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ASSESSMENT OF FARMER'S KNOWLEDGE, ATTITUDES AND PRACTICES ON FOOT AND MOUTH DISEASE VIRUS AMONG SMALL RUMINANTS IN MIXED LIVESTOCK SYSTEMS IN GOMBE STATE, NIGERIA

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ABSTRACT

The study was a cross-sectional and survey-based risk assessment. to assess farmer's knowledge, attitudes and practices on foot and mouth disease virus among small ruminants in mixed livestock systems in Gombe state, Nigeria The study population included animals: Sheep and goats in mixed herds with cattle and humans: Farmers and livestock handlers in Gombe state. A multistage cluster sampling was employed to select sampling units. A semi-structured closed ended questionnaire was developed and administered to the herders immediately after sample collection. These questions were deployed via KoBoToolbox, using the KoBoCollect mobile app on Android phones, to enable both offline data collection and online data submission by trained field assistants. The Demographic characteristics of the respondents the study showed that majority of the respondents 38.9% were above 30 years of age and only about 2.9% of the respondence were above 60 years of age, majority 82.2% of the respondents were male and only 17.2% female, 30.9% respondents have no formal education, 64.4% of the respondents claimed farming as their occupation and majority 66.9% of the respondence were Fulani, 14.2% Hausa and 18.9% other tribes .About 52.7% have very good knowledge of FMD in small ruminants, 66.1% and 69% of the respondents exhibit attitudes and practices that increase the risk to FMDV infection. In conclusion, more than half of the respondents have good knowledge on FMD in small ruminant, but exhibit attitudes and practices that increase the risk of FMD in Gombe State. Movement-control measures and public education on FMD were recommended in the prevention and control of FMD

Keywords: FMD, Epithelium, Knowledge, Attitudes, Practices, Nigeria.

1.0 INTRODUCTION

Ruminant production has been recognised for its contribution to livestock production in Nigeria. Ruminants form a significant proportion of the livestock production in Nigeria and possess obvious advantage over other livestock such as playing significant roles in the life of rural households (Aruwayo, *et al.,* 2015).

Small ruminants (sheep and goats) are sometimes preferred by farmers compared to large ruminants because of the small space they occupy and less fodder requirement. Small ruminant production has been described as one of the fastest growing agricultural subsectors in developing countries. Its share of agricultural gross domestic product (GDP) has been reported as 33% and is rapidly increasing (Delqado, 2005; Thornton, 2010). In addition, goats have high adaptability to harsh climates which makes them suitable for husbandry in marginal areas (Kosgey, *et al.*, 2008; Wanyoike, 2009). They are veritable sources of income generation, household consumption, and hobby and as security against crop failure. Lebbie (2004) reported that sheep and goats play a significant role in the food chain and overall livelihoods of rural households, where they are largely the property of women and their children. Rearing of SR plays a very important role in the lives of households in developing countries.

In Nigeria, the role of SR farming in poverty alleviation for the common people cannot be overemphasized; it has become an integral part of the socio-economic life of most rural dwellers. SR production is an immense benefit to livestock farmers in the areas of meat and milk production, hides and skin, manure income generation, cultural and religious ceremonies and festivals, they also serve as a source of ready cash to small farmers in emergency situation (Al-khaz'leh *et al.*, 2005; Nwachukwu and Berenidu, 2020). Other advantages include lack of social and religious barrier to its production and consumption (Yusuf *et al.*, 2018). Infectious diseases are the major constraints in SR production (Nyariki and Amwata, 2019).

Foot and mouth disease (FMD) is an acute highly contagious, transboundary, disease caused by foot and mouth disease virus (FMDV). It affects cloven-hoofed domestic ruminants such as cattle, swine, sheep and goats as well as cloven-hoofed wild ruminants (Arzt *et al.*, 2011). It severely affects livestock production leading to disruption of trade in animals and their products at regional and international level. A global strategy for the control of FMD was endorsed in 2012 to minimize the burden of FMD in endemic settings and maintain free status in FMD-free countries (OIE, 2018). About 77% of the global livestock population is affected by the disease, mainly in Africa, the Middle East and Asia, and some few areas in South America (OIE, 2018). This is coupled with the possibility of disease incursion in countries which are currently free (OIE, 2018).

