

Prevalence of Pulmonary Tuberculous Lesions in Cattle Slaughtered in Abattoirs in Northeastern Nigeria

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Key words

Cattle – Tuberculosis – Abattoir – Morbidity – Nigeria.

Summary

A survey of tuberculosis in cattle was carried out in four abattoirs located in Maiduguri, Damboa, Damaturu and Gashua in Northeastern Nigeria from 1994 to 1998. Out of 1,698,000 slaughtered head of cattle examined at postmortem, 2.8% (95% confidence interval: 2.76–2.84) had pulmonary tuberculous lesions. The prevalences varied from 1.9% in Damaturu abattoir to 20.0% in Damboa abattoir. The annual prevalences during the study period varied from 2.3 to 4.7%. The monthly prevalences showed sporadic high prevalences above the endemic level. It is concluded that bovine TB is still endemic in the region with indications of epidemic proportions existing in Damboa area. Therefore, it is necessary for the Federal Government to consider and implement control measures to limit the spread of the disease among cattle and to human populations.

INTRODUCTION

Bovine tuberculosis (TB) is an endemic bacterial disease of cattle in Nigeria judging from the reported prevalence from various abattoirs in the country (1, 2, 3, 8, 9). Bacteriological isolation of the causative bacteria is the only way to make a definitive diagnosis of TB (6). The only available report in Nigeria of diagnosis of bovine TB by bacterial culture from abattoir specimens showed that *Mycobacterium bovis* was isolated in 62.5% of cases, *M. tuberculosis* in 14.0%, and *M. avium* and unclassified mycobacteria in 9.5% (4).

Monitoring bovine TB prevalence by bacteriological examination may not be feasible in Sub-Saharan Africa because mycobacterial culture is expensive, time-consuming and often unsafe in inadequately constructed and equipped laboratories. Therefore, in countries with endemic bovine TB, postmortem diagnosis by detection of gross lesions has been proposed (6).

There are no apparent strategic control measures for bovine TB in countries where regular surveillance for the disease is necessary.

With the emergence of the acquired immunodeficiency syndrome and the increasing focus on the epidemiology of human TB (5), the need to follow up on the prevalence of bovine TB in areas where there is a zoonotic risk cannot be overemphasized. The prevalence of bovine TB based on postmortem examination of carcasses at slaughter in Maiduguri abattoir has been documented (1, 3, 9).

MATERIALS AND METHODS

The present study reports on the prevalence of bovine TB in four abattoirs in Northeastern Nigeria, two from Borno States in Maiduguri and Damboa, and two from Yobe State in Damaturu and Gashua (figure 1), between 1994 and 1998, with reference to variations, which may have occurred over time and from place to place. The four abattoirs were under the supervision of the Ministry of Animal and Forestry Resources of the State Governments. Qualified veterinarians, who serve as meat inspectors, conducted postmortem examinations of slaughtered cattle.

Members of the research team visited the various abattoirs after obtaining permission from the relevant Authorities, liaised with the abattoir veterinarians and collated the required data. The relevant data (daily, monthly and yearly) retrieved from the abattoir records were the number of cattle slaughtered and examined postmortem,

