

Milk, social acceptance of a new food in Europe: Catalonia, 19th-20th centuries

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SUMMARY: 1.—Introduction. 2.—The consumption of fresh milk between 1870 and 1936. 3.—The traditional uses of fresh milk. 4.—Milk for everybody. 5.—Milk and environment. 6.—Conclusions.

ABSTRACT: In this article we analyse the time course of the consumption of fresh milk in different regions of Europe between the 1870s and 1930s. Working from the case of Catalonia, we affirm that the increasing consumption of milk in that period must be especially linked to the spreading of new scientific knowledge in microbiology and nutrition that followed Pasteur's discoveries. We particularly highlight the information dissemination activities in this direction carried out by health sector professionals (medical doctors and pharmacists), governing local institutions and the milk industry. The initiatives developed by these groups changed people's preferences —fresh milk became accepted as a necessary food-stuff, and demand for it increased. However, the evolution of consumption was not the same in all regions of Europe due to their different environmental and agronomic conditions.

KEY WORDS: Milk consumption, standards of living, food history, medicine and food.

PALABRAS CLAVE: Consumo de leche, niveles de vida, historia de la alimentación, medicina y alimentación.

1. Introduction (*)

The spread of milk consumption between the middle of the nineteenth century and Second World War was a significant change in the diet of

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Europeans. That change was part of a more complex process often characterized as nutritional transition, just as the demographic changes that occurred at the same period of time in those societies are characterized. That very process advanced from the end of the eighteenth century, with the industrialisation and the urbanisation of society, and it was characterized by an increasing presence of animal origin foodstuffs within the diet of European people¹. That process, however, did not have the same evolution in the different regions of the continent. Therefore, while in Atlantic Europe the consumption of fresh milk was habitual at the end of the nineteenth century and continued growing later to very high levels, the evolution of the same product in Mediterranean Europe was different. In this zone, the consumption of fresh milk was still very limited in the 1890s, and it increased later very intensively, but without reaching, in most of the cases, the consumption levels of Atlantic Europe.

In this article we will give new evidence of the main circumstances which conditioned those processes by analysing the case of Catalonia. This region is of interest because, first, in that period it was developing into a major economic centre in Mediterranean Europe; secondly, it was particularly dynamic in generating and assimilating new scientific and technological knowledge; and thirdly, its inland weather conditions are very diverse and in some regions they are similar to those of Atlantic Europe. In Appendix 1 we show two maps representing the main territorial references that we shall mention.

2. The consumption of fresh milk between 1870 and 1936

A great deal of evidence remains with regard to the expansion of milk consumption in Europe since the 1870s, yet there are few quantitative estimates until the twentieth century. In the middle of the nineteenth century, the consumption of fresh milk was high in those regions that specialised in cattle rearing for meat, cheese and butter production, and also in some big cities that were close to these regions or which could import fodder from outside to supply urban herds. Consequently, the

1. Smil, Vaclav. *Feeding the world. A challenge for the twenty-first century*. Cambridge: The MIT Press; 2000.

estimates of fresh milk consumption in the nineteenth century are few, and often limited to the consumption of this product in cities. Nonetheless, the estimates made show that the consumption of fresh milk was already high in many areas of Central and Northern Europe by the end of the nineteenth century, and that during the first third of the twentieth century it continued to rise intensely. In that part of the continent, the consumption of fresh milk was already high in 1900, when it was around 70 and 100 litres per inhabitant per year, and went on increasing in the following three decades, even going over 200 litres in many towns and regions. Around 1930, the consumption per inhabitant per year was about 90 litres in Great Britain and 70 litres in France, between 120 and 180 litres in Norway, Denmark and Saxony, and over 200 litres on average in Switzerland, Sweden and Denmark. At the city level, fresh milk consumption was between 100 and 150 litres in London, Berlin, Strasbourg and Amsterdam; between 150 and 200 litres in Vienna, Hamburg and Oslo, and went over that number in Lucerne, Berne, Stockholm and Copenhagen. There were also some cases where the consumption reached 300 litres per inhabitant per year². In contrast, fresh milk consumption in

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2. Rew, H. R. An inquiry into the statistics of the production and consumption of milk and milk products in Great Britain. *Journal of the Royal Statistical Society*. 1892; 55 (2): 244-286 (251, 266, 272); Rew, H. R. Observations on the production and consumption of meat and dairy products. *Journal of Royal Statistical Society*. 1904; 67 (3): 413-427 (419, 421-426); Bulharowski, G. De l'approvisionnement en lait des villes en France. Paris: Société Alfa-Laval; 1929, p. 7; Llovet, J. La producció de llet i vaques lleteres a l'Empordà. Barcelona: Caixa de Pensions per a la Vellesa i d'Estalvis; 1934, p. 15; Carrasco, E. Lo que se come en España. *Archivos de Medicina, Cirugía y Especialidades*. 1934; XV (675): 669-675 (673); Mas Alemany, Josep. Els Serveis del Cos de Veterinària a l'any 1934. Barcelona; 1935, p. 27; Atkins, P.J. A tale of two cities: a comparison of food systems in London and Paris in the 1850s. Ninth symposium of the international commission for research into European food history, Berlin, 21st to 24th September; 2005, p. 26; Orland, B. Milky ways. Dairy, landscape and nation building until 1930. In: Sarasúa, Carmen; Scholliers, P. & Van Molle, L., eds. Land, shops and kitchens. Agriculture and technology in historical perspective [CORN Publication Series, nº 6]. Turnhout: Brepols; 2005, p. 212-254 (222); Kajærnes, U. Milk: nutritional science and agricultural development in Norway, 1890-1990. In: Hartog, A. P. den, ed. Food technology, science and marketing: European diet in the twentieth century. East Linton/Scotland: Tuckwell Press; 1995, p. 103-115 (104) and Shärer, M.R. Analysis of nutritional status, the food industry and product innovation in the late nineteenth century, with reference to prefabricated pulse powder. In: Hartog, A. P. den, ed. Food technology, science and marketing: European diet in the twentieth century. East Linton/Scotland: Tuckwell Press; 1995, p. 19-35 (21).

