

THE PREVALENCE OF BOVINE TUBERCULOSIS IN SLAUGHTERED CATTLE AT GARKI ABATTOIR F.C.T ABUJA, NIGERIA

John Alabi Bozinviya; Dr. M. B. Ardo; Dr. P. Nduva; Dr. H. Y. Aliyara; Nate J. Maikano and Dr. I, Alfa

Abstract

A survey on post-mortem inspection was conducted between April - May, 2005 in Garki abattoir F.C.T. Abuja. To determine the prevalence of bovine Tuberculosis, and to ascertain the extent of carcass/organ condemnation . (Economic losses) due to the disease. A total of 6,677 head of cattle were inspected, 3,414 and 3,263 were males and females respectively. Out of which 122 cattle were affected with 73 females and 49 males been condemned (organs). The percentage prevalence and economic losses were determined using descriptive statistics such as simple percentage, tables and data collected during inspection respectively. The percentage prevalence of the disease was 1.82% with a conservative estimate of N164,850 lost during the corresponding period. Out of this estimate the lungs and liver accounted for N151,200 and N13,650 respectively. A wide spread private (clandestine) slaughter especially during ceremonies accounted for the low estimate recorded. This percentage prevalence leading to such high economic losses is attributable to different factors ranging from low immune status of some breeds, and management practices, which predisposes the animals to any kind of infectious diseases. Recommendations on how to reduce the disease were highlighted, such as thorough ante-mortem examination, adequate farmers education on the importance of vaccination, compensation by government for condemned organs, purchase of meat and its by-products from proper meat vendors etc.

Introduction

Economic importance of any livestock disease can be thought of as the level of damage done negatively to the livestock in a given population of animals. Livestock production is an economic activity common to all states of Nigeria across the ecological and climatic zones. It forms a significant component of farming system. The success of human being on earth is attributable largely to the animals that have fed, clothed and carried them and cultivated the fields. (Campbell & Lasley, 1985).

Economic viability is the most important factor in establishing most industries. Livestock and meat industry is not left out. The Nigerian livestock industry is contributing immensely to the nation's gross domestic product (GDP), of the N50 billion project for 1985, the livestock industry accounts for N25 billion (Okubanjo, 1990).

Cattle are widely spread throughout the world where agricultural production is possible and have more even distribution than sheep and goats. Although, they are so commonly found in the extremely hostile environment. In most developed parts of the world, the main source of milk is from cattle. (Aliyara & Ayanwale, 1999).

Beside, the economic value of livestock, they play vital role in religious and social customs of many people in various countries. It is assumed that about 10% of the cattle population are slaughtered annually resulting in an estimated slaughter of 1,310,00 head of cattle in 1994 (Aliyara & Ayanwale, 1999).

Despite the enormous importance of cattle, their productions are being limited by the effect of disease. This is because different disease affects all the species of livestock and in various degrees.

Among disease affecting cattle, Bovine tuberculosis is of great economic importance in cattle rearing countries of the world. At present very little data is available on the economic and public health significance and carcass condemnation in Nigeria (Alonge & Fasanmi, 1979).

According to recent estimates, annual economic loss due to bovine tuberculosis in Nigeria is approximately 60 million US dollars (equivalent to N700,000,000) per year. Out of which loss due to carcass and offal condemnations were put at 15-30 million US dollars (approximatly 250-310 million Naira) World Health Organization (WHO, 1994).

This therefore, calls for proper information on the prevalence of bovine tuberculosis in Nigeria and hence a national control of disease and eradication programme.

Statement of the Problem

Tuberculosis is a worldwide disease of cattle and human. It is highly infectious and zoonotic in nature. Studies have revealed that, the rate of its spreading is proportional as cattle breeding is intensified (Abdulkadir, 1989).

These coupled with reports in 1993 that there are estimated 8-10 million new cases and 2-3 million death in every year (Kamale & Kachiro, 2000).