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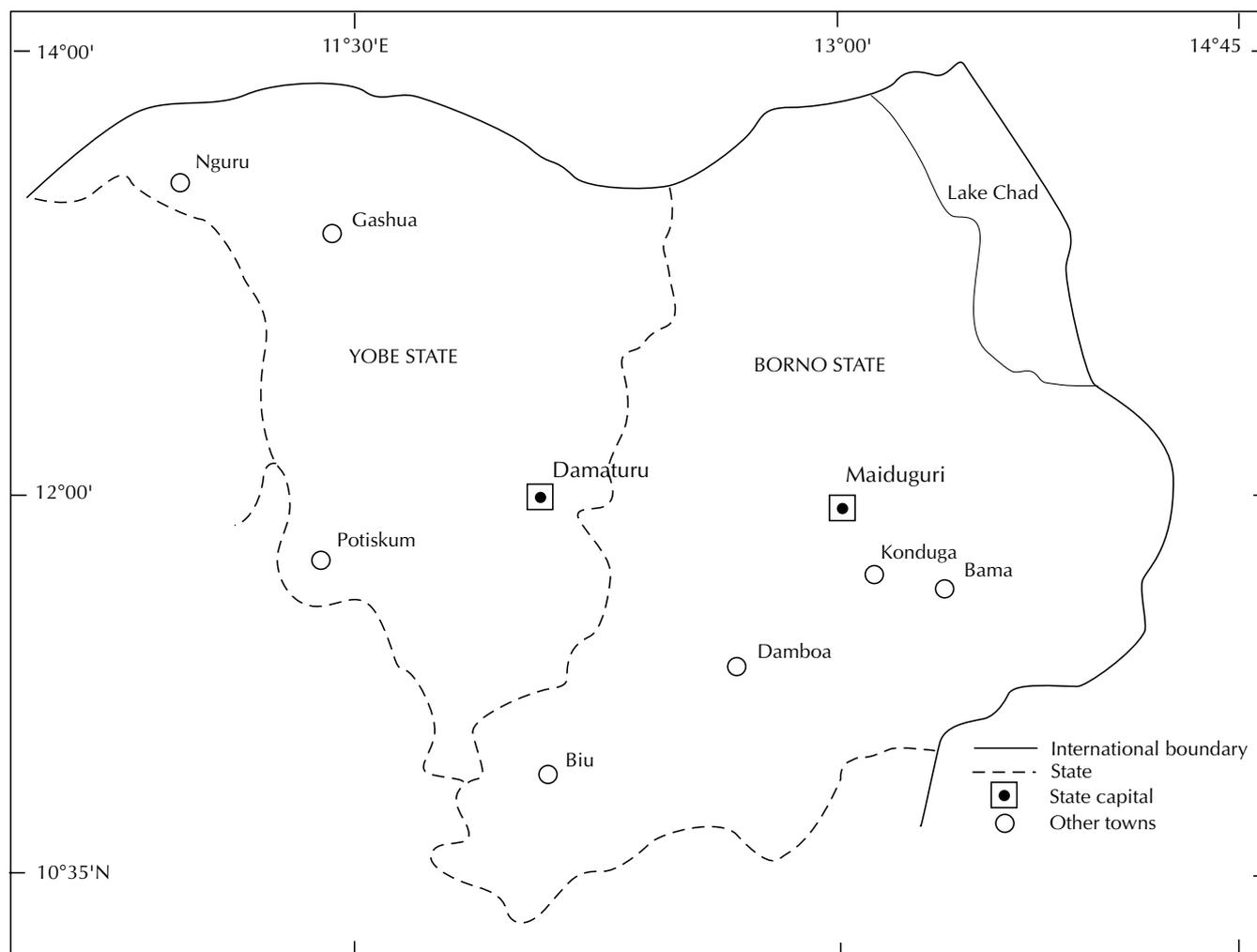


Figure 1: Map of Yobe and Borno States in Nigeria showing the location of the towns with the abattoirs.

and the number with suspect TB miliary abscesses or tubercles in the lungs and associated lymph nodes (6).

The prevalence in percentage was calculated as the number of cattle with suspect pulmonary TB lesions divided by the number of cattle slaughtered and examined at postmortem within the specific period. The binomial confidence intervals for the overall prevalence at a 95% level of confidence were determined (10).

■ RESULTS

The prevalence of pulmonary TB cases was 2.8% in cattle slaughtered in abattoirs located in Maiduguri, Damboa, Gashua and Damaturu in the period 1994 to 1998 (Table I). The annual prevalence varied from 2.3 to 4.7%, whereas, the overall prevalence for each abattoir varied from 1.9% in Damaturu to 20% in Damboa. The monthly prevalence also varied widely between abattoirs (Figures 2-5). The highest monthly prevalence for each year (Table II) ranged from 2.0% in Damaturu to 70% in Damboa, an astonishingly high rate that could not be investigated in the present study as no distinction could be made between locally raised and imported cattle.

Some TB cases had lesions in organs other than the lungs and, occasionally, whole carcass condemnation was recommended. Extensive lesions that warranted whole carcass condemnation occurred in Damboa abattoir (1.6%), but were rare in Maiduguri, Damaturu and Gashua abattoirs. Other organs apart from the lungs where tuberculous granulomas occurred were the liver, kidney,

spleen, gastrointestinal tract, omentum, lymphnodes, udder and uterus. Cutaneous granulomas and indurations frequently associated with bovine farcy were not observed.

■ DISCUSSION

Bovine TB in this study primarily appeared in the pulmonary form since TB cases invariably had lesions in the lungs and associated lymph nodes with occasional lesions in other organs. Thus, pulmonary TB lesions were empirically indicative of bovine TB prevalence among slaughtered cattle (7). Corner reported that up to 95% of the cattle with visible TB lesions could be identified by examination of the lung and the associated lymph nodes (6). TB prevalence might be underestimated in tuberculous cattle because of undetected lesions in early infection or because small lesions might be missed as a result of poor postmortem techniques or meat inspectors being discountenanced under pressure from butchers (7).