Mediterranean Europe was still very low in 1900, and its later expansion was only noticeable in few cases, as Milan, Madrid, Barcelona or Girona³.

The reduced consumption of fresh milk in Catalonia until the early years of the twentieth century is also reflected in medical topographies (*topografías médico-sanitarias*) carried out by doctors from the different municipalities. Of the 45 topographies carried out between 1798 and 1907, their authors failed to mention milk consumption in 15 municipalities, and only attempted to quantify it in seven. The doctors also indicated that milk consumption covered the needs of the population, although in most cases the consumption of goat's milk was predominant, and the quantities consumed did not reach 20 litres per inhabitant per annum. The consumption of fresh milk was not only reduced in the municipalities of the centre and south of Catalonia, where the cultivating of cereals, grape vines, olives and fruit trees predominated (e.g., Tortosa, Reus, Calaf, Pons, Solsona, Tarrassa, Vilassar, Martorelles and Castellar del Vallès). Consumption was also very low in the more northern municipalities, where the presence of cattle was much greater (e.g., Vic, Olot, Camprodon and Figueres), and in the region's capital. In the city of Barcelona, consumption failed to reach 5 litres in 1850 and was 13 litres in 1902⁴.

Various reports concerning Spanish livestock in 1891 confirm the above observations. These reports only mentioned the presence of dairy herds in the city of Barcelona and in just a few other localities. They also indicated that in cattle rearing areas the calves were weaned at three or four months after birth, and from that moment on the cows were

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3. For the case of Barcelona, Ràfols i Casamada, J. L'evolució del consum de llet a Barcelona, segles XIX i XX. Causes, factors i circumstàncies connexes. In: Blanes, G. and Garrigós, L., coords. Actes de la IV Trobada d'Història de la Ciència i de la Tècnica. Barcelona: SCHCT; 1998, p. 423-428; Ràfols i Casamada, J. El abastecimiento de leche a Barcelona: de las vaquerías urbanas a las grandes superficies comerciales. In: Capel, H. and Lintenau, P.A., coords. Barcelona-Montreal. Desarrollo urbano comparado. Barcelona: Publicacions de la Universitat de Barcelona; 1998, p. 285-298; Ràfols i Casamada, J. Criteris de qualitat de la llet consumida a Barcelona, segles XIX i XX. In: Batlló, J.; De la Fuente, P. y Puig, R., coords. Actes de les V Trobades d'Història de la Ciència i de la Tècnica. Barcelona: SCHCT; 2000, p. 463-467; Ràfols i Casamada, J. La llet al segle XIX: de medicina a aliment. In: Batlló, J., Bernat, P. y Puig, R., coords. Actes de la VI Trobada d'Història de la Ciència i de la Tècnica. Barcelona: SCHCT; 2002, p. 97-106, are of a particular interest.
 4. These topographies are in the Archivo de la Real Academia de Medicina y Cirugía de Barcelona (ARAMCB). See, also, Vila, Pau. Opinions d'un geògraf i actituds d'un ciutadà. Selecció d'escrits de Geografia de Pau Vila. Barcelona: Curial; 1979, p. 12.

not normally milked. Their authors also indicated that goats produced daily between one and three litres of milk over ten months, but added that the kids were suckled for a long time because meat production was more profitable⁵.

During the first third of the twentieth century, the consumption of fresh milk increased at a great rate, however it did not reach the high levels seen in Atlantic Europe, and only ended up being relevant in the city of Barcelona and in the province of Girona. In Barcelona, fresh milk consumption increased above all between 1900 and 1918, and in the province of Girona it mainly increased in the 1920s and 1930s. In these cases, consumption ended up being between 70 and 80 litres. In the province of Tarragona, the expansion of consumption was also very intense, though by 1933 it had yet to reach an average of 35 litres. In the province of Lleida and in most of the province of Barcelona, levels of consumption were even lower in the 1930s, and did not exceed 25 litres. In Tarragona, moreover, goat milk consumption was always very important.

The expansion of milk consumption in the city of Barcelona and in the province of Girona has left other evidence⁶. Until the middle of the nineteenth century Barcelona was mainly supplied with goats and cows entering the city on a daily basis, to be milked in the street and returned to their original farms at night. By around 1900 this trade disappeared, and the city was supplied above all with milk coming from the 1,404 cows in 180 urban dairy herds, which produced 5.5 million litres of milk annually. Between 1.5 and 2 million litres of milk coming from neighbouring districts were also marketed in another type of establishment without stabled cattle: creameries. In 1918, the number of dairy herds in Barcelona had increased to 650, the number of stabled cows had risen to 7,500, and annual milk production within the city had increased to 25 million litres. At the same time, the milk coming from outside the city had also increased, coming eventually to 15

5. Dirección General de Agricultura, Industria y Comercio. La ganadería en España, Avance de la riqueza pecuaria en 1891, formada por la Junta Consultiva Agronómica, conforme a las memorias reglamentarias que en el citado año han redactado los Ingenieros del Servicio Agronómico. 5 vols. Madrid; 1892; vol. 1, p. 295-296, 304-305, 307, 318-323, 384, 396-397; vol. 2, p. 408, 412-413, 414.

6. Pujol, Josep. Especialización ganadera, industrias agroalimentarias y costes de transacción: Cataluña, 1880-1936. *Historia Agraria*. 2002; 27: 191-219 (208-213).

million litres⁷. This milk marketing structure changed radically in the 1920s and 1930s. Urban milk production rose very little from 1918 onwards and by 1933 it reached 30 million litres. In contrast, the number of creameries increased to 1,751 and the milk marketed by these establishments rose to 50 million litres⁸. At this time there were 911 dairy cattle farms counted, supplying mainly Barcelona—in the districts of Barcelonès, Vallès, Baix Llobregat and Osona—and it is estimated that 78% of their production was marketed by 15 companies⁹. The most important of these companies were *Letona S.A.* and *Soldevila S.A.*, with combined annual sales of 14.7 million litres. These companies were followed by another four ones, with sales of 13.5 million, and at a greater distance, the nine remaining ones, with sales of 9.6 million litres¹⁰. These companies were created initially in order to first, control the purchase and sale price of the milk marketed in line with the increase in demand; secondly, use the new technique of pasteurisation to lengthen the life of the product; and thirdly, to promote new milk product preparations to compensate the reduction in fresh milk consumption during the summer months¹¹. In the 1930s, however, the consumption of sterilised and bottled milk, condensed milk and milk drinks was still very low in absolute terms. Bottled milk was known as «machine milk» and was not widely accepted among the population¹².

