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## A tentative case of tuberculosis detected at postmortem examination of animal carcasses slaughtered at some local slaughter slabs in north-western Nigeria

S. A. Hena<sup>a,\*</sup>, B.K. Tanimomo<sup>b</sup>, R. Tarhyel<sup>c</sup>, E.O. Ngbede<sup>d</sup>, O.O. Oluwasina<sup>a</sup>

<sup>a</sup>Department of Animal health and Production, College of Agriculture and Animal Science, Bakura

<sup>b</sup>Department of Animal health and Production, Faculty of Veterinary Medicine, University of Abuja

<sup>c</sup>Department of Animal Science, Faculty of Agriculture, University of Maiduguri, Borno State

<sup>d</sup>Department of Veterinary Microbiology, Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria

\*Corresponding author; Department of Animal health and Production, College of Agriculture and Animal Science, Bakura; Tel.: +2348060524623

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### ABSTRACT

This study was carried out in Bakura local government area of Zamfara State, Nigeria, where a total number of 592 cattle carcasses were sampled at different slaughter slabs for a period of six months, out of the cattle carcasses sampled at postmortem examination, 28 were found positive with granulomatous lesions as seen in bovine tuberculosis. Similarly, 910 sheep were sampled with 9 cases positive for tuberculosis and with a prevalence rate of 0.99%. In this study also, a total number of 894 goats were sampled with 12 goats being positive for tuberculosis and a prevalence rate of 1.34% was recorded for the total goats sampled. The diagnoses were however tentative, based on the presented gross tubercle lesions as seen on the carcasses. Tuberculosis is a zoonotic disease which affects human being as well as animals; it is of public health importance and hence the public, more especially, butchers and other abattoir workers need to be properly enlightened on the risks associated in handling infected carcasses or animals. Although, the study area is a microcosm of the society, it represents a picture of prevalence of the disease in the state. The result obtained can be used to extrapolate other parameters in determining the extent of the spread of tuberculosis in both animal and human population. Though, routine

meat inspection is not confirmatory (Isolation and identification of the organism is the gold standard) it is to be noted that the presence of other bacteria like nocardia could present similar nodular lesions. This becomes useful since most slaughter houses and abattoirs here in Nigeria do not have facilities to confirm tuberculosis and similar chronic infections. This call for proper meat inspections procedures which if properly carried out could identify most of animals with visible tuberculous lesions.

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## 1. Introduction

Tuberculosis (TB) is a chronic infectious and contagious zoonotic disease of domestic animals, wild animals and humans (Radostits *et al.*, 2007). In a large number of countries bovine tuberculosis is a major infectious disease among cattle, other domesticated animals, and certain wildlife populations. Transmission to humans constitutes a public health problem. It is characterized by the formation of granulomas in tissues especially in the lungs, lymph nodes, intestines, liver and kidney. Although commonly defined as a chronic debilitating disease, tuberculosis can occasionally assume a more progressive course. Body part or organ can be affected, but lesions are most frequently observed in the lymph nodes (particularly of the head and thorax), lungs, intestines, liver, spleen, pleura, and peritoneum (Shirtaye *et al.*, 2007). It is caused by *Mycobacterium bovis* which is a member of *Mycobacterium tuberculosis* complex, cattle are the primary hosts for *M. bovis*, but other domesticated and wild mammals can also be infected. Tuberculosis is widely distributed throughout the world with serious effect on animals and is also of significant public health importance (O'Reilly and Daborn, 1995).

