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Adoption of Vaccination and Ethnoveterinary Treatment for Peste Des Petit Ruminant (PPR) among Sheep and Goat Farmers in Ijumu Local Government Area of Kogi State, Nigeria

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Abstract: The economic losses caused by Peste des Petits Ruminants (PPR) in Nigeria was recently said to be over 40 billion Naira due to it high mortality rate that can be as high as 55-90%. Potent Vaccine for preventing the disease has been produced by National Veterinary Research Institute (NVRI). Ethnoveterinary herbs are also used among the rural sheep and goat farmers. The social economic factors influencing the adoption of the available remedies was therefore determined by the use of multiple regression while, the attitudes of farmers towards the said remedies was examined using mean scores from 5 type likert scale. One hundred and two farmers were interviewed. Number of sheep and goat kept by farmers had very high and positive contribution of 53.0 and 41.5%, respectively to the adoption of PPR Vaccine at significant level of 0.058. Mean score of 3.5 out of a maximum score of 5 agreed with the statement that "PPR vaccine prevent PPR disease" while a mean score of 3.22 supported the fact that "they use PPR Vaccine with ethnoveterinary herb". This implies that the level of awareness of the efficacy of the vaccine to prevent PPR is about 70% and level of adoption of vaccination and ethnoveterinary herbs is about 60%. In view of the positive attitudinal disposition to both methods, this study recommends that, PPR vaccine should be made available at affordable cost while collaborative research among all stake holders to provide a complementary and integrated method of managing the disease should be warmly embraced.

Key words: Adoption, PPR vaccination, ethnoveterinary herbs, sheep and goat disease management

INTRODUCTION

Sheep and goat rearing is an integral part of the cultural life and farming system of the rural people of Nigeria as a result, husbandry has remained largely traditional. This has negatively influenced the rate of managing some acute sheep and goat diseases. In essence, high mortality of the livestock occurs due to the traditional ways of handling them. The level of sheep and goat mortality had limited the supply of protein that can be made available for human consumption. Animal protein intake in Kogi State is very low, falling short of the World Health Organization (WHO)'s recommendation of 3.6 kg/day/person. This has informed the state government to set a target of increasing sheep and goat production by 40% in year 2007 (KOSEEDS, 2004).

Disease generally contribute largely to the high morbidity and mortality of livestock. Such disease can be caused by bacteria, parasite or virus. Viral diseases tend to have a high effect on the productivity, morbidity and mortality of sheep and goats. The examples of viral disease affecting sheep and goats are; ort, sheep and goat pox, jag siekte and peste des petits ruminant (PPR). Mohammed (2002) identified PPR as one of the major causes of mortality in sheep and goat under traditional agro pastoral management in Nigeria. Although PPR infections occur under all forms of husbandry conditions, the disease produces the highest morbidity and mortality when large numbers of goals and sheep are reared together and or following the introduction of new animals into established flocks. This is because the only source of infection to susceptible animals is virus that is released into the air in discharge of sick animals (Anthony, 1994). Infection can be spread to new areas by the movement of infected animals. Ezeibe (2005) however, reported that outbreak of PPR in Nigeria usually affect mainly sheep while the goats could be apparently resistant. The infection always result to enormous economic losses.

Shamaki *et al.* (2004) estimated economic losses due to PPR infection to be over 40 billion naira. Although, most of the outbreak of PPR in West Africa are never reported and even for those reported, no proper data are

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available. Durojaiye (1980) in Saliu *et al.* (2007) reported 191 outbreak and 115 deaths among goats in Oyo State while Opasina (1980) estimated loses of 94 animals weighing 803.3 kg valued then at ₦ 2.00 kg^{-1} in a single outbreak. The number of losses and low productivity of small ruminant due to PPR can be explained by the high mortality figures that have been reported. In most of the reports PPR outbreaks occur in flocks, villages or group of villages sharing grazing areas.