7. Anuario estadístico de la Ciudad de Barcelona (AECB), 1902, p. 526; Asociación General de Ganaderos. Estadística de la producción de leche, manteca y queso. Madrid; c. 1923, p. 82-83, 90-91, 94-95, 106-107; Junta Consultiva Agronómica. Estudio de la ganadería en España. Resumen hecho por la Junta Consultiva Agronómica de las memorias de 1917 remitidas por los ingenieros del Servicio Agronómico provincial. Madrid; 1920, p. 185; and Llovet, J. Els preus de la llet a Catalunya durant els anys 1936 i 1937. Arxiu de l'Escola Superior d'Agricultura. Barcelona. 1938: 155-181 (158-159).

8. Mas Alemany, Josep. Memoria corresponent a la labor dels Serveis de Sanitat Veterinaria. Barcelona: Ajuntament de Barcelona; 1933, p. 20, and Mas Alemany, n. 2, p. 25, 28.

9. Estadística administrativa de la contribución industrial, de comercio y profesiones de 1930, p. 104; Llovet, n. 7, p. 158-159, estimated that from El Vallès some 100,000 litres of milk were sent daily to Barcelona. Reparaz, G. de. La Plana de Vic. Barcelona: Editorial Barcino; 1928, p. 245-246, estimated that the deliveries from Osona were between 8,000 and 9,000 litres daily.

10. Generalitat de Catalunya. Informe sobre el proveïment de llet a Barcelona. 1937; Arxiu Nacional de Catalunya: Fons Generalitat de Catalunya 2ª República, 7589, p. 79. Beside *Letona* and *Soldevila*, the following companies also have to be mentioned: *Lechera Barcelonesa S.A.*, *Sila S.A.* (before known as *La Industrial Lechera S.A.*) and *Productos Marinette S.A.*

11. Pujol, n. 6, p. 208-213.

12. Pujol, n. 6, p. 208-213.

In Girona the expansion of consumption was late in coming. In the municipality of Olot, the rearing of dairy cows did not begin to acquire importance until 1917, and it was not until the 1920s that the number of dairy farms increased significantly. As a result of this process, by the end of this decade the city council increased the analysis of the milk marketed in its area, both in sales establishments in the municipality and in the farms that supplied them¹³. In Figueres, the city council did not keep account of fresh milk consumption in the municipality until before the First World War, and in the 1930s it was estimated that the consumption was between 75 and 80 litres per inhabitant per annum¹⁴. In 1928, the doctor who drew up the medical topography of Camprodon affirmed that «Over the years that I have been working, I have seen the beginning of the use of milk as a common food among the people in this country, both in towns and in villages, with the use of cow milk being the most widespread kind»¹⁵. At the same time, the consumption of milk became so high in Girona that on July 5th 1934 the city council approved the «Health Policy Regulations for the supply of hygienic milk» and the creation of a Milk Centre for the reception and hygienisation of this product¹⁶. In the case of the province as a whole, various agronomists indicated that the production of fresh cow milk did not begin to acquire importance until the 1920s, and that its commercialisation was only important on a province scale¹⁷.

In short, we can conclude that there was an overall and very sharp rise in the consumption of fresh milk from the end of the nineteenth century, and that in Catalonia, and in all probability in Mediterranean Europe as a whole, the expansion of consumption occurred much later and did not reach the high levels of Atlantic Europe. We can also conclude that the expansion of the consumption of fresh milk in Catalonia was initially very localised in the city of Barcelona, and that at a later date it spread out, especially to the province of Girona. What circumstances allow the explanation of these processes?

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13. Junta Consultiva Agronómica, n. 7, p. 267; Pujolar, R. Como se ha evitado la adulteración de la leche en la ciudad de Olot. Olot: 1929, p. 7-18.
 14. Fons Municipal de Figueres: 840, 1837 and 1583. Arxiu Comarcal de l'Alt Empordà.
 15. Sau, J. Topografía médica de la comarca de Camprodon. San Feliu de Guixols: 1928, p. 49-50.
 16. Ayuntamiento de Girona. El Proveïment de llets a Girona: l'Alcalde de Girona a l'opinió pública. 1934-1935; Biblioteca de Catalunya, Fons Ferran de Sagarra C. 15, carpeta 3, 39.
 17. Llovet, J. La producció de llet i vaques lleteres a l'Empordà. Barcelona: Caixa de Pensions per a la Vellesa i d'Estalvis; 1934, p. 11-15.

3. The traditional uses of fresh milk

The increasing consumption of animal origin proteins from the second half of the nineteenth century has often been associated with the growth of people's income. In this sense, it is considered that the demand for foods of animal origin has a high flexibility with regard to income, and that when this last variable increased as a result of economic growth, the presence of those foods in the population's diet also increased. Nevertheless, income levels and the way they evolved can hardly explain the appreciable differences seen in the consumption of fresh milk in Atlantic and Mediterranean Europe at the end of the nineteenth century, and, in the case of Catalonia, the intense expansion in the consumption of that product that took place in the city of Barcelona and in the province of Girona, between 1900 and the 1930s. In the city of Barcelona, meat and fish consumption went from 64 to 67 Kg per inhabitant per year between 1900 and 1933, the consumption of eggs increased from close to 100 to almost 180 units, and the consumption of fresh milk, as we have seen, from 13 to almost 80 litres¹⁸. With regard to Girona, we can also conclude that the expansion of milk consumption was much more intense than that of other foods. Between 1923 and 1933, the consumption of fresh milk in this province probably increased around 200%, and this percentage would be higher if we took as a reference the reduced levels of consumption at the end of the 19th century. If the highest income levels that favoured the economic growth in Catalonia in that period were oriented, in part, to raise the consumption of animal proteins, why did the milk consumption particularly increase?