In earlier studies, in Maiduguri abattoir during the periods 1982 to 1986 (9) and 1985 to 1988 (3), a prevalence of 2.2% was reported for each period. The annual prevalences varied between 1.3 and 4.2% in the two study periods. In the present study, the overall and annual prevalences were comparable to these earlier reports (3, 9).

TB prevalence in Damaturu, Gashua and Damboa abattoirs had not been reported earlier. The total prevalence in Damaturu abattoir (1.9%) for the study period (1994 to 1998) was the lowest compared with values from the other abattoirs. The prevalence in Gashua abattoir (2.6%) was similar to that in Maiduguri (2.5%), but higher

Table I

Prevalence of suspected pulmonary tuberculosis in cattle slaughtered at four abattoirs in Northeastern Nigeria (1994-1998)

Location of the abattoir	1994		1995		1996		1997		1998		All years	
	Prev. ¹ (%)	Num. Ex. ² (x10 ³)	Prev. (%)	Num. Ex. (x10 ³)	Prev. (%)	Num. Ex. (x10 ³)	Prev. (%)	Num. Ex. (x10 ³)	Prev. (%)	Num. Ex. (x10 ³)		
Maiduguri 95% CI ³	2.9	21.6	3.1	34.0	2.2	38.7	1.6	36.8	4.3	12.3	2.5	143.3 2.46–2.54
Damboa 95% CI	nd ⁴		nd		8.8	1.2	30.2	1.0	22.3	1.1	20.0	3.3 19.3–20.7
Gashua 95% CI	nd		3.5	1.9	5.5	2.4	1.8	6.3	1.4	3.4	2.6	13.9 2.47–2.74
Damaturu 95% CI	1.2	2.5	1.9	1.9	2.2	1.8	2.3	1.8	2.3	1.3	1.9	9.3 1.76–2.04
All abattoirs 95% CI	2.8	24.1	3.1	37.8	2.6	44.1	2.3	45.9	4.7	18.1	2.8	169.8 2.76–2.84

¹ Prevalence; ² Number examined; ³ Confidence interval; ⁴ No data

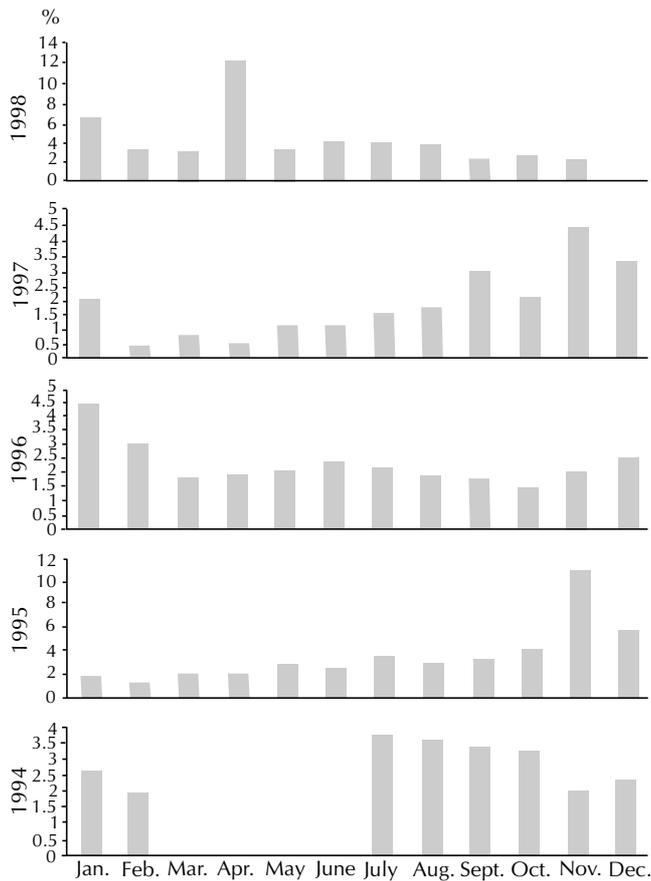


Figure 2: Monthly prevalence of pulmonary TB cases in cattle slaughtered in Maiduguri abattoir.

than those reported in Nguru in 1973 and 1974 (0.4 and 0.5%, respectively) (8). The present data seemed to indicate an increase in prevalence in the far north of the region. Damboa abattoir had the highest total prevalence (20%) and was the only abattoir with whole carcass condemnation (1.6%) because of TB. Aliyu and Kalra reported that 71% of the cattle with TB lesions in Maiduguri abattoir