FMD is widely distributed in the developing world, in particular Africa, Asia, Middle East and South America, where livestock farming forms the backbone of rural economies that supports approximately 70% of the world's poor (Maree *et al.*, 2014). FMD outbreaks particularly

affects vulnerable individuals such as women and children in rural areas since approximately 75% of livestock in Africa are raised under the pastoral systems for sustainable livelihoods (Scoones *et al.*, 2010; Ferguson *et al.*, 2013; Miguel *et al.*, 2013). The lack of veterinary infrastructure, human resources, movement controls, and appropriate vaccines render many developing countries particularly exposed to the spread of FMD (Doel, 2003; Sutmoller *et al.*, 2003; Perry and Rich, 2007). In sub-Saharan Africa, two transmission cycles of FMD occur: one in which FMDV circulates between wildlife and domestic animals and the other in which the virus spreads among domestic animals. The cycle between wildlife and domestic animals occurs in southern and eastern Africa, but due to the low populations of wildlife in West Africa, the disease is maintained mainly in domestic animals (Fasina *et al.*, 2013). Sheep and goats form a substantial proportion of the global FMD-susceptible livestock population. However, these species have not been studied with regard to their epidemiological role and significance in the spread of FMD. Unlike cattle, sheep and goats are not included in vaccination control programs in Study area. In spite of their potential infection, though all species are subject to the normal quarantine measures in disease outbreak. Thus, the present study was to assess farmer's knowledge, attitudes and practices on foot and mouth disease virus among small ruminants in mixed livestock systems in Gombe state, Nigeria

2.0 MATERIALS AND METHOD

2.1 Study area

The study was conducted in Gombe State, Nigeria. It is located on longitude 11° 10‘ E and latitude 10° 15´ and situated in the north eastern part of Nigeria. Being located within the expansive savannah allows the state to share common borders with the states of Borno, Yobe, Taraba, Adamawa and Bauchi. Gombe State has an area of 20,265 km^2 and a population of about 2,353,879 million people (NPC, 2006). Gombe state has two distinct climates, the dry season (November – March) and the rainy season (April – October) with an average rainfall received of 850mm/annum. Administratively the state is made up of 11 local Government Areas and 14 traditional chiefdoms (GSG, 2013). The state has an estimated cattle population density of 1 million and 2.5 million small ruminants (GSBS, 2018). The savannah vegetation as well as the present of Dadin-kowa dam, Cham dam, Balanga dam and Wawa Zange grazing reserve makes the state suitable for livestock rearing. The state comprises of different ethenic

groups which include Fuifulde, Tera, Tangale, Babur, Kanuri, Waja, Hausa, Bolewa, Jukun, Cham, Tula, Dadiya, Pero, Lunguda, Awak and Kamo.