In order to explain the evolution in the consumption of fresh milk, let us first of all remember that milk contains a great quantity of water, and that its calorie and protein contributions per unit of weight or volume are therefore very low. In contrast, milk provides a substantial amount of calcium and vitamins, and contains proteins of a very high biological value, yet these nutritious advantages of milk did not start to be valued until the end of the nineteenth century. We should also bear in mind that the numerous micro-organisms that contaminate and alter milk did not begin to be discovered until after Pasteur's studies in the 1860s, and that their

18. Nicolau, Roser; Pujol, Josep. El consumo de proteínas animales en Barcelona entre las décadas de 1830 y 1930: evolución y factores condicionantes. *Investigaciones de Historia Económica*. 2004; 3: 101-134.

elimination, by pasteurising and sterilising the product, did not become widespread until well into the twentieth century¹⁹.

Until the end of the nineteenth century, in short, fresh milk was not considered an important foodstuff in the population's diet, and its consumption could even be dangerous²⁰. Specialists and the population in general valued above all foods with a high density of glucides, lipids and total proteins; and using these criteria milk compared very badly with cereals, tubers, pulse, vegetable fats and the other foods of an animal origin. At the same time, milk was a product that needed to be consumed very soon after milking, and this circumstance greatly reduced its uses and the number of users.

In spite of these inconveniences, the consumption of fresh milk was recommended in situations of weakness due to disease or old age. In these circumstances doctors recommended light or liquid diets, and at that time not many alternatives to milk existed. This product could also be consumed as a complement to other foods; for instance, mixed with cereals and tubers to increase the energy density of these products and to make them more pleasant to eat, or to accompany the consumption of stimulants such as tea, coffee and cocoa. Nonetheless, in early childhood, doctors only recommended consuming cow milk or goat milk in very limited cases. For instance, when the baby was suffering from syphilis or other infectious diseases, or when it was not possible to use the mother's milk or that of other women.

In this context however, three circumstances favoured its consumption in Atlantic Europe in the nineteenth century. In that part of Europe, first, environmental conditions greatly favoured cattle farming for the production of foods with a high concentration of animal fats and proteins; secondly, the climatic conditions delayed the contamination of the product more than in Mediterranean Europe; and thirdly, transport infrastructures were more developed. In Atlantic Europe, in short, the supply of fresh milk was plentiful; the environmental conditions made it easier to preserve the product, and it could be transferred to the main centres of consumption relatively quickly. In that part of Europe, it is therefore understandable that

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19. Mas Alemany, Josep. Mamitis de les vaques lleteres, des del punt de vista de la sanitat pública. *Anales de la Real Academia de Medicina de Barcelona*. 1930; 12: 168-171.
 20. Atkins, P. J. White poison: the health consequences of milk consumption, 1850-1930. *Social History of Medicine*. 1992; 5: 207-227; Murcott, A. Scarcity in abundance: food and non-food. *Social Research*. 1999; 66 (1): 305-339.

milk prices were relatively lower and that levels of income determined the levels of milk consumption much more than in Mediterranean Europe²¹. According to some 1902 statistics, 1 litre of milk in Barcelona cost the same as 0,84 kg of bread, 5 kg of meat and 2,5 kg of sugar. In Vienna, on the contrary, the proportions were 1:2, 1:7.2 and 1:3.6, and in Brussels, 1:1.25, 1:2.5 and 1:4.1. The lowest relative price of fresh milk was also to be found in Paris, Munich, Berlin and Hamburg²².

In Catalonia, the environmental conditions favoured an intense expansion of areas for the growing of cereals, vineyards, olive groves and fruit trees from the eighteenth century onwards, and this circumstance greatly limited the role of cattle farming for food production. This cattle farming was thus concentrated in the most northern districts, which were those with the worst communication networks with the main population centres, and focused mostly on the production of work animals²³. For this reason, as in many other regions of Mediterranean Europe, the consumption of beef, cheese, butter and fresh cow milk was very restricted in Catalonia until the end of the nineteenth century, and the population's protein, carbohydrates and fat requirements were met mainly by consuming mutton, cereals, legumes and olive oil²⁴. In this context, goat milk partly compensated for the scarcity in the production of cow milk, but the production capacity of milk of these animals was very limited. In addition, unlike Atlantic Europe, the transport infrastructure in Catalonia made the marketing of fresh milk much more difficult, and the milk deteriorated very quickly in the climatic conditions found in the region.

Nevertheless, although the consumption of fresh milk could be dangerous for health, there were few substitutes when very light diets were called for. Consumption was high in hospitals for this reason²⁵, and doctors recom-

21. See for Great Britain, Rew, n. 2, 1892, p. 421, and Rew, n. 2, 1904, p. 391.

22. AECB, n. 7, p. 530.

23. Junta General de Estadística. Censo de la ganadería de España. Madrid; 1868: p. 25-29, 67-69, 91-95, 147-149.

24. Cussó, Xavier; Garrabou, Ramón. La transició nutricional a Catalunya: una primera aproximació. *Recerques*. 2003-2004; 47-48: 51-80 (51-72) and Nicolau, Pujol, n. 18, p. 103-111.

25. The consumption of ass and goat's milk was common in Vic hospital (Arxiu Comarcal d'Osona, Fons Hospital de la Santa Creu, doc. 726, 862); and that of cow's milk and goat's milk in those of Olot and Figueras (Arxiu Comarcal de la Garrotxa, Fons Hospital d'Olot, doc. 19-31, 33, 165, 166, 169-173, 224, 230); Arxiu Comarcal de l'Alt Empordà, Fons Hospital de Pobres de Figueras, doc. 154, 158).

mended it in situations of disease or old age²⁶. A leading geographer thus stressed that in Catalonia nobody drank milk except under doctor's order, and referred to «that ancient idea of feeding with milk which considered milk as belonging solely and exclusively to the realm of doctors and healing». Milk, he concluded, «was, so to speak, a dreadful thing. Nobody drank it, and people's concern was so strong on this point, that it was believed that those taking it were sick»²⁷.

