




Incidence and evolution of the number of cases of bovine tuberculosis in the municipality of Unaí-MG - period 2013-2015

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Summary

In this work an approach is made on bovine Tuberculosis and its cause and consequence for the affected cattle, the disease is caused by a pathogen, *mycobacterium bovis*, a bacilliform gram-positive bacterium that lodges in macrophages, and attacks mainly the respiratory system, whose frequent clinical signs are: progressive cachexia, short and repeated dry cough, low respiratory capacity and localized or generalized lymphadenopathy may also occur. *mycobacterium bovis*, which causes tuberculosis in cattle, is highly resistant and can live for several months in stables, for example, sheltered from light. It occurs through the digestive tract mainly in calves that feed on milk from cows with tuberculous mastitis and animals that ingest contaminated water and fodder. With the results obtained, one can see the great relevance of the disease for the region of Unaí-MG, and that its control through the

elimination of positive foci proves to be an effective method against the proliferation of bovine tuberculosis.

Keywords: Incidence. Tuberculosis. Bovine.

Resumo

*Neste trabalho é feita uma abordagem sobre Tuberculose bovina e sua causa e consequência para os bovinos acometidos, a doença é causada por um patógeno, a *Mycobacterium bovis*, uma bactéria gram-positiva baciliforme que se aloja em macrófagos, e ataca principalmente o aparelho respiratório, cujos sinais clínicos freqüentes são: caquexia progressiva, tosse seca curta e repetida, baixa capacidade respiratória e também pode ocorrer linfadenomegalia localizada ou generalizada. A *Mycobacterium bovis* causadora da tuberculose em bovinos apresenta grande resistência podendo viver por vários meses em estábulos, por exemplo, no abrigo da luz, a principal via de contaminação dos animais é a respiratória, quando estes inspiram aerossóis de animais acometidos com a doença mas também se dá pelo trato digestivo principalmente em bezerros que se alimentam de leite proveniente de vacas com mastite tuberculosa e animais que ingerem água e forragem contaminados. Com os resultados obtidos, percebe-se a grande relevância da enfermidade para região de Unaí-MG, e que seu controle através da eliminação de focos positivos se demonstra como método eficaz contra a proliferação da tuberculose bovina.*

Palavras-chave: Incidência. Tuberculose. Bovina.

Introduction

With the objective of evaluating the number of cases of bovine tuberculosis in the region of Unaí-MG, a previous collection of data was carried out, together with the IMA (Instituto Mineiro de Agropecuária), to obtain the sample and evaluate the number of cases in line with the the number of animals present in the sample and submitted to the examination in relation to the total number of cattle respectively present and registered with the IMA in the region (Beaunée et al., 2017). The work reveals the current situation in terms of the number of tuberculous animals in relation to the sample and demonstrates how this zoonosis becomes worrying for the region, since in addition to causing great economic losses and disposal of animals, the disease from *Mycobacterium bovis* also contaminates the humans by consuming food from contaminated cattle and also for those who have direct contact with these animals such as producers, cowboys, veterinarians and people who have direct or indirect contact with these animals (Caws et al., 2008). The great fate of carrying out the test and which intimidates producers from carrying it out is due to the fact that animals detected positive must be sent to slaughter, however, the indemnities paid to the producer are not very significant in relation to the absolute value of the animal in addition to very bureaucratic. Factors such as these make it impossible to drastic eradicate bovine tuberculosis and to eliminate contaminated animals, active transmitters of the disease

Bovine tuberculosis is an important zoonosis that directly affects livestock production, causing losses to producers whose herds are affected. In addition to being a source of infection for humans, bovine tuberculosis causes great economic losses resulting from: death of animals, drop in weight gain, decrease in milk production, early culling of animals of high zootechnical value and condemnation of carcasses in slaughterhouses (DeCock, 1992). In 1986, the USA calculated that the benefits of

eradicating bovine tuberculosis could reach 300 million dollars (Gagneux et al., 2006). In order to evaluate the evolution of the incidence of bovine tuberculosis in Unai-MG, students of the 2nd period of Veterinary Medicine under the guidance of professors Pedro Angelo Junior and Lysandra Martineli Fonseca.; instituted in the 2nd semester of 2015 the carrying out of the scientific work .

Tuberculosis is an infectious disease caused by bacteria of the *Mycobacterium complex tuberculosis* , belonging to the *Mycobacteriaceae family* . These are short aerobic, immobile, non-capsulated, non-flagellated rods, with a granular appearance when stained, measuring 0.5 to 7.0 μm in length by 0.3 μm in width. Alcohol-acid resistance is its most characteristic property. The M. tuberculosis complex is formed by the microbacteria M. tuberculosis , M. bovis and M. *africanum* , which are the main causes of tuberculosis in mammals (Van Soolingen et al., 1991). Tuberculosis caused by M. bovis is a zoonosis with a chronic evolution that mainly affects cattle and buffaloes. They are characterized by the progressive development of nodular lesions called tubercles, which can be located in any organ or tissue (Ramos , et al., 2006). The objectives proposed in this article are: To quantitatively analyze the cases of bovine tuberculosis in the municipality of Unai - MG in the period from 2013 to 2015; evaluate the evolution of the number of cases of the disease in the interval of the mentioned years; and transmit essential information about the disease and its importance for the region.

