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SEROPREVALENCE OF MYCOBACTERIUM BOVIS INFECTION IN SOME SELECTED DAIRY HERDS IN KANO STATE

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ABSTRACT
Immunochromatography assay (Lateral flow assay) was used to detect cattle infected with Mycobacterium bovis in 183 apparently healthy cattleselected from five dairy herds in Kano State. The overall results showed 3.8% positive and 96.8% negative reactors. Based on breed, Sokoto Gudali presents a prevalence of 7.9% while Crosses had 4.6%. There were no positive reactors among Bunaji and Frisian breeds. Prevalence based on age showed cattle between 1- 3.5years had 1.7% (1), those between 3.5-6 years had a prevalence of 5% (3) and those from 6 years and above had a prevalence of 6.1% (4). In conclusion M. bovis infection was detected using the lateral flow assay. It is hereby recommended that dairy herds should be routinely tested against M. bovis infection inorder to minimize spread of the infection in herds and also to reduce the risk of humantransmission.
Key words: Immunochromatography Assay, Cattle, Breeds, M. bovis, Kano State

INTRODUCTION
Tuberculosis is a chronic contagious disease of both animals and humans (Radostits, 2000). The disease is caused by members of the Mycobacterium tuberculosis complex (Van Soolingen *et al.,* 1997). The disease is characterized by the formation of granulomas in tissues and organs, more significantly in the lungs, lymph nodes, intestines, liver and kidneys (Shitaye *et al*., 2007). *Mycobacterium bovis* has the widest host range among all *Mycobacterium* species (Cosivi *et al*., 1998). Cattle, goats and pigs are most susceptible to *M. bovis,* with sheep and horses showing a higher level of natural resistance (Thoen *et al.,* 2006). The existence of natural reservoir hosts and asymptomatic carriers contributes to the persistence of this disease in the environment. There are various diagnostic tests for M. bovis infection in cattle (Adams, 2001). Clinical signs are of limited value in establishing a presumptive diagnosis of TB in animals. Skin testing has been used widely as ante-mortem diagnostic tool in captive and free-ranging cloven-hoofed animals (Radostits., 2000). In vitro techniques include; Cellular techniques (Lymphocyte proliferation assays), serological tests and histopathological examinations of tissues (Gormley*et al*., 2006).This study was carried out inorder to determine the prevalence of M.bovis infection using a lateral flow assay and also to suggest strategies for control and prevention of the disease.

MATERIALS AND METHODS
The study was carried out in Kano State which lies between latitude 11° 30' 0 N and longitude 8° 30' 0E. Herd selection was done based on owners' interest and consent and cattle older than 6 month of age and above were selected using systematic random sampling technique. A total of 183 cattle were sampled from five herds kept under intensive management system. The ImmunochromatographyAssay Test (Lateral flow assay) is an antigen rapid bovine TB Test Kit obtained from Animal Genetics, Inc., 3uwon-si,Kyonggi, South Korea. The test kit was stored at 4°C and used as per manufacturer's instruction. Briefly, the test kit was brought out from the foil pouch and placed on a flat, dry surface at room temperature and labeled. Four drops of serum were slowly added to the sample hole with specimen dropper. If the migration has not appeared after one minute, one more drop of the specimen was added to the sample hole. The test result was interpreted according to the manufacturer directives within twenty (20) minutes. Presence of two purple colour bands (T band and C band) within the result window, indicate positive reaction while presence of only one purple colour band (C band) within the result window, indicate negative reaction.
Statistical analysis: The data obtained was entered into minitab statistical software. Analysis was done using descriptive statistics to determine the prevalence based on breed and age.

RESULTS

Of the 183 cattle tested 3.8% (7) were positive and 96.2% (176) were classified as negative. Among the four breeds tested the following results were obtained 0 % (0/41)7.9% (5/63), 4.6% (3/65) and 0% (0/14) in Bunaji, Sokoto Gudali, Crosses and Frisian breeds respectively. Among the different age groups 1-3.5 years, 3.5-6 years and above 6 years the following was recorded 1.72% (1/58), 4.5% (3/60) and 6.1% (4/65) respectively (Table 1).

Table 1: Prevalence of M bovis infection in dairy herds using Lateral flow assay based on Age and Breed

Variable/Assay	Number tested	Number positive	Prevalence (%)
Lateral flow assay	183	7	3.8
Age			
1-3.5 years	58	1	1.72
3.5-6 years	60	3	5
> 6years	65	4	6.1
Breed			
Bunaji	41	0	0
Sokoto Gudali	63	5	7.9
Cross	65	3	4.6
Frisian	14	0	0

DISCUSSION

Immunochromatography using MPB70 protein showed 3.8% positive reactors. Previous studies have demonstrated relatively lower sensitivity for MPB70 but more specificity as compared with PPD which contains mixture of antigens and couple with the problem of false positive results (Fifis*et al,* 1992). The result obtained from this study is lower than 8.2% recordedby Inuwa, (2014) in Kano State using tuberculin test (PPD). The drop in the prevalence could be attributed to the ability of the lateral flow assay to reduce the number of false positive results due to tuberculin test. The results also showed Bunaji and Frisians were free of M bovis infection, the difference in prevalence between Bunaji, Sokoto Gudali, Cross (Friesian/Bunaji) and Friesian/Sokoto Gudali) and exotic (Friesian) breeds was significant and is in agreement with Alhaji, (1976) and Radostits *et al., (*2000) but disagreed with Salisu, (2007). Similar result was reported that genetically improved cattle might suffer more severely from malnutrition and poor housing systems in tropical countries and consequently become more susceptible to infection (Kiros, 1998).

The study has also demonstrated the effect of age on the prevalence of M. bovis infection as reflected by lateral assay test results and is significant. The proportion of positive reactors increased with ages which indicated an increased incidence of the infection with increase in age and this is in agreement with Abubakar (2007), Shehu (1988) and Munroe (2000). Tuberculosis is a chronic disease, the longer the animal lives, the higher the chance of infection (Benkirane, A, 1998)

CONCLUSIONS

In conclusion M. bovis infection was detected in the dairy herds using lateral flow assay

RECOMMENDATION

It is hereby recommended that there is the need to use lateral flow assay alongside with the tuberculin skin test in screening dairy herds against *M. bovis* infection

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