In Catalonia, in short, the supply of milk was very low and its consumption was restricted to groups of people for whom there were very few substitutes. It is hardly surprising therefore that its price was relatively high, and that its consumption had very little to do with income levels, except in the case of sick people. In the 1880s, the average wage of a male adult in the city of Barcelona was 2.5 to 4.5 pesetas, and the price of a litre of milk was 0.4 to 0.5 pesetas. Higher income groups could therefore acquire milk when they needed it, but the majority of the population could only have access to it when they were admitted to hospital, by means of public or private charity, or because they had one or more goats. Nonetheless, milk consumption was very low in normal health conditions, and had very little to do with levels of income.

4. Milk for everybody

In some occasions, it has been suggested that in the late nineteenth century, fresh milk was more like some kind of medicine than proper foodstuff, because that product occupied a strategic place in the diet of ill and elderly people²⁸. Although in the nineteenth century milk was more valued for its therapeutic properties than for its nutritious properties, however we

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26. Casellas, P. *Ensayo Topográfico-Filosófico-Médico o sea, Reseña circunstanciada de la sociedad y de los habitantes de la M. Ilustre Villa de Olot*. Barcelona: s.n.; 1849, p. 59; Camps, F. X. *Topografía médica de la Villa de San Ginés de Vilasar y de Cabriils*; 1889, p. 37. In: ARAMCB (Fondo Topografías); Aymerich, P. *Tarrassa. Su topografía médica*; 1881, p. 38. Written copy in ARAMCB (Fondo Topografías); Anonimous. *Topografía médica de Martorellas*. In: ARAMCB (Fondo Topografías) p. 81-99; and Salarich, J. *Higiene de la primera infancia*, 1877. p. 17. Written copy in Archivo Episcopal de Vic.
 27. Vila, Pau. *El Vallès. Assaig geogràfic*. In: *Comarca del Vallès*. Barcelona; 1930, p. 1-83 (12-13, 62-65), and Vila, note 4, p. 119-128.
 28. Murcott, n. 28; and Ràfols i Casamada, n. 3.

do not believe that this very product was seen as medicine by people. We think that milk was foodstuff, although something dangerous for health, and for that reason, its consumption was high when the agricultural and environmental conditions allowed it, as it happened in central and northern Europe. Moreover, if the consumption of fresh milk was higher in situations of illnesses and old age, it was because fresh milk had very few substitutes in those situations. In those circumstances, milk, soups and broths used to be the basis of food.

In any case, and however strong or weak was the perception people had of milk as medicine, the social value of that very product had to change in a very intense way during the first third of the twentieth century, more specially in Mediterranean Europe. In the city of Barcelona and in the province of Girona, as we have seen, the consumption of fresh milk greatly increased in that period, and in the 1930s, milk was seen as staple good.

Which circumstances favoured that change of people's food habits? Regarding the Atlantic side of Europe, we can think that the high levels of milk consumption in the nineteenth century favoured its subsequent expansion a lot, when the advances in microbiology and nutrition allowed to know better the nutritious advantages of milk and to improve its hygiene. In Mediterranean Europe, on the other hand, the starting point was very different, and the intense expansion of consumption of this product, in the first third of the twentieth century, had to go along with an important change in the diet culture of the population. Which circumstances provoked that change and how did it develop? In other words, which circumstances favoured the fact that in Mediterranean Europe fresh milk was seen as essential foodstuff in the 1930s when in the late nineteenth century it was valued, nearly exclusively, as a nutritious resource for old and ill people?

The studies carried out about the consumption of fresh milk in Europe and in the USA, point out the impact the spreading of new knowledge in microbiology and nutrition had in its evolution, one knowledge that took place after Pasteur's discoveries²⁹. With the discovery of the microorganisms that contaminated milk and of the methods to eliminate them or delay their action, milk consumption became more secure, and

29. Atkins, n. 20, p. 207-227; Melani, E. *Nature's perfect food: how milk became Americans' drink*. New York/London: New York University Press; 2002; Orland, n. 2, p. 212-254.

that circumstance allowed the fact that it could be extended to new-born babies and children, that accounted for a large group. Once the hygiene of the product was bettered, new investigations centred the attention on the nutritious advantages of milk, and their results made it possible for milk to be seen as essential foodstuff.

At the same time to all this, a wide set of social initiatives, very often linked together, diffused the new knowledge concerning nutrition among the people, and provoked a sustainable increase in milk demand. First, there were the activities that medical doctors and pharmacists developed, in their surgeries or in collaboration with the milk industry, and as people in charge of the Public Health Service, in hospitals and breast-feeding places, or assuming inspection and control of milk hygiene activities. Second, those studies also highlight the numerous public initiatives that got developed at the same time in both sides of the Atlantic Ocean, to improve the hygiene of the product and to encourage milk consumption among the children and the new-born babies. A third set of initiatives was developed by the new dairy companies that appeared at that time, with the purpose to widen and diversify their markets. All those factors are present in our case of study.

The activities of doctors in Catalonia are reflected in first, the recommendations that they included in numerous publications on paediatrics, child care and nutrition³⁰; secondly, the diets prescribed in hospitals³¹; thirdly, their active participation in the setting up of *goutes du lait*³²; and fourthly, the activities they organised in various primary schools such as the municipal «El Bosque» school in Barcelona³³. Other pieces of evidence concerning the role medical doctors and pharmacists had in the spreading of milk consumption are more explicit. The doctor that drew up the topo-

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30. In the journal *Revista de Medicina y Cirugía Prácticas* (later *Archivos de Medicina, Cirugía y Especialidades*) alone, over 350 articles were published about milk between 1881 and 1936.
 31. The consumption of milk in the Hospital Clínico of Barcelona was 250 litres per stay and year in 1909 (*AECEB*, 1906-1923) and in that of *Sant Jaume* of Olot it was 11 litres in 1885, 127 litres in 1921 and 248 litres in 1936. *Arxiu Comarcal de la Garrotxa, Fons Hospital d'Olot, «Administración General», c-19 a 31 and 230; and «Apuntes de lo que entra y se gasta en comestibles en el Santo Hospital de Olot», c-224.*
 32. Fernández Horques, M. Las gotas de leche como instituciones complementarias necesarias para el éxito en la lucha contra la mortalidad infantil. *Archivos de Medicina, Cirugía y Especialidades*. 1934; 37: 534-539.
 33. Cussó, Xavier; Garrabou, Ramón. L'Escola de Bosc. Un referent pioner a la transició nutricional moderna a Catalunya. *Estudis d'Història Agrària*. 2004; 17: 497-512 (502-509).

graphy of Calaf observed in 1903, that «for some years, and mainly due to the advice given by the worthy doctors of the population, the consumption of milk has been going up, with very few inhabitants of Calaf not drinking it from time to time»³⁴. In 1923 the director of the technical services for agriculture in Catalonia also highlighted the influence of medical advice on the increased consumption of eggs and milk³⁵. We also have at our disposal very eloquent testimonies concerning the participation of those groups in the promotion of different types of dairy products, and concerning the new professional relationships they established with the dairy industry.