Recently, cases of PPR Disease attack were reported in Jos and in Ijumu Local Government of Kogi State. National Veterinary Research Institute (NVRI) Vom among other research institutes in Nigeria has developed potent vaccines called "homol PPR vaccine" for the prevention and control of PPR NVRI while, Okoh (2003) reported that 'Loha' (Tiv language) can be used as ethnoveterinary herb for PPR infection. In quest for adoption level of vaccination and ethnoveterinary herbs for PPR disease, a number of questions may be asked. What is the general attitude of farmers towards the use of this vaccine? Are they aware of such vaccines? Is the vaccine effective, is it readily available? What are the alternative ways to the prevention or control of PPR in the study area? How has the extension workers been handling the PPR disease, is ethnoveterinary herb commonly used for preventing/ treating the disease? If yes, how effective?

The study made attempt to provide solution to the problem questions through the following objectives:

- Find out socio-economic factors that influences the adoption of PPR vaccination among sheep and goat farmers.
- Determine, the level of awareness of the vaccines.
- Compare the attitudinal disposition of sheep and goat farmers to the adoption of PPR vaccination and ethnoveterinary treatments.
- Identify the constraints in the adoption of PPR vaccines.

MATERIALS AND METHODS

The study was carried out in Ijumu Local Government Area of Kogi State, Nigeria which falls between Latitude 7°30' of the equator and also longitude 6°15' east. The population of the local government is about 119,929 according to 2006 census. Structured questionnaire was used to quest for adoption of PPR vaccination and ethnoveterinary herbs from 102 sheep and goat farmers. Stratified random sampling was used to interview 35 sheep and goat farmers from each of the 3 districts in the local government.

The influence of socio-economic factors on the adoption of PPR vaccination and ethnoveterinary herbs was analyzed using multiple regressions with the following functions.

$$Y1 = bo+b1X1+b2X2+b3X3+b4X4\ b5X5+b6X6+b7X7+b8X8+b9X9+b10X10+b11X11+e.$$

$$Y2 = bo+b1X1+b2X2+b3X3+b4X4\ b5X5+b6X6+b7X7+b8X8+b9X9+b10X10+b11X11+e.$$

Where:

Y1 = Adoption of ethnoveterinary herbs and PPR Vaccination.
Y2 = Adoption of PPR Vaccination only.
Bo = Coefficient of the model.
B1-B11 = Coefficients of various socio-economic factors where;
X1 = Sex.
X2 = Age.
X3 = Educational qualification.
X4 = Number of Sheep kept.
X5 = Number of Goats kept.
X6 = Family size.
X7 = Annual income.
X8 = Years of experience in sheep and goat farming.
X9 = Martial status.
X10 = Number of the social organization that a farmer belongs.
X11 = Number of Political titles held and e = Error term.

Data collected on farmer attitude towards PPR vaccination and ethnoveterinary herbs were analyzed using mean scores from five likert type of scale (Blum and Naylor, 1984). In this wise, each item has a weight or score attached to it. A respondent's score on the final attitude scale is the sum of the weight of the alternatives he has checked-weights are usually assigned so that high scores indicate favourable attitudes and low scores indicate otherwise. Six important statements on attitudinal disposition to PPR vaccination and ethnoveterinary treatments (3 on PPR vaccination and 3 on ethnoveterinary herbs) were weighted as strongly agreed (SA) = 5; agree (A) = 4: undecided U = 3; Disagree (D) = 2; strongly Disagree (SD) = 1.

The average mean score was computed as follows:

$$\text{Average mean score} = \frac{\text{Total sum of scores}}{\text{Total number of respondents}}$$

Table 1: Influence of socio economic variables on the adoption of PPR vaccines and ethnoveterinary herbs