Table II

Highest monthly prevalence of pulmonary TB cases in each year in four abattoirs located in Maiduguri, Damboa, Gashua and Damaturu

Year	Maiduguri (%)	Damboa (%)	Gashua (%)	Damaturu (%)
1994	3.7	nd ¹	nd	2.0
1995	10.2	nd	6.5	3.9
1996	4.4	20.0	8.3	4.0
1997	4.4	70.0	7.6	5.8
1998	12.0	33.3	2.2	2.8

¹ No data

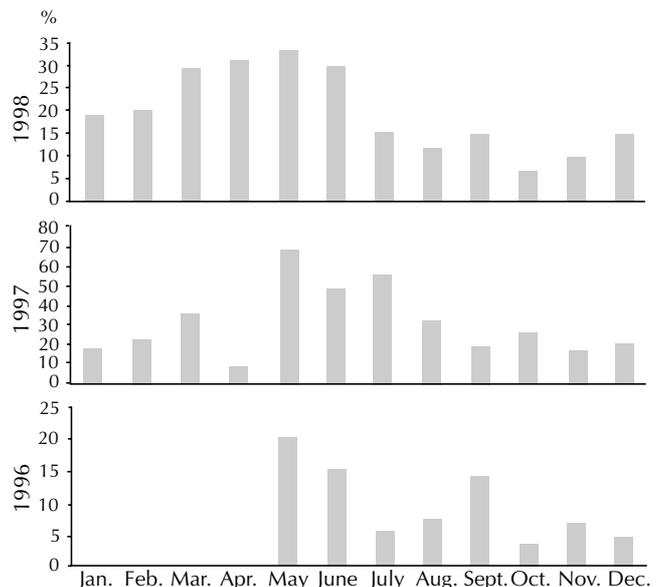


Figure 3: Monthly prevalence of pulmonary TB cases in cattle slaughtered in Damboa abattoir.

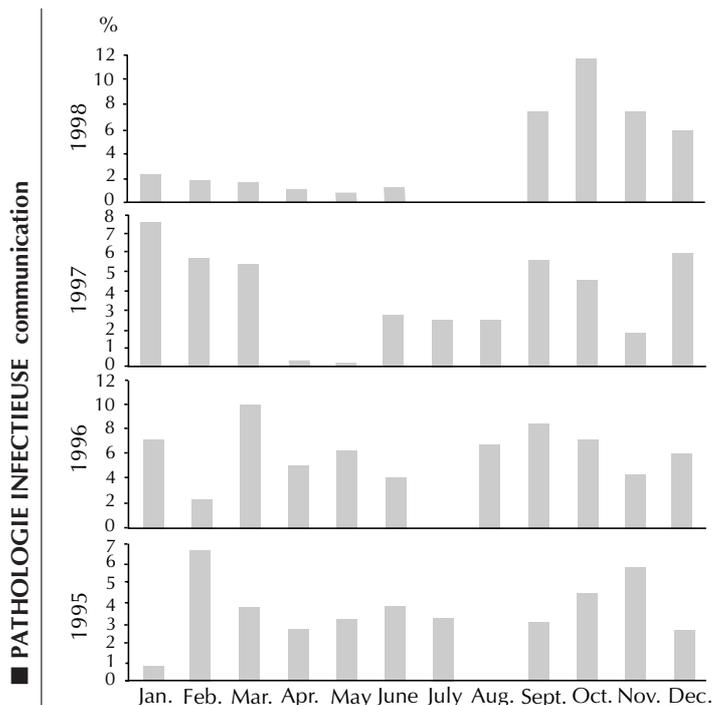


Figure 4: Monthly prevalence of pulmonary TB cases in cattle slaughtered in Gashua abattoir.

were from Damboa area (3). The factors responsible for the variations in TB prevalence among the abattoirs could not be ascertained.

The monthly prevalences illustrated the variations in the occurrence of TB cases in the various abattoirs over the yearly period. In some months, cases were not observed, whereas in other months, many cases were presented far above the usual endemic level. The sporadic increase in monthly prevalences is noteworthy in the surveillance of bovine TB in the region. It should be closely studied to understand the factors involved in this epizootiological pattern.