This summarises the need to tackle the disease in Nigeria so as to avoid the loss of lives (human and cattle) through infection and Economic losses due to condemnation (partial or total) of affected parts/organs. In view of the above, there is every need to ascertain the rate of prevalence of the disease today, so as to device measures of control to reduce the disease considering the remarkable contribution of cattle to man's well being. (Kamale & Kachiro, 2000).

Objectives of the Study

This research aims at

Investigating the Percentage Prevalence of bovine tuberculosis in slaughtered cattle.

To make an economic appraisal of the losses caused by the disease to the local meat industry.

Justification of the Study

There are efforts undertaken to control this disease in some parts of Nigeria, despite this, the infection rates are still been reported (Aliyara & Ayanwale, 1999).

More specifically, tuberculosis situation in slaughtered cattle in Abuja has never been under serious investigation. The results from this study will not just paint a picture of the disease in the abattoir, but the analysis of the results are expected to help and be of use to the government to adopt to a more serious posture on the epidemiology and stringent control of the disease in Abuja and Nigeria as a whole.

The study will also be a useful guide in the formation of both livestock and human health policies in the area and thus improve livestock industry.

Materials and Methods Study Area

This study was carried out at Garki abattoir situated at the Federal Capital Territory, Abuja. The Federal Capital territory is located at the geographical centre of the nation, It lies between latitudes 25-29°N and longitude 6°45'S. An average number of about 200-250 cattle are being slaughtered in the abattoir daily.

Materials that were Used for Meat Inspection

The basic materials that were used to carry out the inspection includes

A sharp knife

A meat hook

A pair of Wellington boot

A lab coat

A pair of hand glove

A knife etc.

Method of Data Collection

The data for this study was obtained by regular or daily visit to Garki abattoir in the morning for meat inspection i.e. for five weeks (1st April-4th May, 2005) before the meat is delivered for consumption.

Animals Inspected

The animals examined were cattle slaughtered at the Garki Abattoir for the periods of April and May, 2005. The inspected animals were 6,677 head of cattle comprising 3,414 males and 3,263 females of various ages respectively.

Procedure for Post Mortem Inspection

Post-mortem inspection was done according to the method described by Wilson (1991). The primary procedures involved were visual examination, palpation of meat or organ and incision into the meat or organ.

Analytical Techniques

The following methods of data analysis, descriptive statistics such as simple percentage, tables etc were used to determine the rate or degree of prevalence of the disease.

Estimation of Economic Loss Due to Carcass and Offal Condemnation

Losses were based on data collection from condemnation of carcass and organs during post-mortem inspection. It was done using this formula.

Loss due to condemnation = $C_0 + C_w$

Where C_0 - Cost of organ condemned at slaughter
 C_w = Cost of whole carcass condemned

This formula was adapted from the formula by Ogunrinade and Ogunrinade (1991) as used by (Aliyara & Ayanwale, 1999).

$E_L = N_D = (P_A \times AC) + (C_0 + C_w) + (N_c + M_c)$

Where

E_L = Estimated annual economic loss due to tuberculosis

N_D = Number of animals that died of tuberculosis

P_A - Average market price of 1kg of beef

AC = Average carcass weight of Nigerian cattle in Kg

C_0 = Mean cost of organs condemned at slaughter

C_w = Mean cost of whole carcass condemned

N_c = Loss due to chronic effect

M_c = Miscellaneous cost

Results

During the study 6,677 heads of cattle were inspected of which 3,414 and 3,263 were males and females respectively.