Tuberculosis in cattle and other animals is an endemic problem here in Nigeria and very little has been known about the true epidemiology of the disease in the country (Dusai and Abdullahi, 1994; Cadmus *et al.*, 2004; Abubakar, 2007) and where there is no control or eradication policy on animal tuberculosis (Cosivi *et al.*, 1998). Its zoonotic importance constitutes an important public health problem (Thoen *et al.*, 2006). Human tuberculosis of animal origin, particularly that caused by *Mycobacterium bovis* has become more important since the emergence of HIV/AIDS (O'Reilly and Daborn, 1995; WHO, 2006) and its associated potentiating of this disease. In human, tuberculosis, caused by *Mycobacterium tuberculosis* is the second leading cause of mortality worldwide, especially in Asia and Africa. Globally 9.2 million new cases and 1.7 million death from tuberculosis occurred in 2002, of which 0.7 million cases and 0.2 million deaths were in HIV positive cases (WHO Report, 2006). Adequate palpation of lesions at post mortem examination with production of gritty sound on incision of some of the lymph nodes and other visceral organs form the basis of tentative diagnosis of tuberculosis in animals. Tuberculous lymph node lesions have a characteristic cream to yellowish colour and vary in consistency from "thick cream to crumbly cheese". The caseous material is often calcified and may be surrounded by a fibrous capsule (Special Issue, 1986). This form of diagnosis, though not confirmatory, helps to a great extent in reducing the extent of the disease in cattle and its potentials for spread to humans and other animals in this country. This becomes useful since most of the abattoir and slaughter houses do not have diagnostic facilities to confirm tuberculosis in animals.

Evidences of works seen on: Retrospective Study of Tuberculosis in Slaughtered Cattle at Maiduguri Abattoir, Nigeria by Abubakar *et al.*, (2011), a prevalence study of bovine tuberculosis by using abattoir meat inspection and tuberculin skin testing data, histopathological and IS1610 PCR examination of tissues with tuberculous lesions in cattle in Ethiopia by Shirtaye *et al.*, (2007) and retrospective studies of bovine tuberculosis in cattle at Gombe township abattoir, Gombe state by Abubakar *et al.*, (2009), but no work has been seen by the authors on the detection of tuberculosis from animal carcasses at postmortem inspection in this study area. According to Corner, (1994), when meat inspection procedures are properly carried out, about 95% of cattle with visible lesions compatible with bovine tuberculosis can be identified. It is therefore, imperative that simple and inexpensive method for diagnosis of bovine tuberculosis in the local abattoir and slaughter houses be considered. One of the most efficient and practical way of doing this is through meat inspection to detect the gross suspected tuberculous lesions. This study is to provide data on prevalence of TB in the studied area and in addition, to improve on meat

inspection technique in identification of TB infected carcasses by personnel concerned with the meat inspection in the abattoir.

## 2. Materials and methods

This study was carried out for a period of six months in Bakura local government area of Zamfara State, Nigeria, where slaughter slabs in six villages were surveyed viz: Bakura, Damri, Birnin Tudu, Rini, Madaci, and Gamji villages. In this study, cattle, sheep and goats from these study areas were screened at post mortem examination to determine the presence of gross lesions of tuberculosis during routine meat inspection. The gross lesions were observed physically to determine whether or not there are the presences of tubercles or granulomas, which are comprised of a caseous necrotic core, surrounded by a zone of inflammation, from different parts and organs of the body particularly the lymph nodes of the head and thorax, lungs, intestines, liver, spleen, pleura, and peritoneum. Total number of animals surveyed and the number of suspected positive samples were recorded, based on the observed gross lesions indicative of tentative tuberculosis cases, from which the prevalence rate was calculated using a simple statistical tool and recorded in percentage.

## 3. Results and discussion

The data obtained as shown in Tables 1, indicated the distribution of cases of tuberculosis with regards to location, animal species and their respective prevalence rates (%). Table 2 clearly indicated that a total number of 592 cattle carcasses were sampled out of which 28 were found positive with granulomatous lesions as seen in bovine tuberculosis, shown on plates 1 and 2, with a total prevalence rate of 4.73% (for all the cattle carcasses sampled from all the slaughter slabs studied). This agrees with a report from OIE Terrestrial Manual (2009) that states that at necropsy, tubercles are most frequently seen in bronchial, mediastinal, retropharyngeal and portal lymph nodes. In addition, the lung, liver, spleen and the surfaces of body cavities like the thoracic cavity as shown on plate 2 are commonly affected. Early nodular pulmonary lesions can often be detected by palpation. The lesions are usually non-odoriferous. Other anatomical sites can be infected and should be examined.

