

## **Assessments of the Relationship between Socio-Economic Characteristics of Nomadic Cattle Fulanis and the Use of Indigenous Control Methods of Helminthosis in Cattle in Adamawa State, Nigeria**

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**Abstract:** The research analyzed the socio-economic characteristics of the Nomadic Cattle fulanis and their relationship with use of indigenous control methods of Helminthosis in Cattle, in Adamawa State, Nigeria. Primary data were collected by the use of semi-structured questionnaire administered to randomly select 363 respondents. Data collected were analyzed using percentages, frequency distribution and regression analysis. The study revealed that 75.5% had informal education, all (100%) of the respondents are above 30 years of age and about 97% were married. All (100%) of the respondents used indigenous herbs to control Helminthosis in their herds and 98.9% employs conventional drugs and vaccines in the treatment of the disease. Twelve different herbs, such as *Cissampelos owariensis*, *Balanites aegyptiaca* and *Khaya senegalensis* were found to be in use by the respondents. Significant relationships were recorded between age, marital status and years of experience with the use of indigenous control methods of helminthosis. Indiscriminate felling of trees and concealment of knowledge were among the constraints that inhibit utilization of the control methods. It is concluded that indigenous methods of helminthosis control had become part and parcel of the respondents and it is rational and easy for herdsmen to practice on their herds. It is recommended that laws banning bush burning and indiscriminate tree felling be re-enforced in order to preserve indigenous herbs to avert possible extinction. There is a greater need for change agents responsibly and other related services to be strengthened so as to incorporate the indigenous methods used by the herders.

**Keywords** Assessment, Indigenous, Socio-economic, Characteristics, Cattle, Helminthosis, Nomadic

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### **INTRODUCTION**

Livestock production is one of the farming enterprise being practiced in both the developed and developing countries. In Africa, particularly Nigeria, and especially the rural areas, livestock farming is a major occupation to the majority of the farmers living in the rural areas of the country. Animals such as cattle, goat, sheep, pigs etc are often being solitarily or in combination. The animals are also reared for different purposes based on the preference of the farmers. Some are rearing for commercial purpose, others for meat with some for traditional use among others. Cattle production is a source of employment and livelihood to many people in Nigeria. A large percentage of the rural people of this country satisfy their subsistence needs through cattle production. As reported by Ikhatua [1] cattle is the most prominent amongst all the animals being domesticated in Nigeria.

They provide continuous sources of essential food products – meat, milk, hide and skin as well as other dairy products throughout the year. It sustains the employment and income of millions of people in rural areas and generates animal power and organic manure

for arable farming mainly in the sudano-sahalian ecological zones of the country. The sale of cattle and its products provides the major source of cash income to the nomadic fulani pastoralists. In addition, among the Nomadic Fulani and Shuwa Arab pastoralists, livestock also serves as an index of social prestige [2].

Despite the importance of cattle to the development of Nigeria's economy, the industry is saddled by many problems that make it to be operating at half the capacity it is supposed to operate [3]. Among the problems faced are diseases and parasites such as foot and mouth disease, diarrhea, contagious bovine Pleuropneumonia, ticks and Helminthosis [4]. Helminthosis has long been recognized as a major constraint to the productivity of ruminants and other livestock in Nigeria and elsewhere, and has been the cause of serious economic losses [6]. The significance of helminths has been recognized by local people and herdsmen from the earliest times who have made various attempts at controlling the effects through the use of medicinal plants. Fulani herdsmen in Nigeria recognize animal helminthosis to be a problem of greatest significance in cattle, most especially calves of

less than a year old. That is why routine herbal treatment is started within 1 week of birth [5].