Methodology

As for the technical procedures, a battery of argumentative meetings was adopted with the presence of the advisors, aiming at a better way of collecting the sample and how it would be representative, being able to consolidate with a low margin of error since it is a quantitative work.

With the adoption of the appropriate sampling technique, a previous technical visit to IMA was carried out, with the presence of co-advisor Lysandra Martinli Fonseca, who presented all the institute's procedures regarding bovine tuberculosis and the challenges present in combating it, pondering the importance of zoonoses in public health and also its consequences for the entire cattle production chain, mainly dairy, which in turn dominates the region of Unai-MG.

Subsequently, the visits to the IMA were in favor of collecting data, found in folders, in which the following necessary information was obtained:

- year of the exam;
- number of animals submitted to tuberculinization for diagnosis of the pathology;
- number of negative animals;
- number of direct positive animals;
- amount of inconclusive animals;
- result of the examination of inconclusive animals, submitted to retest.

After obtaining the data, all were separated according to the year of the examination, with that the total number of animals submitted to the examination was calculated and the percentage of the sample in relation to the total of animals was obtained through calculations. present and registered in the region. After that, the percentages of positive, negative and inconclusive animals were calculated in relation to the total number of animals in the sample and later the data were plotted in graphs, for better interpretation and understanding (Wang et al., 2007)

Development

In the region of Unaí-MG, currently, 364,473 heads of cattle are registered, which are present in 3102 properties and the creators add up to a total of 3281.

To carry out the bovine tuberculosis tests mentioned in this work, only qualified Veterinarians can perform the tests and diagnose the animals, if an animal is detected positive, the Veterinary Doctor has 24 hours to notify the animal to the IMA, if it is inconclusive this too must notify the IMA and after 60 days the same Veterinarian must retest the animal (Zhao et al., 2012).

For this training to take place, the Veterinarian must complete the Training Course on Methods for Diagnosis and Control of Brucellosis and Tuberculosis and Notions on Transmissible Spongiform Encephalopathies, the course being available in four locations in Minas Gerais, which are: Universidade Federal de Minas Gerais in Belo Horizonte, Sociedade Educacional Uberabense in Uberaba, Embrapa Gado de Leite in Coronel Pacheco, Pontifical Catholic University of Minas Gerais in Betim.

After the proper collection of samples from animals that underwent clinical examination for the diagnosis of tuberculosis, the results are presented with indices of great relevance, both for animal health and for human health in the region, and large proportions of human infection may occur. and animals by the self-infectious power of *Mycobacterium bovis* (Raviglione , 1995).

The sample percentages in relation to the total number of individuals duly registered in the region with the IMA appear to be small at first glance, but it should be noted that the number of producers who undergo tests for the diagnosis of tuberculosis is reflected in a small portion, and therefore the number of animals examined and tested for tuberculosis is low, thus ensuring great representativeness for the samples and reliability for the indices discussed.

Regarding the total number of positive animals compared to the total number of animals tested, the values obtained were quite significant. In 2013, the number of positive animals is equivalent to 13.9% of the total number of animals tested. This number may be even higher since 9.4% of the animals had inconclusive tests as a result, without any retesting. In 2014, the number of positive animals is equivalent to 9.5% of the animals tested. The number of inconclusive tests without their being retested was equivalent to 1.4%.

In 2015, the number of positive animals is equivalent, so far, to just over 1% of the animals tested. The data analysis is unequivocal. Of the 608 cases of bovine tuberculosis registered in the municipality of Unaí, 512 cases are concentrated in just 6 breeders. The equivalent of almost 90% of all cases.

Table 1: Number of positive cattle in the bovine tuberculosis test in the municipality of unai -MG, in relation to the analyzed animals.

Year	total number of animals	Animals analyzed	negatives	Positives	inconclusive
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2013	343640	1607	1232(77%)	224(14%)	151(9%)
1014	352961	3767	3359 (89%)	356(9%)	52(1%)
1015	364473	2251	2208(97%)	28(1.5%)	15(1%)

Source: the authors

Final considerations

Data analysis allows us to make some inferences:

1- The municipality of Unaí had a high incidence of bovine tuberculosis between 2013 and 2015, highly concentrated in a few producers

2 - The number of animals tested is small due to the inefficiency of the National Program for the Control and Eradication of Brucellosis and Tuberculosis (PNCEBT) due to three factors:

- _ non-compulsory examination;
- _ the retest is not mandatory;
- _ low reimbursement to the producer.

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