The close relationship between pharmacists, medical doctors and businessmen of the dairy industry has left several kinds of evidence. In the case of Catalonia's two most important milk factories, *Soldevila S.A.* and *Letona S.A.*, the activity of pharmacists and medical doctors was particularly relevant. In 1926, the pharmacist graduate José Morera registered as the manager of the Soldevila Laboratory, two new products as food for children in the General Board of Health; they were elaborated with pasteurised and homogenised milk, and comercialised as *Lacta* and *Nutricia*. Nearly at the same time, Santiago Alfés, pharmacist and technical manager of *Letona S.A.*, registered in the same Board a preparation made up of condensed milk, and a few years later, between 1933 and 1934, three new elaborations of the same products. In 1936, the same pharmacist registered for the same company *La Sirena*, another preparation made up of condensed milk, and for *Productos Marinette S.A.*, different types of maternized feeding bottles. Between 1934 and 1935, Letona also closely collaborated with doctor Diego Ferrer, and out of that collaboration two new products of food for children were registered: *Vitamlac* and *Hepatilac*.

But these were not the only cases of collaboration between biomedical specialists and the businessmen of the dairy sector. In the 1920s, Martínez Vargas, professor in children's illnesses at the Barcelona Faculty of Medicine, collaborated with the *Sociedad Lechera Montañesa* to encourage the consumption of the condensed milk *El Niño*, with different publications the purpose of which was to advise mothers how to feed their children better. At the same time, Agustín Farriols and S. García Quintana, medical doctors at the *Casa de Lactancia*, and F. Macià, medical doctor at the Santa

34. Llorens, I. de. Topografía Médica de Calaf. Barcelona; 1904, p. 81.

35. Raventós, J. L'alimentació humana. Barcelona: Mancomunitat de Catalunya; 1923, p. 30-31.

Creu Hospital, made up similar activities for *Industrial Lechera S.A.*³⁶. Another piece of evidence of a close relationship between medical doctors and businessmen of the dairy industry is shown in this last company. In a 1914 leaflet, that company promoted the condensed milk *Montseny*, elaborated near Barcelona, by publishing the names of 99 medical doctors who supported its quality and hygiene³⁷.

On the other hand, from the end of the nineteenth century onwards this sort of messages was very common in the advertisements of dairy products that a number of dairy companies published in different kinds of journals. We can find advertisements of these products from 1880 onwards, although they were not usually found until after the First World War. At the beginning of the twentieth century, the advertisers were mainly dairies and creameries which wanted their establishments to become more popular, and big agricultural farms which provided the city of Barcelona with fresh milk³⁸. With the new century going on, on the contrary, the most regular advertisers were commercial and/or industrial companies, which promoted different kinds of dairy products and which preferred to choose newspapers and magazines of a wide circulation for that purpose³⁹. Among the dairies, creameries and rural exploitations, we could point out companies such as *Granja Viader* and *Granja La Ricarda*.⁴⁰ And among the industrial

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36. Archivo General de la Administración. Fondo Ministerio de la Gobernación. Dirección General de Sanidad. Inspección General de Farmacia. Sección de Registros Farmacéuticos-Especialidades. Sustitutivos de la Lactancia (1926-1936): Cajas 08.44/17.472, 08.44/17.473 y 08.44/17.474; ¿Qué es el Vitamlact? y ¿Qué es el Hepatilac? Arxiu Jordi Viader Riera, Fons Joan Viader Roger: 0405 y 0411; and Archivo Histórico de la Oficina Española de Patentes y Marcas: M. 98.245 i M. 103.154.
 37. Granja-Torre de Sagarra. San Pedro de Vilamajor. Barcelona, undated.
 38. Those would be the cases, for instance, of *Vaquería i Lleteria Esteve Font i Riera* (Lo Nunci, 1880), *Torre Baró* (Album Salón, 1898), *Granja Colomer* (La Vanguardia, 1911), *Granja La Ricarda* (Select Guide, 1913; Maravillas de España. Barcelona; 1914; Barcelona Atracción, 1915), *Granges Ausona* (Catálogo Oficial de la VI Feria de Muestras, 1933), *Granja Viader* (L'Abella d'Or, 1931), and *Granja la Catalana* (Butlletí del Gremi de Lleteries, 1933, 1936).
 39. In those cases, the chosen publications were, together with La Vanguardia, Hogar y Moda, Lecturas or ABC, but also many other periodical publications directed to more reduced groups, such as for example D'Ací i d'Allà, Bella-Terra, El Nuevo Mundo or Menage. The products that were promoted were: condensed milk (*El Oso, El Pagès, La Lechera, Victoria, La Vaquera, o El Niño*), dairy-based drinks (*Cacaolat*), yoghurts (*Danone*) and other preparations (*Marinette*).
 40. *Granja Viader* was a dairy factory set up in 1904, whose owner, Marc Viader, later opened other dairy factories under the same name and founded in 1925, *Letona S.A.* *Granja La Ricarda* was a rural exploitation with more than 100 cows, founded in Sant Feliu de Llobregat in the 1890s by J. Casanovas.

companies, we could highlight *Letona S.A.*, *Soldevila S.A.* and *Productos Marinette S.A.*⁴¹.