**Table 1**

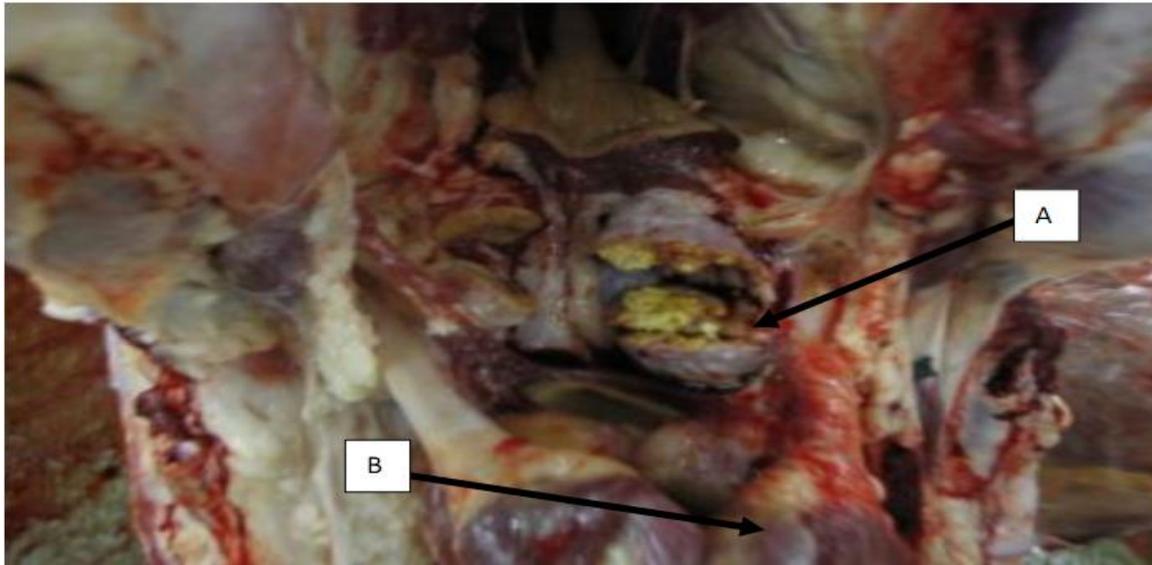
Distribution of tuberculosis cases per location and animal species and respective prevalence rates (%).

Location	Animal species	No. of Animals sampled	No. of +ve cases for TB	No. of -ve cases	Prevalence rate (%)
Bakura	Cattle	130	5	125	3.85
	Sheep	224	2	222	0.89
	Goat	257	0	257	0.00
Damri	Cattle	87	8	79	9.19
	Sheep	12	3	125	2.34
	Goat	98	0	98	0.00
Madaci	Cattle	89	2	87	2.25
	Sheep	100	0	100	0.00
	Goat	85	1	84	1.18
Gamji	Cattle	90	3	87	3.33
	Sheep	145	0	145	0.00
	Goat	167	6	161	3.59
Rini	Cattle	120	5	115	4.17
	Sheep	190	4	88	2.10
	Goat	187	3	184	1.60
Birnin Tudu	Cattle	76	5	71	6.58
	Sheep	123	0	123	0.00
	Goat	190	2	188	1.05

