

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

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Abstract

If we consult current treatises that address tuberculosis infection by *Mycobacterium bovis*, we find that they neglect meat or accord it very little importance as a vector of transmission of tuberculosis to humans. However, several decades ago, the books of Veterinary Inspection concerning food dedicated numerous pages to tuberculosis in meat and the seizure of consumptive animals. The criteria or attitudes concerning meat from tuberculosis-infected animals have fluctuated over time, from rigorous extremes that, on one hand, required the seizure and destruction of the food products obtained from infected animals from a strictly hygienic measure, to other more practical considerations applying economic arguments, and which accepted the conditional use of these products due to the universal shortage of animal proteins. Consequently, the use or non-use of meat from animals infected with tuberculosis became one of the questions that prompted the greatest concern amongst researches and technicians. It is for these reasons that this paper addresses the history of meat as a vehicle of zoonotic transmission, highlighting its importance and repercussions on health inspections of meat in abattoirs.

Meat as a Transmission Agent of Bovine Tuberculosis

When Robert Koch discovered the causal agent of the disease in 1882, identifying with the same characters in human and animal material, this provoked the question of whether meat from infected animals posed any danger to humans. Alarm grew rapidly, given the high incidence of tuberculous lesions among the cattle being slaughtered in abattoirs, the meat from which entered directly into people's food.

The first guidelines on a world level about tuberculous meats were provided by the first International Tuberculosis Congress (Paris, 1888) and the fifth International Veterinary congress (Paris, 1889), where those attending voted in favour of the seizure and destruction of meat coming

from tuberculous animals.¹ This was the criterion that prevailed among Spanish veterinary surgeons and doctors over the last two decades of the 19th century, who repeatedly demanded the exclusion of this type of meat from public consumption.²

In parallel, studies by numerous researchers revealed that experiments designed to demonstrate the possibility of transmitting the disease by means of tuberculous meat occasionally yielded positive results, but on the majority of occasions produced completely negative effects. This situation enabled it to be inferred that this food product apparently presented less of a danger than had been originally supposed. At a practical level, the result of this was that the idea of eliminating tuberculous meat entirely, defended in the Paris congresses of 1888 and 1889, began to be modified from this time on. Thus such originally thorough conclusions came to be toned down in the sixth and seventh International Veterinary Congresses (Berne, 1895 and Bade-Bade, 1899 respectively), where a certain tolerance was established, recommending the seizure and destruction of animals only when the tuberculous process was widespread, and tolerating the consumption in the remaining cases following sterilisation.³

The first government regulation in Spain dealing with tuberculous meat was the Royal Order of January 31, 1899, which decreed that all infected cattle, without exception, were to be eliminated from the food chain.⁴ This order, which began the first legislative health phase concerning the matter, was born with its days numbered. Thus, at a time when the majority of researchers rejected excessively strict sanitary measures, our country was approving a regulation that ordered the destruction of all cattle with TB. Its repeal came with the enactment of the "Domestic animals health Policy Regulation" (Royal Order of July 3, 1904, or Article 150), which regulated in specific and precise terms the fate of tuberculous meat. In drawing it up, the legislators were inspired by similar legislation in countries which, like France and Germany, applied a rational tolerance

based on the latest scientific understanding about the virulence of said meat. Thus, Article 150 authorised the sale of meat from tuberculous cattle in a wide range of circumstances, following sterilization, but forbade its use in cases where the material could not be submitted for heat treatment due to a lack of equipment.⁵ Despite its more flexible guidelines, Article 150 did not result in a greater usage of tubercular meat. It was precisely the lack of equipment for sterilizing meat that transformed the theoretically tolerant regulation into a severe legislative instrument, since its implementation in abattoirs was essential in order to comply with that set out in Article 150. The only solution was for our installations to have the equipment necessary to carry out the process in the same way as in the world's main abattoirs. As José Barceló, editor of the Spanish veterinary journal *La Revista Veterinaria de España* pointed out in 1910: *"In Berlin, sterilization is already widely practiced and with good results, to the benefit of public hygiene. Could we in Barcelona and Madrid, for instance, not imitate the practices of the Berlin abattoir?"*⁶