These pastoralists employed indigenous/traditional knowledge system which has been passed from generation to generation through oral tradition and practice to manage helminths in their cattle. The knowledge has been institutionalized and builds upon in many pastoral communities in Nigeria [7]. Studies have shown that Nigeria is endowed with vast and readily available indigenous knowledge with proven efficacies that have been used by livestock herders [8]. But with the introduction of modern veterinary medicine, the indigenous methods of diseases and parasites control are being relegated to the background and described as stagnant for the new technologies to be adopted. This may be for the assumption that, any innovation or technological breakthrough made by farmers on their own was thought to be accidental and been developed unsystematically through trial and error [9]. It was not long after the introduction of the modern animal health care system in Nigeria, that the system was plagued by many problems. These include inadequate manpower, logistics and inputs, scarce and erratic supply of veterinary services, increasing cost of veterinary drugs and vaccines, poor communication and other modern facilities among others [10]. Due to these problems, the dependence on modern veterinary medicine alone cannot solve most of the animal health problems as expected by the pastoralists.

Despite the relevance of indigenous knowledge of controlling cattle helminthosis and its effects to cattle industry, it is observed that, empirical study on utilization of this knowledge by cattle herders in Adamawa state is not adequately investigated. It is on this note that the study was undertaken to describe the socio-economic characteristics of the herders and ascertain the relationship with application of indigenous control methods of Helminthosis in Cattle.

## METHODOLOGY

### The Study Area

Adamawa State is selected for the purpose of the study. It is located in the North – Eastern part of Nigeria and lying between latitudes  $7^{\circ}$  and  $11^{\circ}$  N of the equator and longitudes  $11^{\circ}$  and  $14^{\circ}$  E of the Greenwich meridian [11]. It covers a land area of about  $42,159 \text{ km}^2$  with an altitude of about 185.9m above sea level. As reported by the National population Commission [12], the state has a population of 3,168,101 persons with an estimated population of 4,038,208 people as at 2014 using the projected annual growth rate of 2.8% as reported by the United Nations Fund for Population Activities - Nigeria (2010). The annual average rainfall of the state is about 759mm with mean annual temperature of  $34.6^{\circ}\text{C}$ .

The state is noted as one of the major livestock producing areas in Nigeria. As reported by the Livestock Census Result of 1991, it revealed that the state has over 2.5 million cattle [24]. The estimated cattle population as at 2014 stands at 3,121,812 based on the one percent yearly increment with over 90% of the total population of livestock in the state owned and managed by the Fulani pastoralists, most of whom are nomadic or semi-settled [13].

### Sampling Techniques

Multistage and purposive random sampling techniques were employed for the study. In the first stage, Seven out of the 21 Local Government Areas of State were purposively selected based on the concentration of registered members of cattle breeders association (commonly being called Mi-yetti Allah) in the areas. In the second stage, list of 199,346 registered members was obtained from the officials of the association and was used as sampling frame. Based on the list of the association, respondents were randomly selected proportionately in relation to the number of registered members from each of the selected areas using Taro Yamane's model as adopted by Kalpana [14]. The formula is expressed as under;

$$n = \frac{N}{1+N(e)^2}$$

Where;

n = number of respondents

N= Population of the study

e = error

In all, a total of 400 respondents were randomly selected. However, out of the 400 questionnaires administered, 363 representing 91.0% were retrieved and used for the study.

### Nature and Sources of Data

Primary data was used for this study and was complemented by secondary information. The primary data was collected through the administration of structured questionnaires to randomly selected herders. The data collected included respondents' personal background such, age, gender, marital status, level of education, household size, herding experience, number of festivities attended among others. The secondary information employed were those retrieved from the internet, review of reports from other related studies.

### Analytical Techniques

Descriptive statistics such as; frequency distribution, mean and percentages was used to analyze the socio-economic characteristics of the respondents while multiple regression analysis was employed and applied in ascertaining the relationship between socio-economic characteristics of the respondents and utilization of the indigenous control methods.