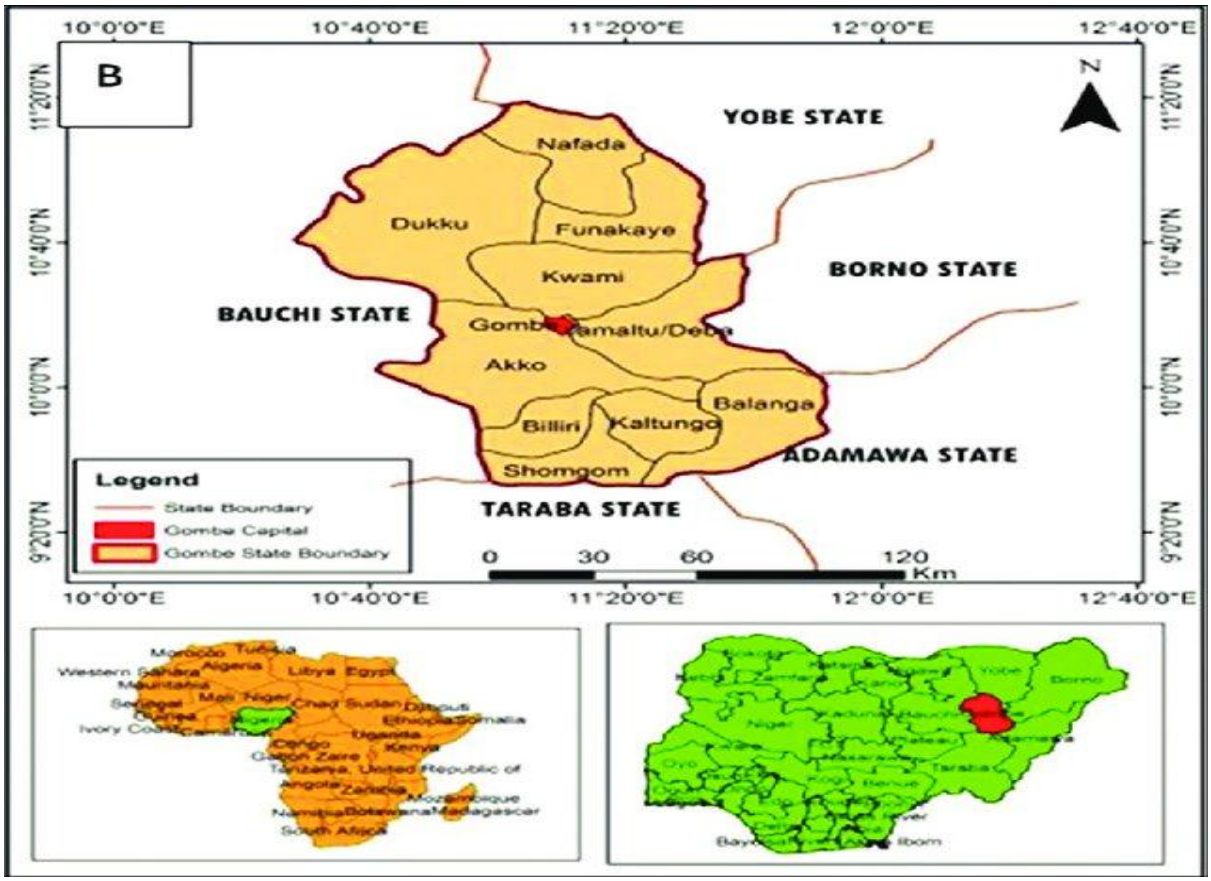

Figure 1. Map of Gombe State showing the study area (Source: Adamu and Saidu 2015)

2.2 Study Design

The study was a cross-sectional study, , and survey-based risk assessment. The study population included animals: Sheep and goats in mixed herds with cattle and humans: Farmers and livestock handlers of the Gombe region. A multistage cluster sampling was employed to select sampling units.

A semi-structured closed ended questionnaire was developed and administered to the herders immediately after sample collection. These questions were deployed via KoBoToolbox, using the KoBoCollect mobile app on Android phones, to enable both offline data collection and online data submission (Lakshminarasimhappa, 2021) by trained field assistants.

2.3 Data Analysis

Both data sets were then brought together in a Microsoft Excel Spreadsheet, cleaned and coded before being exported to Statistical Package for Social Science (SPSS) Version 20 for analysis. Analysis included descriptive analysis of the variables to generate means, medians, proportions and confidence intervals. Chi-squared test as recommended by Campbell (2007) and Richardson (2011) was used to compare proportions while the confidence intervals of the proportions was calculated using the method recommended by Altman *et al.* (2000). The test of crude association between risk factors (both individual animal and herd level) and FMD sero-positivity was done using chi-square test.

3.0 RESULTS AND DISCUSSION

3.1 Demographic Characteristics of the respondennts

The result of demographic characteristics of the respondence on Foot and Mouth Diseases (FMD) in Gombe state show that out of 275 respondence, majority of the respondence 38.9% (n = 107) were within the age of 31 – 40. only 2.9% (n = 8) fall within the old age of 61 and above. Majority of the respondence 82.2% (n = 226) were males and 17.8% (n = 49) were females.

On the bases of educational background most of the respondence 30.9% (n = 85) have Non formal education (Qur'anic education) and Primary education constituted 18.2% (n = 50). Farmers 64.4% (n = 177) were the majority of the respondence on the bases of occupation, House wife 12.0% (n = 33), Graziers 10.5% (n = 29) and people that have other business constituted 13.1% (n = 36).

Majority of the respondence 66.9% (n = 184) were Fulani by tribe and Hausa constituted 14.2% (n = 39) of the total respondence. (Table 1).