Table 1: Average Number of Cattle Slaughtered Per Week, Number of Animals Affected and Percentage Prevalence of Tuberculosis

| Week | Average No of slaughtered | Average No of affected | (%) Prevalence Tuberculosis |
|-------|---------------------------|------------------------|-----------------------------|
| 1 | 1,125 | 24 | 2.1 |
| 2 | 1,411 | 20 | 1.4 |
| 3 | 1,390 | 21 | 1.5 |
| 4 | 1,323 | 27 | 2.0 |
| 5 | 1,428 | 30 | 2.1 |
| Total | 6,677 | 122 | 9.1 |
| Mean | 1335.4 | 24.4 | 1.82 |

The percentage occurrence of the disease can be calculated using the formula below

$$\% \text{ occurrence} = \frac{\text{Total number of affected animals}}{\text{Total number of cattle slaughtered}} \times \frac{100}{1}$$

Discussion

Table 1 shows the average number of cattle slaughtered per week, number of animals affected and condemned and rate of tuberculosis prevalence.

During the period of the study (April - May, 2005) i.e. 5 weeks, an average of 1,335 head of cattle were slaughtered weekly at the Garki abattoir in Abuja. The data indicates that from every 1.82% of the 1,335 slaughtered cattle, there is a possibility of slaughtering a tuberculosis infected animal this rate of tuberculosis infected cattle can be classified as a high incidence. This can be explained in relation to the transmission pattern of the disease and thus its zootomic implication as herd management makes people close to the animals and there is a possibility of transmission from animal to human and vice versa. This has been reported by Halpin (1975). He stated that after almost complete eradication of bovine tuberculosis in the Netherlands, cases of new infections of cattle were traced to the excretion of *Mycobacterium bovis* by people with pulmonary or urinogenital infections.

More so, this study reveals that out of the total number of 6,677 cattle slaughtered within the period under consideration (April - May, 2005), the percentage (%) prevalence rate was 1.82%, comparing this figure with that obtained by Abdulkadir (1989) involving 14,000 cattle which shows 2.5% positive reactors, the above percentage is relatively high. But considering that without any serological test, 1.82% in slaughtered head alone is high especially because of the transmission pattern of morbidity of the disease.

Table 2: Distribution of the Condemnation of Tuberculosis Affected Organs in Relation to

Breed, Age (Years) and Sex

| | Breed | Age (Years) | Sex | | Organ Affected |
|---|----------------|---------------------------------|------|--------|-----------------------------|
| | | | Male | Female | |
| 1 | White fulani | 3-5 | 17 | 36 | Lungs |
| | “ “ | 1-2 ¹ / ₂ | 4 | - | Liver |
| 2 | Adamawa Gudali | 3-5 | 11 | 21 | Lungs |
| | “ “ | 1-2 ¹ / ₂ | 3 | - | Liver |
| 3 | Sokoto Gudali | 3-5 | 8 | 15 | Lungs |
| | “ “ | 1-2 ¹ / ₂ | 6 | 1 | Lymphnodes (mediastinal) |
| | Total | | 49 | 73 | |

(1) White fulani % infection = $\frac{\text{No of cattle affected}}{\text{Total number of animals affected}} \times 100$

$$= \frac{57}{122} \times 100 = 46.72\%$$

Males = $\frac{21}{122} \times 100 = 17.21$

Females = $\frac{36}{122} \times 100 = 29.51$

} 46.72%

(2) Adamawa Gudali

$$\frac{35}{122} \times 100 = 28.68\%$$

Males = $\frac{14}{122} \times 100 = 11.47$

Females = $\frac{21}{122} \times 100 = 17.21$

} 28.68%

(3) Sokoto Gudali

$$\frac{30}{122} \times 100 = 24.59\%$$

Males = $\frac{14}{122} \times 100 = 11.47$

Females = $\frac{16}{122} \times 100 = 13.11$

} 24.59%

Discussion

Table 2 shows the distribution of tuberculosis in different breeds of cattle. The white Fulani have been more predominantly affected with (46.72%) due to poor immune status (Abdulkadir, 1989) followed by the Adamawa Gudali (28.68%) and the least affected being Sokoto gudali (24.59%). This distribution of the infection could be related to the management pattern which predisposes the animals to any kind of infectious disease, the cattle are reared by the traditional rural farmers (Mainly the nomads) who are less interested in improved management, this in relation lo climate of the area which they are brought up favours the build-up of various lung parasites and diseases