CONCLUSION

The abattoir data were considered good indicators of the prevalence of pulmonary bovine TB. They showed a continuous endemicity of

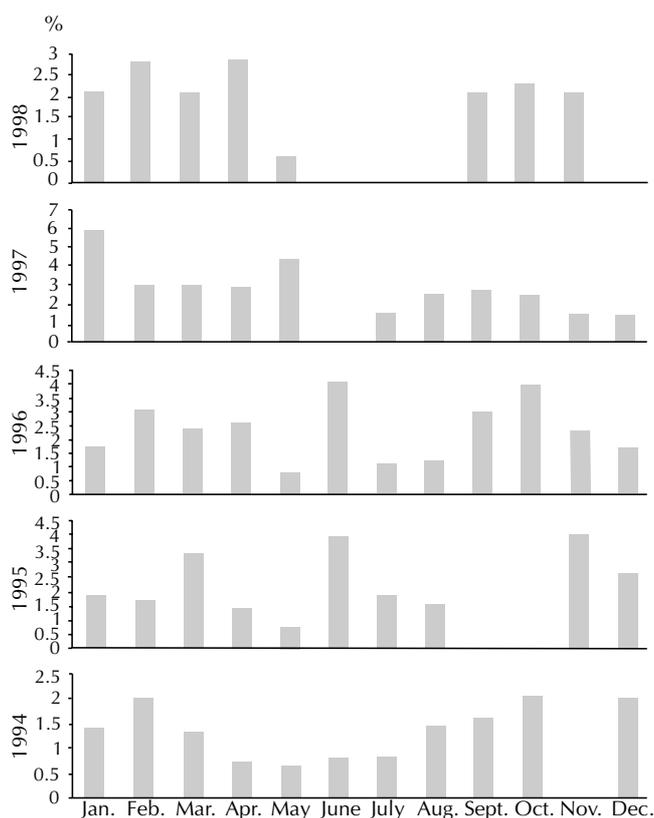


Figure 5: Monthly prevalence of pulmonary TB cases in cattle slaughtered in Damaturu abattoir.

the disease with a tendency towards epidemic proportions in some months and in Damboa area. Therefore, control measures are needed to reduce the number of bovine TB cases and to prevent the spread of the disease to human populations.

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Résumé

Igbokwe I.O., Madaki I.Y., Danburam S., Ameh J.A., Aliyu M.M., Nwosu C.O. Prévalence des lésions tuberculeuses pulmonaires chez le bétail

Une enquête sur la tuberculose chez le bétail a été réalisée dans quatre abattoirs situés à Maiduguri, Damboa, Damaturu et Gashua au nord-est du Nigeria, de 1994 à 1998. Sur un total de 1 698 000 bovins abattus examinés *post mortem*, 2,8 (intervalle de confiance de 95 p. 100 : 2,76–2,84) avaient des lésions tuberculeuses pulmonaires. La prévalence a varié de 1,9 p. 100 à l'abattoir de Damaturu à 20 p. 100 à celui de Damboa. Les prévalences annuelles durant la période de l'étude ont varié de 2,3 à 4,7 p. 100. Les prévalences mensuelles ont révélé de prévalences sporadiques élevées au-delà du seul endémique. En conclusion, il a été trouvé que la tuberculose bovine était encore endémique dans cette région et des indications ont montré qu'elle avait atteint des proportions épidémiques dans la zone de Damboa. Il est donc nécessaire que le gouvernement fédéral prenne et mette en œuvre des mesures de lutte afin de limiter la propagation de la maladie dans les cheptels bovins et sa transmission à l'homme.

Mots-clés : Bovin – Tuberculose – Abattoir – Morbidité – Nigeria.

Resumen

Igbokwe I.O., Madaki I.Y., Danburam S., Ameh J.A., Aliyu M.M., Nwosu C.O. Prevalencia de lesiones de tuberculosis pulmonar en ganado sacrificado en mataderos en el nordeste de Nigeria

Se llevó a cabo un estudio sobre la tuberculosis en ganado en cuatro mataderos localizados en Maiduguri, Damboa, Damaturu y Gashua, en el noreste de Nigeria, entre 1994 y 1998. De las 1 698 000 cabezas de ganado sacrificadas y examinadas *post-mortem*, 2,8% (95% intervalo de confianza: 2,76–2,84) presentaron lesiones de tuberculosis pulmonar. Las prevalencias variaron de 1,9% en el matadero de Damaturu a 20,0% en el matadero de Damboa. Las prevalencias anuales durante el periodo de estudio variaron entre 2,3 y 4,7%. Las prevalencias mensuales mostraron prevalencias altas esporádicas, por encima del nivel endémico. Se concluye que la TB bovina es todavía endémica en la región, con indicios de proporciones epidémicas existentes en el área de Damboa. Por lo tanto, es necesario que el gobierno federal considere e implemente medidas de control para limitar la diseminación de la enfermedad entre el ganado y la población humana.

Palabras clave: Ganado bovino – Tuberculosis – Matadero – Morbosidad – Nigeria.