The governing municipal institutions also had an important role in the spreading of fresh milk consumption. These institutions not only collaborated with doctors in setting up *Goutes du Lait* and financing the consumption of milk in schools. They also adapted the municipal regulations to take into account the new scientific knowledge on hygiene for the product, and increased the quality controls on the milk being marketed. To this end, the Barcelona City Council insisted on stricter hygiene conditions for urban cow herds, and enforced their transfer to neighbourhoods with less dense populations; specified the characteristics of containers in which milk was transported to the city; reinforced the administrative services entrusted with pursuing its adulteration; and, as early as the 1930s, promoted two new facilities for centralising and analysing the milk entering the city⁴². The city councils of Olot, Figueres and Girona promoted similar initiatives after the First World War.

The spreading of the pasteurization and sterilization processes came later. Until the First World War, those methods to make milk more hygienic were mainly used in the breast-feeding places (*goutes de lait or casas de lactancia*) and in some hospitals. In the 1920s and 1930s, their use increased, but only in the big companies that provided the city of Barcelona, and in the making of condensed milk and of the dairy products for child food as a whole. In short, in the 1930s, the proportion of pasteurized milk was relevant in the city of Barcelona, but it still accounted for a very low percentage of milk commercialised by the urban dairy herds of the city.

From the previous exposition, we can point out two conclusions. The first one is that at least until the First World War, the improvements in milk hygiene were mainly connected to the measures of public health the town

41. In the 1930s, *Letona* launched a new dairy drink, *Cacaolat*, which became very usual in advertising. *Granja Soldevila* was set up as a family-run business around 1892 and became a Limited Liability Company in 1928. *Granja Marinette* was set up in 1929 as a family-run company, but very quickly, in 1935, it also became a Limited Liability Company.

42. Mas Alemany, n. 2, p. 30-33, and Institut Municipal de la Salut. Cent anys de Salut Pública a Barcelona. Barcelona: Ajuntament de Barcelona; 1991, p. 31-74, 75-104, 171-192. As indicated by Barcelona City Council, in 1902 73 of the 132 milk samples analysed by the Municipal Chemical Laboratory were adulterated (55%). In 1934 the number of analyses was 13,391, and adulterated samples 1,886 (14%), AECB; 1902, p. 531; AECB; 1903, p. 408; Mas Alemany, n. 2, p. 31 and Roca i Rosell, A. Història del Laboratori Municipal de Barcelona de Ferran a Turró. Barcelona: Ajuntament de Barcelona; 1988.

councils promoted, and also to the spreading of more hygienic practices regarding the care of the cows and the trading of milk, on the part of farmers, industrials and traders⁴³. The second one is that medical doctors, pharmacists, town councils and dairy factories acted as mechanisms of transmission of the scientific advances in the field of microbiology and nutrition, and that their different initiatives were decisive in the sustained increase of fresh milk demand.

We believe that the decisive step in that direction was taken when milk was consumed among children, because from then on, its consumption among the grown-ups turned out to be easier. It must also have encouraged the consumption of fresh milk in the population as a whole, the increasing consumption of coffee and cocoa, and the increase of families' incomes⁴⁴. Yet, if the improvements in the income levels were in part directed to increase the consumption of milk, it was finally due to the new consumption habits that enabled the scientific advances in microbiology and nutrition and to the numerous initiatives promoted to encourage the consumption of that very product.

5. Milk and environment

Nevertheless, the expansion in the demand for milk could only be partially satisfied. In order to increase the supply of milk in Catalonia, it was essential to change the varieties of cattle existing in the region, to increase the availability of cattle feed and fodder, and to improve transport infrastructures. When we consider how these obstacles were overcome, two questions can be better understood: the special importance that the city of Barcelona had in the transformation of the milk sector in the region, and the different courses that fresh milk consumption followed.

43. Still in the 1950s, people were used to buying milk in small quantities to consume it straight away after boiling it. It is not surprising that in the period we are studying the creameries became new socializing centres and that some of them ended up becoming consumption places, where the Barcelona inhabitants could taste a wide range of dairy products. Martí Escayol, M^a A. *El plaer de la xocolata. La història i la cultura de la xocolata a Catalunya*. Valls: Cossetània Edicions; 2004.

44. Between 1905 and 1920, Barcelona's imports of cocoa increased from 2.3 to 6.3 million kilograms and those of coffee from 3.7 to 12.7 million, AECB; 1905, p. 569 and AECB; 1920, p. 566-567.

The city of Barcelona was not only an important centre for disseminating the new preferences of consumers. In the 1880s, cattle breeders in the city started using Swiss and Dutch cows, and the calves obtained were weaned four or five days after birth, to be sold to rural farms that could feed them. Soon afterwards, in the districts of Vallès and Baix Llobregat, the agricultural and cattle farms expanded themselves with cows from these sources. Some of these farms were big businesses with over 100 cows, but in the great majority they were small and medium-sized farms, which acquired these animals by means of different types of contracts with the major traders in the sector. As a result of these activities, the importing of bulls and cows from Switzerland and Holland increased, and after a great deal of cross-breeding the milk productivity of the region's cattle was improved⁴⁵.

However, the aforementioned activities were only developed intensively in some areas. In particular, in those districts where the environmental conditions suited the farming of the new cattle, and which by different means —imports or new crop rotations— were able to increase their availability of feed and fodder. In El Segrià and La Noguera, in the south of the province of Lleida, the expansion of irrigated areas and the use of mineral and chemical fertilizers also increased the availability of fodder. However, in these districts the new irrigation systems were very inconsistent, and the temperatures in spring and summer were too high for the production and marketing of fresh milk on a large scale.

In addition, although the transport infrastructures improved, by the 1930s they were still very deficient for transporting milk over large distances. The railway system did not reach a great many production areas and was too slow, and the road network outside Barcelona was of a very low density. Moreover, the transportation of milk by lorry only began to acquire importance after the First World War, and refrigerated trucks were only used in very few cases⁴⁶. Lastly, during the 1920s and 1930s, the new milk preservation techniques spread among the big companies supplying the city of Barcelona, but very little in the rest of the region⁴⁷. Consequently, the

45. Pujol, n. 6, p. 196-197 and Pujol, Josep. Sobre los orígenes de la industrialización en el sector alimentario: Cataluña, 1880-1935. In: Barciela, C. and Di Vittorio, A. Las industrias agroalimentarias en Italia y España durante los siglos XIX y XX. Alicante: Universidad de Alicante; 2003, p. 245-278 (266-268).