This situation remained unchanged with the bringing into effect of the General Regulation for Abattoirs (approved on December 5, 1918), which, in terms of bovine TB, constituted almost an exact copy to that passed 1904. In its Article 59, the new regulation once again allowed for a wide range of cases in which tuberculous meat could be used, once it had been sterilized.⁷ Its strongly disputed stipulations remained in force until 1976 when new regulations were brought into effect.⁸ Spain's strict legislation regarding tuberculous meats represented one of the greatest contradictions of scientific policies about food. Thus, while these strict measures were applied to meat, hardly any attention was paid to milk, the real guilty party in the transmission of the zoonosis. The ingestion of meat and viscera with tuberculous lesions might be harmful, but the practice of eating these products once they had been cooked, minimized the danger. Furthermore, the intermittence with which these foods were consumed, together with their low level of virulence, also had to be taken into account. In consequence, the feared danger from meat, while it did exist in theory, was in fact an exceptional risk that did not justify the excessively strict measures dictated by our health legislation.

In the middle of the 20th century studies emerged that confirmed how unnecessary and

exaggerated such strict measures had been. Veterinary surgeon Cesar Agenjo, in 1942 underlined how we had traditionally fallen into this contradiction of vigorously pursuing the tuberculous cows in the abattoir, while in life these animals were supplying milk that was probably awash with bacilli, whose sale or consumption had been authorized.⁹ Rafael González Álvarez, a professor at the Faculty of Veterinary Science in Madrid, declared in 1948 that the regulations applied in our abattoirs condemned to total seizure many tuberculous cattle that would be "purified" with only a partial seizure.¹⁰ Josep Vidal Munné pointed out in 1951 that the influences exercised by the French decrees of 1896 and 1909 on the drawing up of our Abattoir Regulations had caused the latter to be backward and out of date from the very moment of its enactment. For the ex-president of the Veterinary College of Catalonia, this fact meant that Spain would continue with precepts over fifty years old, with the result that it should surprise no one that the inspectors, being aware of their responsibility, tended to forget the letter of the law, and acted according to a more scientific criterion. He agreed wholeheartedly with Sanz Egaña's affirmation that the better veterinarian was not the one who seized more meat, but rather the one who rationally saved more. Vidal remarked that this was the maxim that should not be forgotten. Finally, he warned that the time had come to renew Spain's legislation, and he provided a number of guidelines that enabled those involved to deduce, from a more rational point of view than that set out in our legislation when a carcass should be made use of or seized in cases where TB lesions were present.¹¹

The words of a Catalan bacteriologist enable us to understand why the overall percentages of TB seizures continued to decrease. Manuel Rodríguez Rebollo, associate lecturer in the Faculty of Veterinary Science in Madrid, stressed that this downward trend had meant that the annual average in Madrid's municipal abattoir between 1958 and 1962 was less than one percent of the cattle slaughtered.¹² In 1955, Sanz Egaña stressed that in abattoirs TB seizures had been carried out for years according to a "broad criterion."¹³

Admitted unambiguously by numerous veterinarians, the supposition that abattoir inspectors were deliberately minimizing meat seizures, was reinforced by the discrepancy that existed between the low official figures issued by

these establishments and the high incidence of bovine TB that were recorded in the first studies carried out by the Office for Livestock during the 1950s.¹⁴ In addition, it is a well known fact that when the first mass tuberculinizations are carried out in a region, very few animals in the abattoir are found to be free of tuberculous lesions, with the latter as a general rule being usually very evident.¹⁵

CONCLUSION

When it was discovered that bovine TB was a zoonosis, one of the questions posed was what the role of meat in the transmission of TB to our own species might be. The action taken for this food was highly controversial and took on a great relevance in congresses and specialized publications. The opinion of veterinary surgeons was divided between strict and more tolerant approaches. The idea that meat consumption was highly dangerous was widespread in the years immediately following the discovery of the bacillus. Nevertheless, this concept evolved over the years. In fact, from the theoretical point of view there was no doubt that meat from tuberculous cattle could be carrying virulent bacilli in demonstrable quantities and could constitute a possible means of human contagion. Yet it was also true that meats were weakly contaminated and were usually consumed after being submitted to thermal treatment, which eliminated or attenuated their danger. Consequently, the intervention of meat as a transmission vector of bovine TB to humans was far from having the importance of milk and its derivatives. Nevertheless, Spanish legislation on meat was very strict. In addition, the fact that the same regulations remained in force for over half a century meant that they would soon become out of step with other European nations, since a constant stream of scientific discoveries modified the criteria regarding the various TB lesions and their sanitary importance.

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