

SEROPREVALENCE OF BRUCELLOSIS IN GOATS IN THREE DISTRICTS OF PANKSHIN LOCAL GOVERNMENT AREA OF PLATEAU STATE, NIGERIA

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ABSTRACT

This study was conducted to determine the seroprevalence of brucellosis in goats in three districts of Pankshin Local Government Area of Plateau state, Nigeria. The three districts were Fier, Wokkos and Chip and in each district 3 villages were randomly selected. A total of 270 of blood samples were collected using a systematic sampling method, 90 samples from each district and 30 samples in each village. Samples were carefully labelled by location, sex and age. The samples were sent to the Bacteriology laboratory of National Veterinary Research Institute (NVRI) Vom and subjected to Rose Bengal Plate Test (RBPT) to identify the *Brucella* antigen. One-sample T-test statistics was used to analyze the data collected. Of the total 270 samples, the percentage of positive (11.85±1.45%) was significantly ($p<0.05$) lower than negative (88.15±1.45%). With regards to sex, the percentage of positive females (7.67±0.88 %) was significantly higher than males (3.00±0.58 %) while with regards to age, the percentage of positive goats from above 12 months old (8.67±1.45%) was significantly ($p<0.05$) higher than from 0-12 months old (2.00±1.16%). It may be concluded that brucellosis is present in the three districts of Pankshin Local Government Area of Plateau State, Nigeria. Therefore, preventive and control measures such as quarantine, controlled mating, vaccination and regular treatments with antibiotics are recommended.

Keywords: Age, brucellosis, goat, location, sex.

INTRODUCTION

Brucellosis is one of the tropical zoonotic diseases caused by *Brucella* species (Zubairu, 2014). The reports of the WHO (2009) showed that *B. melitensis* and *B. abortus* are the most important species causing high morbidity and mortality in goats worldwide. The devastating economic and public health impacts of brucellosis include infertility, abortion, decreased kidding rate, decreased milk yield, still births, birth of weakly neonates, and loss of man hours (in humans) to cost of treatment (Adugba *et al.*, 2013; Smirnova *et al.*, 2013; Zubairu, 2014). Animals contract this disease by grazing on contaminated pastures, breeding with infected partners, overcrowding, dams to kids transmission by suckling, **INTRODUCTION** of infected animal into a herd, among others factors (Junaidu, 2012; Adugba *et al.*, 2013). Several researches to determine the prevalence of brucellosis have been conducted in many parts of Nigeria, but such studies have not been well documented in the area under depiction. Therefore, the objective of this study was to determine the seroprevalence of brucellosis in goats in three districts of Pankshin Local Government Area of Plateau state, Nigeria.

MATERIALS AND METHODS

This study was conducted in Pankshin LGA of Plateau State Nigeria. Pankshin LGA is located in the Central Zone of Plateau state it is well known for its relatively cool temperature with an average annual temperature of 22°C (Shiru, 2018).

In each District three (3) towns were randomly selected and in each town, houses that have goats were identified and serially labelled. Thereafter, samples were collected from 15 houses using a systematic sampling method i.e. in a village of 45 houses, houses with series numbers 3, 6, 9, 12, 15,, 39, 42 and 45 were used; after that, male and female were randomly selected in each house. A total of 270 samples were collected (30 per village and 90 per district). Blood sample of 5 ml was collected from each goat through jugular puncture using 10 ml syringe and 21G needle. Each sample was labelled base on location, sex and age. Two age groups were used, from 1-12 months old and from above 12 months old. Thereafter, the

samples were immediately transported in ice pack to the Bacteriology laboratory of National Veterinary Research Institute (NVRI) Vom. Sera were screened for antibodies against natural *Brucella* infection using Rose Bengal Plate-agglutination test (RBPT) using standard protocol of OIE (2018). The results were appreciated by examining the degree of agglutination and any visible agglutination was considered as positive while an absence as negative.

Data generated was analysed using one-sample T-test statistics.

Results

Table 1 shows the seroprevalence of brucellosis in experimental goats by districts. The percentage positive goats ($11.85 \pm 1.45\%$) among the districts was significantly ($p < 0.05$) lower than negative ($88.15 \pm 1.45\%$).