The model was explicitly presented as:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + U$$

Where,  
 $Y$  = Utilization of indigenous helminthosis control methods (proxy by the level of indigenous control methods used)  
 $X_1$  = Farmer's Age (years)  
 $X_2$  = Educational level (proxy by number of years spent in school)  
 $X_3$  = Household Size (Number)  
 $X_4$  = Herding experience (years)  
 $X_5$  = No. of festivities attended (Number)

$b_{1-5}$  = Regression coefficients  
 $U$  = Stochastic error

## RESULTS AND DISCUSSIONS

### Socio-economic Characteristics of the Respondents

Results in Table 1 shows that about 12.1% of the respondents were less than 40 years while 25.3% were above 59 years. The result is in line with the findings of Mahmud [15], that none of the respondents was below 30 years of age in study conducted on medicinal plants used in livestock ailment in Torro, Bauchi State, Nigeria.

The household size of the respondents reveals that 46.5% have family size of less than 10 persons and 15.2% have between 11- 15 persons as members of

their family. This result reveals that there was an average house hold size of 8, which is below African rural average house hold size of 10 [16]. This finding corroborates Aaron [17] and Nalule et al. [18] who reported an average of 7 and 8 people respectively as the average family size among herdsmen in the studies they conducted in Ekiti state, Nigeria and Uganda.

Table 1 below shows that 16.5% of the respondents had formal education (out of which 8.5% had primary, 6.6% secondary and 1.4% attained tertiary education) with majority constituting 83.5% of the respondents have no formal education. From the result, it can be seen that there is high level of informal education among the herdsmen. This may not affect the utilization of the indigenous Helminthosis control methods as most of the educated herders preferred using modern methods of livestock treatment. About 30.8% had 35 - 44 years' experience in cattle herding and 20% had more than 45 years of experience. This result further shows that the respondents are highly experience in cattle herding as 80.2% of the respondents has more than 24 years' experience in cattle herding. Experience generally brings about more knowledge that increased herders' rationality in decision taking on the use of indigenous control methods.

**Table-1: Socio-economic Characteristics of the Respondents (n = 363)**

Socio-economic variable	Frequency	Percentage
<b>Age (years)</b>		
30-39	44	12.1
40 – 49	103	28.4
50 – 59	124	34.2
>59	92	25.3
<b>Household size</b>		
1-5	139	38.3
6-10	169	46.5
11-15	55	15.2
<b>Educational qualification</b>		
No formal	303	20.0
Primary	31	22.2
Secondary	24	10.2
Tertiary level	5	16.9
<b>Herding experience (years)</b>		
< 25	72	19.8
25-34	107	29.4
35-44	112	30.8
45-54	51	14.0
>54	22	6.0
<b>Number of Festivities attended</b>		
1-2	103	28.4
3-4	201	55.4
> 4	59	16.2
<b>Management Practices</b>		
Intensive	6	1.7
Semi-intensive	39	10.7
Extensive	318	87.6

Source: Field Survey, 2014

Knowledge on indigenous control methods of helminthosis among the cattle herders in the study area was orally transmitted amongst themselves. Greater majority of the respondents (83.2%) reported to have acquired the knowledge from their parents/ elders who were herdsmen in their families or during festivities, at markets places or herding places. Farrah [19] opined that rich and efficient ethno-veterinary traditions pertaining to health care and management of livestock exist with the indigenous people most especially in the villages, but this beliefs, knowledge, practices and skills are not documented but transferred orally and informally. This implies that, the indigenous control methods are facing the risk of extinction since the knowledge is being passed orally from generation to generation. Therefore, when an indigenous elder dies, is just like a library burning down with everything tends to disappear and this gradually may have serious local technology transfer between and among the herders over time. Festivities bring together different people from different places with different ideas, experiences, skills and knowledge. The table also shows that all the respondents attends one festivity or the other and at least once in a year. The analysis further reveals that majority (55.4%) of the respondents participates in at least 3 to 4 festivities per annum, 16.2% attend more than four festivities while 28.4% took part in 1 to 2 festivities per annum. One can therefore infer from this result that since all the respondents attend at least a festivity, transfer of the knowledge among the respondents will be easy through farmer to farmer information exchange and diffusion process especially if it if a farmer field day.