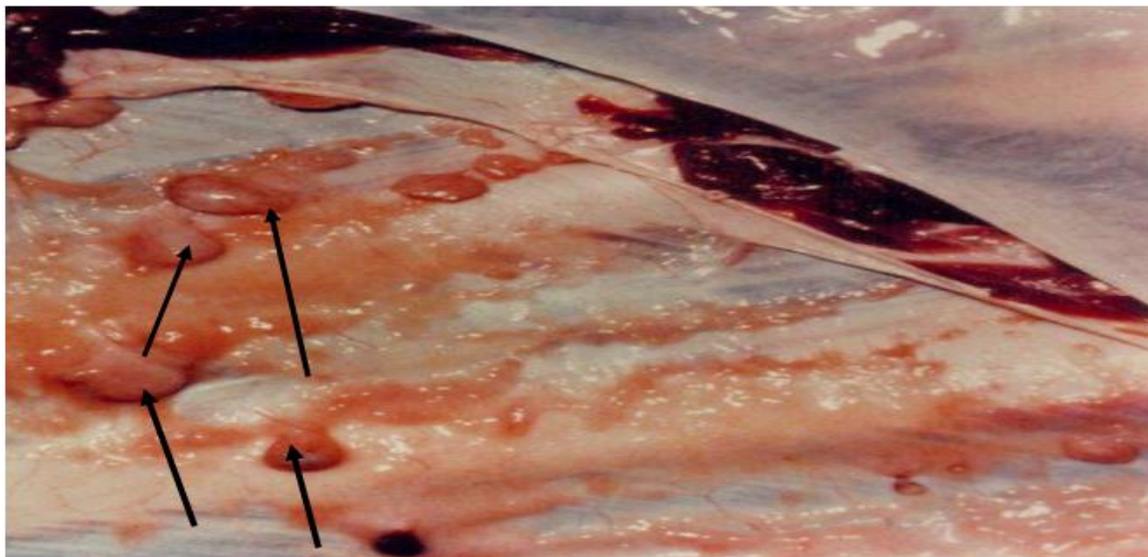
**Table 2**

Total number of animals sampled, positive and negative cases and the prevalence rates.

Animal species	Total No. of animal sampled	Total No. of +ve samples	Total No. of -ve samples	Total prevalence rates (%)
Cattle	592	28	564	4.73
Sheep	910	9	901	0.99
Goat	894	12	882	1.34



**Plate 1.** Tubercles in lymph node (A-arrow) and on testis (B-arrow), cattle carcass (Magnification x125).



**Plate 2.** Some granulomatous lesions distributed along ribs (Arrows), Magnification x125.

The total numbers of sheep sampled were 910 with 9 cases positive for tuberculosis and a prevalence rate of 0.99%, while a total number of 894 goats were sampled with 12 goats being positive for tuberculosis based on the presented tubercle lesions, and a prevalence rate of 1.34% was recorded for the total goats sampled. This finding agrees with the work of O'Reilly and Daborn, (1995). Although cattle are considered to be the true hosts of *M. bovis*, the disease has been reported in many domesticated animals such as from sheep and goats as seen in this

study. In Nigeria, cattle are usually slaughtered in abattoirs where the butchers most often wear minimal protective clothing and process meat with their bare hands, thus suspected gross tuberculous lesions in slaughtered animal at abattoir constitutes great threat of contracting the disease by the public especially abattoir workers and butchers. It has further confirmed that control measures are not in place or inadequately applied because in countries where control of tuberculosis is in place, detection of gross lesions at the abattoir during meat inspection is usually very minimal. This finding also agrees with an earlier suggestion that abattoir monitoring could be an essential element in the national tuberculosis campaign and the most effective means of detecting residual infection especially in countries that have achieved control of the disease (Corner *et al.*, 1990).

#### 4. Conclusion

Tuberculosis is a zoonotic disease which affects human being as well as animals; it is of public health importance. A lot of works had been published on its aetiology as well as mode of transmission between animal and human factors. The work done was only carried out on post-mortem inspection and carcasses found pathologic with tubercular lesions were totally condemned. This is contrary to general judgement of passing such carcasses, while condemning the affected organ. If stamping out or eradication of TB in human population is to be achieved, then, outright condemnation of infected carcasses should be employed by health personnel on diagnosis of this condition. On the other hand, farmers/butchers should be adequately compensated by appropriate authority for their condemned animal carcass(es) which will ultimately encourage co-operation between farmers and health bodies in eradication of the disease. Although, the study area is a microcosm of the society, it represents a picture of prevalence of the disease in the state. The result obtained can be used to extrapolate other parameters in determining the extent of the spread of tuberculosis in both animal and human population. Though, routine meat inspection is not confirmatory (Isolation and identification of the organism is the gold standard) it is to be noted that the presence of other bacteria like nocardia could present similar nodular lesions. This becomes useful since most slaughter houses and abattoirs here in Nigeria do not have facilities to confirm tuberculosis and similar chronic infections. This call for proper meat inspections procedures which if properly carried out could identify most of animals with visible tuberculous lesions.