The affected breed of cattle shown in Table.2 involves 73 females and 49 males, which falls into the age bracket of 3-5 years. This shows that females are mostly affected. This can partly be attributed to the fact that tuberculosis general signs becomes more pronounced after calving, with advance in age associated loss in youth vigour, the resistance to the disease is lowered and the animal becoming more vulnerable. The males seem not to be affected much by the disease. This can be explained partly due to the care given to them by the farmers as to constitute the principal course of breeding stocks as well as income where dairy products are not well exploited. Also most of the bulls or steer reach the slaughterhouse after some separate management under feedlot.

Loss Due to Condemnation

The Economic loss to condemnation is assessed using the formula by Ogunrinade and Ogunrinade as adopted by Aliyara and Ayanwale (1999) EL = Estimated economic loss due to tuberculosis NO = Number of animals that died of tuberculosis PA = Average market price of 1kg of beef B_w = Average carcass weight of Nigerian cattle in kg C/v = Mean cost of whole carcass condemned Co = Mean cost of organs condemned at slaughter N_c = Loss due to chronic effect

From the survey conducted in the abattoir and GarkJ market at the time of this research, the unit cost price of

whole lungs organ and liver was N1400 and N1950 respectively. Therefore loss due to total condemnation of lungs

$$= C_Q + C_W$$

$$C_Q = 108 \times 1,400 = N151,200 \quad C_W = NU$$

Loss due to condemnation of lungs

N151,200

Loss due to total condemnation of liver

$$= C_o + C_w \text{ Where}$$

$$C_o = 7 \times 1,950.00 = N13,650.00 \quad C_w =$$

Nil :

Loss due to condemnation of liver = N13,650.00 Total loss due to lungs

and liver condemnation

$$= 151,200 + 13,650$$

$$= N164,850 \quad \dots\dots\dots$$

$$\text{Since } N_D = \text{Nil}, N_D (P_A \times B_w) = 0$$

$N_c = \text{Nil}$, and there are no miscellaneous cost encountered Economic losses due to tuberculosis infection is = N164,850.00 Therefore, total loss due to condemnation in cattle infected with tuberculosis at the abattoir is one hundred and sixty four thousand eight hundred and fifty naira only.

From the results of the computations, the economic loss was one hundred and sixty four thousand eight hundred and fifty naira only, lost during the corresponding period April - May, 2005 in Garki Abattior, Abuja.

During the period of the study 108 bovine lungs worth N151, 200.00. were condemned and 7 bovine livers worth N13,650.00 were also condemned, this together amounted to N164,850.00 only from the condemnation of lungs and liver. Investigation revealed that some butchers do clandestine slaughters especially when the animal is seriously affected by a particular disease. This may partly be the reason for the reduction in estimate or loss recorded.

According to Radostits et al (1997) and Abdulkadir (1989), that apart from the direct losses, it is estimated that infected animal loss 10-25% of their productive efficiency when in contact with the disease.

Conclusion

This study obviously is an under estimation of the actual loss due to condemnations during post mortem inspection in the abattoir. This was because many cattle were slaughtered at private homes and other unauthorised slaughter slabs without veterinary inspection and all these were not included in the study.

Despite all these inadequacies, the loss as much as one hundred and sixty four thousand eight hundred and fifty naira (N164,850.00) within 5 weeks from an abattoir is a big waste especially when we consider the fact that what was found out in this study is a representation of what is happening nation-wide.

Finally the high incidence of the disease, therefore represents the sample of cattle population in one of the slaughter houses in the Federal Capital Tertiary (FCT) and since most of the cattle slaughtered are brought from various states of the federation, especially from the North, the results therefore are a reflection of the prevalence of the disease nationwide. Therefore, I believe that the losses incurred can be significantly reduced if the following recommendations are adhered to:

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