Table 1: Demographic Characteristics of the Respondents on FMD in Gombe (n = 275)

S/N	Characteristics	Categories	No (%)
1	Age	18 and Below	27 (9.8)
		19 – 30	101 (36.7)
		31 – 45	107 (38.9)
		46 – 60	32 (11.6)
		61 and above	8 (2.9)
2	Sex	Male	226 (82.2)
		Female	49 (17.8)
3	Level of Education	Qur'anic	85 (30.9)
		Primary	50 (18.2)
		Secondary	75 (27.3)
		Higher	65 (23.7)
4	Occupation	Farming	177 (64.4)
		Grazier	29 (10.5)
		House wife	33 (12.0)
		Any other	36 (13.1)
5	Tribe	Fulani	184 (66.9)
		Hausa	39 (14.2)
		Any other	52 (18.9)

3.2 Overall Scores for Knowledge, Attitude and Practice Toward Food and Mouth Diseases Amongst Animal Owners in Gombe State

The scoring was categorized into three, 0 – 39% score was considered as poor, 40 – 59% was considered as good and 60% and above was considered as very good. The result for knowledge of the respondents shows that 64.5% have the knowledge of FMD in small ruminant, 73.86% have very good attitude toward the risk of FMD and 69.9% have a good practice toward FMD in Gombe State (Table 2)

Table 4.23: Scoring Result for the Assessment of Knowledge, Attitude and Practices toward FMD in Gombe

Parameters	Category	Number, n (%)
Knowledge	Poor (0 – 39%)	317 (24.05)
	Good (40 – 59%)	1864 (51.81)
	Very Good (60 and above)	381 (65.24)
Attitude	Poor (0 – 39%)	2 (25.0)
	Good (40 – 59%)	873 (54.80)
	Very Good (60 and above)	2113 (73.86)
Practices	Poor (0 – 39%)	216 (19.64)
	Good (40 – 59%)	321 (40.18)
	Very Good (60 and above)	2531 (69.90)

3.3 Discusion

The result showed that majority of the respondents 38.9% were above 30 years of age. And only about 2.9% of the respondents were above 60 years of age. This result is in line with the findings of Mahmud (2011), who reported that none of the respondents was below 30 years of age in a study conducted on medicinal plants used in livestock ailment in Toro, Bauchi State, Nigeria.

The result also reveals that majority (82.2%) of the respondents were male and only 17.2% female. This may be due to the fact that Fulani nomadic pastoralists marry at tender age because marriage is a respected institution in the culture of the Fulani nomadic pastoralists. According

to Yisa (2013), marriage bestows social status on people, brings recognition and makes individuals to be considered as responsible.

The study showed that majority of the respondents 30.9% respondents have no formal education, it can be seen that there is high level of informal education among the herdsmen. This may not affect their knowledge on FMD control methods as most of educated herders preferred using modern methods of livestock treatment (Ibrahim *et al.*, 2015). Usman (2010) opined that western education brings enlightenment and exposure to different sources of information on modern veterinary medicine and also tend to transform herders' management practices to modern one.The result reveal that about 64.4% of the respondence claimed farming as their occupation. This may be because almost all Fulani herders engaged in farming activity and both plant production and animal rearing are known as farming that is why most of the respondence claimed to be farmers. And about 13.1% of the respondence engaged in other business. Majority 66.9% of the respondence were Fulani, 14.2% Hausa and 18.9% other tribe (Table 4.9). This shows that other people that were not herders also keep animals as a business.

On the results of Knowledge, Attitude and Practices about 52.7% have very good knowledge of FMD in small ruminants, 66.1% have very good attitude toward willingness to participate in any training on FMD and 69.0% of the respondence are very good in practicing activities that can risk the animal toward FMD infection. This result shows that respondents are highly experienced in ruminants herding. Experience brings more knowledge and specialization that increased herders' rationality in the use (acceptance) or rejection of a method or technology (Ibrahim *et al.*, 2015). According to Ogunbameru (2001), consistency and continuity in the use of technology by farmers is a reflection of the level of acceptance of that technology.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

. In conclusion, more than half of the respondents have good knowledge on FMD in small ruminant, but exhibit attitudes and practices that increase the risk of FMD in Gombe State

4.2 Recommendations.

i Movement-control measures should be put in place

ii Public education on FMD in the prevention and control of FMD

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