#### References

- Abubakar, U.B., Shehu, S. A., Mohammed, F.U., 2011. Retrospective Study of Tuberculosis in Slaughtered Cattle at Maiduguri Abattoir, Nigeria. *Vet. Res.* 4(1),1-4.
- Abubakar, U.B.I., Ibrahim, S., Kudi, A.C., Okaiyeto, S.O., Abdulrahman, M., Malle, B., 2009. Retrospective studies of bovine Tuberculosis in cattle at Gombe township abattoir, Gombe state. In: The proceedings of the 46th annual congress of the Nigerian Veterinary medical Association, Anambra 2009, Pp, 89-91.
- Shirtaye, J.E., Getahun, B., Alemayehu, T., 2006. A prevalence study of bovine tuberculosis by using abattoir meat inspection and tuberculin skin testing data, histopathological and IS1610 PCR examination of tissues with tuberculous lesions in cattle in Ethiopia. *Vet. Med.* 51,512-522.
- Radostits, O.M., Blood, D.C., Hinchcliff, K.W., Gay, C.C., 2007. A Textbook of the Diseases of cattle, Sheep, pigs, Goats, and Horses. Bailliere-Tindall, London, Pp, 1763.
- O'Reilly, L.M., Daborn, C.J., 1995. The epidemiology of Mycobacterium bovis infection in animals and man: A review. *Tuber. Lung Dis.* 76,1-46. [http://dx.doi.org/10.1016/0962-8479\(95\)90591-X](http://dx.doi.org/10.1016/0962-8479(95)90591-X)
- OIE Terrestrial Manual, 2009. Bovine tuberculosis, Chapter 2.4.7. Pp 1-16.
- Dusai, D.H.M., Abdullahi, D.A., 1994. Current status of bovine tuberculosis at Sokoto abattoir. *Trop. Vet.* 12,134-137.
- Cadmus, S.I.B., Atsanda, N.N., Oni, S.O., Akang, E.E.U., 2004. Bovine tuberculosis in one cattle herd in Ibadan, Nigeria *Vet. Med. Czech.* 49, 406-412.
- Abubakar, I.A., 2007. Molecular epidemiology of human and bovine tuberculosis in the federal capital territory and Kaduna state, Nigeria. PhD thesis, Plymouth University, UK.
- Cosivi, O., Grange, J.M., Daborn, C.J., Raviglione, M.C., Fujikura, T., 1998. Zoonotic tuberculosis due to Mycobacterium bovis in developing countries. *Emerg. Infect. Dis.* 4,59-70. <http://dx.doi.org/10.3201/eid0401.980108>

- Toen, C.O., Steele, J.H., Gilsdorf, J.M., 2006. *Mycobacterium bovis* Infection in Animals and Humans. 2nd Edn, Blackwell Publishing Professional, Ames, Iowa, USA., P 317.  
<http://dx.doi.org/10.1002/9780470344538.index>
- WHO, 2006. Global Tuberculosis Control: Surveillance, Planning, Financing. WHO/HTM, Geneva, p 362.
- Corner, L.A., 1994. Post mortem diagnosis of *Mycobacterium bovis* in cattle. *Vet. Microbiol.* 40,53-63.  
[http://dx.doi.org/10.1016/0378-1135\(94\)90046-9](http://dx.doi.org/10.1016/0378-1135(94)90046-9)
- Special Issue, 1986. Diagnosis of bovine tuberculosis. *Surveillance.* 13(3),16.
- WHO Report, 2006. Global Tuberculosis Control: Surveillance, planning, financing. Geneva: World Health Organization. Available at:  
[http://www.who.int/tb/publications/global\\_report/2008/pdf/Fullreport.pdf.html](http://www.who.int/tb/publications/global_report/2008/pdf/Fullreport.pdf.html)