46. Generalitat de Catalunya, n. 10, p. 12; Reparaz, n. 9, p. 279-280; and Mas Alemany, n. 2, p. 33.

47. Llovet, n. 7, p. 157.

farms in the irrigated areas of Lleida specialised in the production and exportation of fodder and feed to the province of Barcelona; numerous Girona farms moved over to specialising in the production and exportation of dairy cattle, to that same province; and the farms closer to the city of Barcelona specialised in the production of fresh milk to supply the capital.

At the same time, while the growth of milk production in the province of Barcelona tended to slow down after the First World War, as its production possibilities became exhausted, in the province of Girona it increased, though without the marketing of that product going beyond the province itself. Various reports on milk prices are in line with the aforementioned trends. In the city of Barcelona, milk prices in constant pesetas fell sharply between the end of the nineteenth century and 1920, increased greatly in the immediate post-war years, and stayed very high for the rest of the period. As a result, the fresh milk prices in Barcelona between 1931 and 1935 were very similar in constant pesetas to those which were current in the same city in the 1890s. At the same time, while the price of fresh milk in that city was 0.70 pesetas/litre around 1933, in the province of Girona it was 0.40 pesetas⁴⁸.

6. Conclusions

Nowadays fresh milk holds an important position in people's diet, but this situation has been the result of a long process, which only strengthened up in the early 20th century. This process went along with the expansion of the consumption of animal origin foodstuffs as a whole, and it has often been related to two variables: a) the changes that the relative prices of foodstuffs experienced from the agricultural crisis in the late 19th century and; b) the improvements that occurred in the real wages of the population at the same time. In that respect some researchers argument that fresh milk was some foodstuff with a high elasticity in the demand with regard to the real incomes of the consumers, and that when that variable improved, the demand quickly increased.

48. Appendix of Ministerio de Agricultura. Anuario Estadístico de las Producciones Agrícolas. Madrid; 1934, p. 96-103; and Llovet, n. 7, p. 176.

Our work shows that this explanation is incomplete because in the 1880s, the specialists and people in general still mostly valued the food content in calories and proteins, and this situation did not start to change until the arrival of the new century. In those conditions, fresh milk consumption was high in Central and Northern Europe because its offer was high and the environmental conditions favored its preservation; and more generally, among those groups of elderly and patients, who needed liquid diets. The consumption was also high among the underage, who, for a reason or another, could not be breast-fed. In Mediterranean Europe, fresh milk consumption was concentrated among those three groups, and although the prices of that foodstuff were high, this circumstance did not stimulate its production. All in all, still around the year 1900, the population did not value fresh milk as an important component of their diet, and for that reason, its consumption was only high in very special circumstances.

That situation started to change when the scientific progress permitted to know better the causes of the quick deterioration of fresh milk, a little time after being produced, and the contributions of the foodstuff in calcium and vitamins. As those processes went on, new business and institutional initiatives changed the preference structure of the population, and fresh milk consumption increased in a sustained and significant way. The collaboration between doctors, businessmen and politicians was in that respect fundamental and fresh milk consumption increased first among the underage and the youngsters and then among grown-ups. As a result of all those processes, in the 1930s, fresh milk was already seen as an essential foodstuff in the diet and its consumption was only reduced in the areas that were far away from the production centers.

Summarising, if we want to understand better the changes that the Europeans' diet suffered in the twentieth century, we do not have to consider only the evolution of the family incomes. We should also consider, first, the different effect that the environmental conditions had in a geographical scale; secondly, the scientific progresses that took place in microbiology and nutrition; thirdly, the several public and private initiatives that were developed at the same time with the aim of promoting more balanced diets; and fourthly, the spread of new technologies in the agricultural and industrial sectors. ■

Appendix 1

Source: Elaborated by the authors.

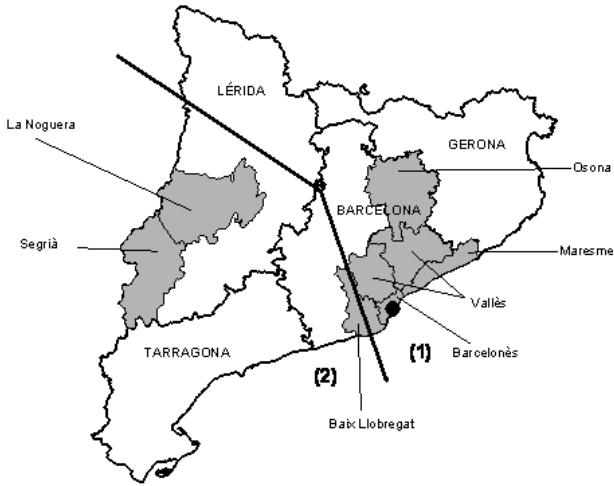


Figure 1: Map of the provinces and regions referred to in the text, and specifying of the main climatic areas of Catalonia.

(1) Area with high rainfall and moderate temperatures in spring and summer.

(2) Area with low rainfall and high temperatures in spring and summer.

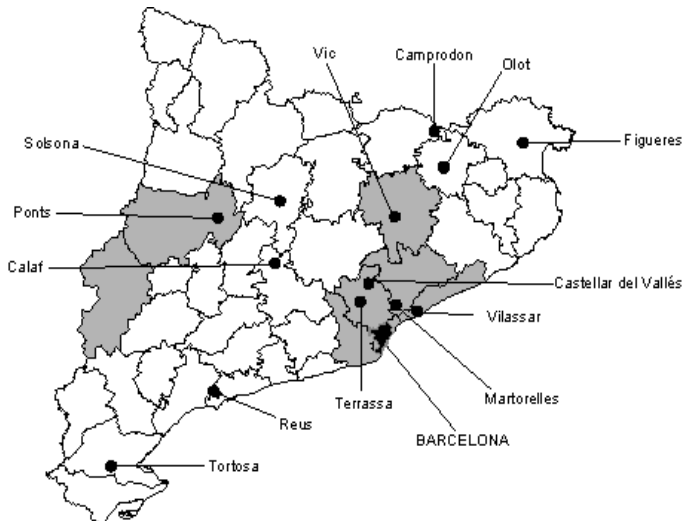


Figure 2: Map of the places referred to in the text.

