

Milk as a Vector of Transmission of Bovine Tuberculosis to Humans in Spain: A Historical Perspective

José Manuel Gutiérrez García

Abstract

As was the case with meat, the detection of the tuberculosis bacterium in cattle resulted in the attribution of an important role to milk in human tuberculosis infection. However, the case of milk had a more serious impact with graver consequences than did meat. In effect, milk was the principal foodstuff by means of which tuberculosis was passed from cattle to humans—indeed it could be said that it was the only effective vector that carried the bovine bacterium to the human organism. In light of this information, this article makes the case that milk acted as the most common means of transmission of bovine tuberculosis to humans, taking particular note of the problem of the hygienic milk supply in Spain.

Milk as a Transmission Agent of Bovine Tuberculosis

It was Robert Koch himself, discover of the tuberculosis bacillus in 1882, who suggested as a control measure the prohibition of the use of milk coming from tuberculous animals. It was no surprise that tuberculous milk became a topic of vital interest in the anti-tuberculosis congresses in Paris (1888) and Lisbon (1895).¹

In 1889, José Bustos echoed the resolutions adopted in the Paris congress, which advised the use, in all cases, of milk that had been previously boiled.² José Moreno Fernández, director of the Seville School of Medicine, pointed out in this same year, that it was important not to lose sight of the data presented in the Paris congress, which indicated that human TB was an almost concomitant affliction with the existence of cows, especially those devoted to dairy production. Nevertheless, he associated the danger of this

food with the fact that the animal had previously developed a tuberculous mastitis.³ This can be explained by the fact that, at the end of the nineteenth century, all authors in Spain agreed that milk from cows presenting with tuberculous mastitis was harmful, there being no unanimous agreement for other forms of the disease. Gradually, the general tendency of veterinary surgeons was to consider this product as harmful in all cases, with some warning of the presence of tuberculous mastitis in apparently healthy cows and others declaring that their research had demonstrated the dangers of this liquid, even when no lesions existed in these glands.⁴

Yet the concept of zoonotic transmission, tenaciously defended by veterinarians and physicians, had doubt cast upon it in 1901, when Robert Koch presented a paper to the London anti-tuberculosis congress in which he rejected the participation of bovine infection in human TB, and suggested that any health control measure adopted for the food vectors was useless.⁵ Despite Koch's position, research being carried out worldwide confirmed that human tuberculosis were being caused by bovine bacilli and that the majority were due to the consumption of untreated milk.⁶

Among the measures that broke the chain of contagion from cattle to humans was found to be the sanitary control of milk, a palliative measure which if not acting on the cause of the problem, did indeed constitute an effective method capable of mitigating its consequences.

In December 1908 a Spanish royal decree was passed entrusting local authorities with the task of overseeing sanitary arrangements for milk,⁷ this being the first measure to regulate the hygienic supply of this foodstuff. Yet this regulation

did not ensure the application of measures that were necessary for the milk to be sufficiently safeguarded from the point of view of defending the health of the consumer. Determining the health condition of the animals, optional according to this ambiguous decree and not aimed at a specific disease, did not manage to prevent the sale of milk that was unsuitable for consumption.

In the 1912 anti-tuberculosis congress, veterinarian Benito Remartinez deplored the fact that Spanish legislation made no allusion whatsoever to milk from tuberculous females, precisely at a time when science had demonstrated the notable part it played in childhood TB.⁸ Cayetano López, Inspector of Livestock Hygiene and Health for Barcelona, criticized the fact that microbial adulterations, and especially chemical ones, took up all the inspection time of the technical staff whose job it was to inspect milk. For this veterinary surgeon, inspection and pasteurization were the key points around which monitoring should revolve, a task which could be undertaken by town councils or by the State itself.⁹

However, this responsibility had already been assigned to the municipalities since the legislation was brought into effect in 1908. This meant that the number of regulations possible could, in theory, be as many as there were local councils. The consequence of this was the proliferation of a host of proclamations, orders, edicts and circulars which in one way or another, referred to the production, supply and monitoring of milk.¹⁰ However, none of these guaranteed the supply of safe milk, since they did not impose the TB test on the livestock or pasteurization.

In 1918, Cesáreo Sanz Egaña condemned the situation in which milk hygiene and monitoring found itself, a situation that he attributed to the slackness of the State and of the majority of municipalities. He added that the inspection of this foodstuff, in the way in which it was carried out in the majority of our cities, was a legal medical investigation but not a health measure. Inspections helped to throw light on the cause of some particular disorder in public health, but hardly ever contributed to preventing the consumption of harmful milk, and there was therefore an urgent need to approach things in a different order, beginning with production, and taking as a first

measure the rejecting of all cattle that were not in perfect health.¹¹ In 1922, Francisco Centrich, a military veterinarian attached to the municipal service of Las Palmas in Gran Canaria, admitted that it had to be confessed that veterinarians had not devoted all the attention to this problem that it deserved, considering its importance: *"Protected by an inadequate legal framework, we have restricted ourselves to waiting until the milk reaches the public market before carrying out our inspections, and it is from here that we attempt, with measures that are almost always inapplicable and invariably useless, to judge the healthiness of milk that is on the point of being consumed."*¹²

