before scientific interest, as the most important thing was to achieve a product of quality²¹. In accordance with their point of view, the production of cheese and butter had to be based on knowledge and scientific practice; the cheesemaker and the buttermaker had to “have the necessary knowledge to carry out research on the qualities of the milk they receive and the qualities of the residues it leaves and that of the products they make” (Alvarado 1928, 159). That is, no cheesemaker should not know, for example, about milk composition, acidity, microbes, coagulation factors, whey draining factors and fermentation factors (Alvarado 1926). In this regard, their publications explain in simple language, but in great detail, how to carry out basic procedures like collecting samples or analysing acidity or fat content.

Juan and Ventura Alvarado also emphasised the importance of hygiene, pointing out that it is absolutely essential to work pure clean milk in butter production and especially in cheese production, and that is why we feel obliged to remind farmers of the need for cleanliness in milking as the basis for perfect elaboration” (Alvarado 1928 20). And with regard to hygiene, they promoted the use of equipment like the skimming machine, the butter churn and the *malaxer*, which, in addition to being more hygienic, saved on labour and increased butter production per litre of milk used (O’Rourke 2007a, 399).

Finally, the Sierra Pambley School and its teachers carried out important work teaching producers how to preserve butter. Traditionally it was preserved raw in the form of cylinders wrapped in cabbage leaves or it was stuffed into animal skins and cooked (Rof Codina 1916, 17). The Sierra Pambley teachers taught producers to salt the butter and pack it in tins which were sealed hermetically to prevent air getting in. The Alvarado brothers also promoted cold storage, that is wrapping the butter in waterproof paper and storing it in fridges with no light and little ventilation. One of the most outstanding things about the Alvarados is that they defended product quality and not tariff

²¹ “El estado de las industrias lecheras en la provincia de Santander”, an article by J. and V. Alvarado published in *La Industria Pecuaria*, 1911, pp. 234-5 y 261-3.

protection, although they do point out that imported products should be properly labelled and give information about whether they contain margarine or artificial butter (Alvarado and Alvarado 1911, 28-33).

Finally, and in relation to technical change, we should mention several related changes which boosted butter production and trade, one of which was the improvement in public transport services to major towns (Martín Galindo 1961, 202). Between 1875 and 1904 several roads were built which improved communication between León and other provinces; for example, the road from Sahagún to Arriondas (a town in Asturias, 65 kilometres from the capital Oviedo) put the mountain producing centres in contact with the consumer centres. Secondly, the railway was expanded; on the one hand communications between León and Madrid (the main destination of the butter produced in León) improved, and, on the other, inland transport improved with the creation of routes like the one from Villablino to Ponferrada. Thirdly, in the 1920s the lorry began to be used as a means of transport, and this allowed for butter to be collected and transported. Another important innovation was the expansion of electricity through common initiatives starting in the 1920s²², which allowed people to use electrical equipment like skimming machines or fridges.

5.4. *The institutional framework: cooperative work tradition.*

A less tangible aspect, but one which was influential and decisive in the “success” of the butter industry and expansion of cooperatives and common dairies, and, therefore, of the butter industry, was the common work tradition and shared values. Just as in other contexts, it could be understood that in León, as in Ireland and Denmark, the expansion of cooperatives took place where there were shared values (HENRIKSEN 1999, p. 76) or where there was a mutual help tradition (Ó’Gráda 1977); and, on the other hand, social and political conflicts hampered the expansion of cooperatives, which is what happened in Ireland (O’Rourke 2007b). Also trust in neighbours and social networks and personal ties built around the use and management of collective resources like common lands are crucial elements in the rise of the cooperative movement in rural areas (Beltrán 2012). However, in the case of León, it could be said that the main cooperatives were set in the traditional system of values; as V. Alvarado (1923, 13) pointed out, the basis of the cooperatives was the fair distribution of profits, which was linked to the sense behind common law (original text in Spanish):

“It does not matter whether they are large or small, but if the farmer sees that profits are shared out equally, he will be satisfied and will try as hard as he can to increase them, by improving his cattle so that they yield more, or by incorporating improvements in his premises with a view to lowering production costs and improving product quality, etc., etc., because he knows that the higher the increase in total profits of the cooperative, the relatively higher part he will receive of that increase. On the other hand, if he sees that profits, although higher, are not shared out correctly, he will soon become annoyed and display this annoyance in the form of private protest, which will soon become public protest, and then he will stop delivering his milk; after that will come loss of trust in the institution and it will probably disappear (...)”.