Table 1: Seroprevalence of Brucellosis in experimental goats in the 3 districts

Parameters (%)	Mean $\pm$ SEM
Positive	11.85 ± 1.45^b
Negative	88.15 ± 1.45^a
Level of significance	*

Values are mean $\pm$ SEM of 3 districts,

Means in the row with different superscripts differed significantly, * significantly ($P < 0.05$).

Table 2 shows seroprevalence of brucellosis in experimental goats in the 3 districts by sex. The percentages of positive males and females (3.00 ± 0.58 and $7.67 \pm 0.88\%$, respectively) among the districts were significantly ($p < 0.05$) lower than negative (46.00 ± 0.58 and $43.33 \pm 0.88\%$, respectively) and the percentage of positive females ($7.67 \pm 0.88\%$) was significantly ($p < 0.05\%$) higher males ($3.00 \pm 0.58\%$).

Table 2: Seroprevalence of Brucellosis in experimental goats in the 3 districts by sex

Parameters (%)	Mean $\pm$ SEM
Males	
Positive	3.00 ± 0.58^c
Negative	46.00 ± 0.58^a
Females	
Positive	7.67 ± 0.88^b
Negative	43.33 ± 0.88^a
Level of significance	*

Values are Mean $\pm$ SEM of 3 districts,

Means in the row with different superscripts differed significantly, * significantly ($P < 0.05$).

Table 3 shows the seroprevalence of brucellosis in experimental goats in the 3 districts by age. The percentages of positive goats from 1-12 months old and above 12 months old (2.00 ± 1.16 and $8.67 \pm 1.45\%$, respectively) among the districts were significantly ($p < 0.05$) lower than negative (22.66 ± 1.76 and $66.67 \pm 1.20\%$, respectively); and the percentage of positive adults ($8.67 \pm 1.45\%$) was significantly ($p < 0.05\%$) higher the young ($2.00 \pm 1.16\%$).

Table 3: Seroprevalence of brucellosis in experimental goats in the 3 districts by age

Age		Mean $\pm$ SEM
0-12 months	Positive	2.00 ± 1.16
	Negative	22.66 ± 1.76
Above 12 month	Positive	8.67 ± 1.45
	Negative	66.67 ± 1.20
Level of significance		*

Values are mean $\pm$ SEM of 3 districts,

Means in the row with different superscripts differed significantly, * significantly ($P < 0.05$).

Discussion

A disease case, no matter how mild, cannot be over looked particularly when dealing with infectious type like brucellosis that can be transmitted from infected to non-infected animals and also from animals to human beings. The observation of positive *Brucella* spp in the samples collected is an indication that brucellosis is prevalence in the three districts of Pankshin LGA. This may in part be due to the traditional system of management in which animals of different backgrounds grazed together in a field and usually indiscriminate mating cannot be controlled. The 11.85% of positive goats in this study is higher than 10.35% by Alhaji and Wungak (2013) in North-central Nigeria, 5.82% by Cadmus *et al.* (2013) in Ibadan, 6% by Cadmus *et al.* (2010) in Ibadan, 2.83% reported by and Ogugua *et al.* (2014) in selected states in Nigeria. However, it is lower than 18.2% reported by Ojo, (2013) and 27.7% by Kaltungo *et al.* (2013). The differences in the incidence might be due to environmental differences and also may be due to the testing method used (i.e. ELISA vs. RBPT etc). The higher significant ($p < 0.05$) percentage of positive females observed in this study than males indicates that the females have more chances of contracting brucellosis than males. This is in agreement with the reports of Adugba *et al.* (2013) and Smirnova *et al.* (2013) that females contracted brucellosis more than males. Adugba *et al.* (2013) argued that females are prone to this infection because most farmers do keep many female for breeding purpose than males. In regards to age, the percentage of adult ones (ages 12 and above) was higher than those ages from 1-12 months old. This result is supported with the finding of Junaidu (2012). Junaidu (2012) attributed the higher incidence in adults due to their longer exposure to the predispose factors such as longer grazing on contaminated pastures and indiscriminate mating while Adugba *et al.* (2013) opined that younger animals may contract brucellosis through suckling infected mothers.

CONCLUSION

The study revealed that brucellosis may be endemic in the three districts in Pankshin LGA. Females were observed to be infected more than males and the disease is found more in older goats than younger ones. Therefore, meaningful strategy control measures are recommended to reduce or eradicate this disease.

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