Therefore, with the way that the production and sale of milk was organized in the majority of towns and villages, this veterinary surgeon considered that it was impossible to ensure its safety, given that the classical chemical testing that was carried out at points of supply provided no guarantee: *"One only has to have experienced the sanitary testing of milk destined for consumption, to realize the tortures caused by the doubt and unease when faced with milk that is apparently normal, acceptable density, just the right cream levels and admissible acidity, but which comes from cows that one has examined."*¹³

These same worries were shared by Dalmacio García Izcara, as he revealed in the speech he gave at the inaugural session of the National Academy of Medicine in January 1923. García Izcara, a permanent member of the academy, reminded those present of, and reaffirmed, the proposal made by the veterinary section of the San Sebastian congress that had urged the government to make TB testing obligatory for all cows destined for milk production. He criticized the neglected state of such delicate question of public hygiene and cited the Anglo-Saxon countries as an example to follow, being *"those heading the movement that aspires to provide humanity with safe milk."*¹⁴

One of the veterinarians most concerned that milk should be the object of strict control was Josep Vidal Munné, technical officer of the Barcelona Municipal Laboratory. In 1927, this bacteriologist complained that legislators focused on the detection of fraud, with the result that it

was perfectly possible for milk full of microbes to be declared fit for consumption: "*In these conditions, milk is far more harmful than if it had been skimmed or watered down.*"¹⁵

The supply of safe milk required determining the state of health of the cattle and the carrying out of TB testing. This work involved the systematic testing for tuberculosis at all stables, cleaning up positively tested herds and setting up measures designed to prevent infection or re-infection of healthy stables or those that had been made healthy. This was a colossal program that needed methodical, slow and progressive action, and required the consolidation of results and the constant broadening of the field of intervention. Obviously, a program of this magnitude could not be confined to specific municipalities or areas, rather its effectiveness depended directly on inclusion in a vast program which would obligatorily submit all livestock to this diagnostic testing. However, the passivity of state authorities was absolute, and tuberculin for testing difficult to acquire.¹⁶

Nevertheless, the State had an inescapable obligation. By the middle of the twentieth century, numerous experts were suggesting that contagion could be prevented by introducing a system that would control the milk problem once and for all. The governing classes were thus asked to transform dairy production and to create centralized creameries, a type of industry which fitted in with the most up-to-date economic and health currents and was already the norm in almost all of Europe. There were therefore many voices raised demanding the obtaining of pure and healthy milk by means of the centralization of its treatment and subsequent distribution.

The long-awaited reform became a reality in 1952, with the publication by the Ministry of Governance of an order for the setting up of central creameries in municipalities of over 25,000 inhabitants. The Decree of April 18 (*Official Gazette* of May 27) set up what was in practice the first legislation that regulated the milk problem at a nationwide level. This order, complemented by the joint Order of the Ministries of Agriculture and Governance of July 31, 1952 (*Official Gazette* of August 12), came to define an unequivocal position on the supply of milk to large populations, faced with the urgent need to bring to an end such

an anarchic situation.¹⁷ Although this law did not cover a substantial part of the population—those of municipalities of less than 25,000 inhabitants—it marked the starting point from which the carrying out of pasteurization was to become widespread practice.

CONCLUSION

It was milk, in all truth, that was responsible for the majority of TB from bovine origin in humans. This question highlighted the inadequate system of milk production and supply that existed in Spain, the control of which had been entrusted to the municipalities since 1908. However, in general, their methods failed to guarantee the health of the consumer, since they focused on pursuing fraud and ignored the more critical aspects of supply, i.e., the contamination of milk by tuberculosis bacilli from infected cows. This situation remained in force until the 1950s, when the progressive implementation of central creameries enabled the market to be supplied with a safe, heat-treated product.

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ABOUT THE AUTHOR

José Manuel Gutiérrez García, DVS, Department of Medicine History, Faculty of Medicine, Associació Catalana d'Història de la Veterinària (ACHV), Universitat Autònoma de Barcelona, 08193 Bellaterra (Barcelona) Spain.

The Age of Veterinary Specialization

David Gardiner

In the July 1921 issue of *Veterinary Medicine*, L.A. Merillat, one time American Veterinary Medical Association (AVMA^a) president, responded to the following question, "Is Veterinary Practice Keeping Pace with the General Progress of Veterinary Science?" Among the two and a half page answer, the following excerpt stands out:

While it might be a Herculean task for one man to accumulate the large budget of knowledge required to handle successfully every species of domestic animal in all of their infirmities and under all manner of age and condition it must nevertheless be done if we hope for a successful future. The fact that human medicine is splitting up into specialties which sometimes deal with only one disease and always in a single species is often made an excuse for the shortcomings of the

veterinarian who must handle every disease in so many different classes of animals. But this is not an excuse because the same degree of attainment, the same refinement of technic [technique] will never be required of a veterinary practitioner...

There could be no greater calamity to befall the veterinary profession than to allow its integrity to disintegrate into different branches.¹

How differently things have evolved since 1921. The majority of today's veterinary markets not only expects, but demands "the same refinement of technique" as that of human medicine. Furthermore, veterinarians themselves have chosen to "reach the same degree of attainment and refinement of technique" as our human medicine counterparts, if not surpass them in many regards. Nevertheless, Dr. Merillat was correct