Another interesting aspect of the León cooperatives is that, just as in other contexts (Henriksen 1999, 65), the one-man one-vote principle was applied, which meant that the cooperatives were a means of defence of poor *farmers*”, as pointed out by V. Alvarado (1923, 28). Basically, the way they functioned was similar to that of the “*concejos de*

²² In around 1925 in many mountain villages, the *vecinos* had acquired electrical installations as can be seen in AHML, *Secretaría (Inspección Industrial). Legajos 1.134 and 1.124* “Contestaciones dadas por los Alcaldes sobre Estadística Industrial”.

vecinos”, the traditional form of government in the León mountain area where all the *vecinos*, as members of the community, irrespective of whether they were rich or poor, participated in all decision-taking processes. To a certain extent, the cooperatives were set up in line with a notion of legitimacy or “moral economy” which, despite existing inequality aimed to guarantee the interests of the less fortunate (Serrano 2005).

Although there is no question that social or cultural factors are behind the setting up of cooperatives, we must not forget the latter’s economic advantages. First of all, as we have already mentioned, and as pointed out by Henriksen (1999, 65) for the Danish context, cooperatives guaranteed better profits for the milk producers than the private dairies did. Secondly, cooperatives and common dairies allowed the cattle farmers to overcome the lack of capital, which was a very important problem²³; that is, most of the León cattle farmers had very few cattle and only gathered funds when they sold their harvests or cattle (Alvarado 1923, 11). Thanks to the cooperatives, the cattle farmers could put together capital to buy equipment like mechanical skimming machines, which enabled them to concentrate on butter production and led to important savings in labour costs. We must not forget that in the province of León there was no market for the sale of liquid milk and sending it to Madrid was very costly and took a long time. Thirdly, the cooperatives led to the creation of scale economies by enabling skimming machines and other equipment to work large amounts of milk; on the one hand, the small amount of milk produced by a small cattle farmer was not a problem; on the other, machinery and cooperative work led to timesaving. Finally, we can assume that the cooperatives were in a better position to obtain higher prices for their products than those obtained by individual farmers.

6. Conclusions.

Martín Galindo (1961, 202-3) said that before the Spanish Civil War (1936-1939) there was a cooperative in practically every village in the Leonese mountains, and that, because of the war and the post-war period, the cooperative movement almost came to a complete standstill. That is, the process of change which was taking place was halted by the energy conditions imposed, by changes in consumption –farmers produced products for their own consumption and not for the market-, by the fact that people returned from the towns to work in the country, or by changes in cattle-farming purposes.

However, a few years before the Spanish Civil War, the butter industry (and the dairy industry in general) were immersed in a deep crisis, among other reasons because after the end of the Great War, the European countries recovered the levels of dairy production existing before the war. Overproduction and the entry of production from other countries, almost non-existent import tariffs, dumping by foreign countries, and a devalued currency are some of the reasons given for this crisis, as can be seen in the constant complaints in articles published in *La Industria Pecuaria* between 1926 and 1933. It is true that competition from European butter and margarine, which were much cheaper, led to a dramatic fall in butter prices; so, for example, just before 1932 the price paid for a litre of milk was 30 cents and that same year the price in Asturias and León fell to 18 cents a litre, which led to a strike by dairy farmers in Asturias and they poured milk away for a month²⁴. To this we must also add the fact that it was becoming much more

²³ As pointed out by the Department of Commerce and Labor (1908, 103) on the dairy industry in the Cantabria area: “*The leading obstacle to the development of cattle raising in this district is the lack of capital. Few farmers own more than twenty or thirty cows, the majority of peasants possessing only one or two*”.

²⁴ For more on this subject see “Los efectos de un decreto. La manteca y la margarina” by V. Riesco, published in *La Industria Pecuaria*, 1932, pp. 9-10.

lucrative to sell liquid milk rather than sell it to industry; according to the Asociación General de Ganaderos (1930, 123) in León cow's milk for consumption was paid at 47 cents a litre, whereas milk for industry was paid at 37 cents a litre.

Although it is impossible to know the number of cooperatives in existence in the mountain area of León, what we have seen above would seem to contradict the Asociación General de Ganaderos (1930, 69), which claimed that the number of cooperatives could be counted on one hand. If we compare figures with those of other European countries, the butter industry in the mountain area of León could be seen as something purely anecdotic. On the other hand, if we consider that all these changes took place over a period of only twenty years, between 1915 and 1936, the figures are important; and even more so if we take into account that the changes took place in very few mountain areas.

What we have seen here shows that the pioneering work carried out by the Sierra Pambley School and its teachers Juan and Ventura Alvarado y Albó are fundamental in explaining the transformations that took place in the mountain areas. We have also shown how the existence of large common land spaces and the survival of common law did not prove to be a hindrance to technical change initiatives and specialised dairy and cattle farming. On the contrary, we can deduce that, as in previous times, common law rules were flexible enough to accept changes and allow farmers (*vecinos*) to take advantage of the positive economic situation with regard to cattle production. That is, the commons and the existing collectivist tradition did not constitute an obstacle to the adopting of innovations which adapted to the local context and were of benefit to all the *vecinos*; on the contrary, they seem to have helped to incorporate some of these innovations, like cooperative organisation. However, further studies are still needed to analyze what happened at the local level and to what extent these changes improved the income and living standards of the farmers and brought life to the León mountain villages.

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