The result also revealed that majority (87.6%) practiced extensive system of management while 10.7% practiced semi-intensive and only 1.7% practiced intensive system of livestock management. This indicates that 87.6% of the respondents were nomadic by nature moving over long distances in search of pasture, water and sometimes moving away from suspected disease infested locations and other related danger prone areas to avoid their animals being killed, stolen or for the combine safety of both the herders and their animals.. But in the process of doing this they introduce more infections in their new locations or

aggravate the already existing infections in their herds [20].

### RELATIONSHIP BETWEEN SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS AND USE OF INDIGENOUS CONTROL METHODS

Analysis of the results as presented in Table-2 shows that the coefficient of age ( $X_1$ ) was positive and statistically significant at 1% level; this implies that, as the herder's age increases, the more the tendency of him being strict on the use of indigenous knowledge. The result corroborate the findings of Oyedokun and Oladele [21] and Epu [22] who also found that age had a positive and significance relationship with use of indigenous knowledge in the cure and possible control of livestock diseases in South Western Nigeria and Kenya. Coefficients of Household size ( $X_3$ ) and Experience ( $X_4$ ) were positively and statistically significant at 5% level and hence related to the use of indigenous control methods. This means that herders with large household size will utilize indigenous control methods more. This could be because members may have the opportunities of getting new knowledge from different sources as a result of interacting and interfacing with different people. The positive and significance relationship of years of experience implies that, as the herders experience increases, so also their knowledge on control methods and the ability to make use of the knowledge. Experience would afford him the familiarity, specialization and perfection with the practice of indigenous methods, which could encourage their adherence to these methods.

Coefficient of number of festivities attended by the respondents ( $X_5$ ) was also found to be positive and statistically significant with use of indigenous control methods at 10% level. The implication of this is that, the more the numbers of festivities the respondents attend, the more he will utilize the methods. This may be due the tendencies of acquiring new knowledge as a result of his participation and experience sharing with different category of people that have different ideas. This result is at variance with the findings of Adekunle et al. [23] who reported a non-significant relationship between social participation and use of indigenous control methods of cattle pests and diseases.

**Table-2: Result of the Regression Analysis**

Variable	Coefficient	Standard error	T-value
Age ( $X_1$ )	1.194	0.121	9.863***
Education ( $X_2$ )	0.064	0.070	0.913 <sup>NS</sup>
Household Size ( $X_3$ )	0.270	0.115	2.346**
Experience ( $X_4$ )	0.663	0.325	2.040**
No. of festivities( $X_5$ )	1.395		
Constant	0.836	0.758	1.840*
R <sup>2</sup>	0.96		
Adjusted R <sup>2</sup>	0.94		
F-ratio	4.19		

**Source: Computed from Field Survey, 2014**

\*\*\* = Significant at 1%; \*\* = Significant =at 5%; \* = Significant =at 10%; NS= Not significant

Educational level was not statistically significant with use of indigenous control methods. The non-significance of educational level could be because, formal education is a threat to indigenous knowledge as most of those using the knowledge either they did not acquired western education or had low level of education. Western education could affect the use of traditional practices of livestock management and other related activities negatively by influencing the educated herders to use modern, proven and scientific practices. This argument was supported by Oyedokun and Oladele [21] who asserted that education improves awareness by enabling indigenous people to comprehend the procedures in formulation and use of modern veterinary practices there by making them not practicing traditional methods.

## CONCLUSION

Based on empirical evidence of the study, traditional control methods of cattle helminthosis were found to be well established and utilized by the respondents. The herdsman are widely knowledgeable and they treat helminthosis using remedies which they considered effective and readily available in the study area. It is therefore rational and easy for the herdsman to practice the control methods on their herds.

It was recommended that laws banning tree cutting and bush burning to be imposed. Government should establish policy on intellectual property rights so as to protect, preserve and promote traditional knowledge; this will encourage people with the knowledge to reveal the knowledge. Indigenous knowledge system should be incorporated in the modern teaching of livestock production programmes since the knowledge is well accepted by herders and many of the herders children are into western education.

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