Explanatory variables		Unstandardized coefficients	Std. error	Standardized coefficients	T	Sig.
Sex	X1	-0.013	0.237	-0.009	-.056	0.958
Age	X2	0.161	0.179	0.179	0.899	0.373
Education	X3	0.089	0.114	0.131	0.782	0.438
Number of sheep	X4	0.304	0.130	0.427	2.337	0.024
Number of goats	X5	-0.098	0.149	-0.098	-0.681	0.512
Family size	X6	0.038	0.227	0.026	0.166	0.869
Annual income	X7	0.048	0.161	0.056	0.297	0.768
Year of experience in livestock farming	X8	-0.114	0.114	-0.183	-0.998	0.324
Marital status	X9	-0.095	0.196	-0.069	-0.485	0.630
Number of Social organization	X10	-0.189	-0.196	-0.145	-0.984	0.340
Number of political titles held	X11	0.159	0.092	0.338	1.733	0.090
Constant		1.058	1.178		0.898	0.374
Sample size		102.000				

Source: Field survey 2007

Table 2: Influence of socio economic variables on the adoption of PPR vaccines alone

Explanatory variables		Unstandardized coefficients	Std. error	Standardized coefficients	T	Sig.
Sex	X1	-0.618	0.292	-0.418	-2.117	0.048
Age	X2	0.033	0.259	0.034	0.127	0.900
Education	X3	-0.248	0.164	-0.444	-1.501	0.147
Number of Sheep	X4	0.459	0.227	0.530	2.022	0.058
Number of Goats	X5	0.544	0.282	0.415	1.925	0.067
Family Size	X6	-0.025	0.311	-0.022	-0.081	0.936
Annual income	X7	0.120	0.216	0.120	0.558	0.583
Year of Experience in Livestock farming	X8	0.006	0.251	0.008	0.023	0.982
Marital Status	X9	-0.236	0.584	-0.079	-0.404	0.690
Number of Social organization	X10	0.022	0.192	0.024	0.114	0.910
Number of Political titles held	X11	0.167	0.108	0.359	1.538	0.342
Constant		1.925	1.984		0.971	
Sample size		102.000				

Source: Field survey 2007

Table 3: Attitudinal disposition of farmers to the use of PPR vaccine/ethnoveterinary herb

S/No	Attitudinal statement	Strongly agree	Agree	Undecided	Diagree	Strongly disagree	Total of respondents	Total sum of attitude score	Average Meanscore
1.	PPR Vaccine Prevents PPR disease of sheep and goats	19	39	31	8	5	102	365	3.58
2.	Use PPR Vaccines with ethnoveterinary herb	2	27	67	3	3	102	328	3.22
3.	PPR Vaccine has less adverse effects	7	41	39	12	3	102	343	3.36
4.	Ethnoveterinary herb's more effective than PPR vaccine	1	13	71	15	2	102	302	2.96
5.	Ethnoveterinary herb is more readily available	1	11	75	11	4	102	300	2.94
6.	Ethnoveterinary herb is easier to administer than PPR vaccines	2	25	62	13	0	102	322	3.16

Source: Field survey 2007

Descriptive statistics like pie chart, frequency and percentage were used to analyze constraints and awareness level of sheep and goat farmers on the use of PPR Vaccination and ethnoveterinary herbs.

From Table 1, only number of sheep kept had a significant influence (0.24 significant level) in the adoption of both PPR and ethnoveterinary herbs while, number of political titles held influenced the adoption of both PPR vaccines and ethnoveterinary herbs at (0.090) significant level. The number of sheep kept and number of political titles held also had high and positive contribution of 32.7 and 33.8%, respectively. This implies that the more sheep a farmer keeps the more the possibility of adopting both PPR Vaccines and ethnoveterinary herbs. Political titles held can also be a reflection of power and influence. The more such power and influence, the more likely the farmers adopt the PPR vaccines and ethnoveterinary herbs.

From Table 2, age, number of goats kept and family size significantly influenced the adoption of PPR Vaccines alone at 0.048, 0.058 and 0.067 significant levels, respectively. Number of sheep kept and number of goats kept also had very high and positive contribution of 53.0 and 41.5%, respectively. This implies that the more the number of sheep and goat kept the likelihood of adopting PPR vaccines. However, education, family size and marital status negatively contributed (44.4, -2.2 and 7.9%, respectively) to the adoption of PPR vaccine alone.

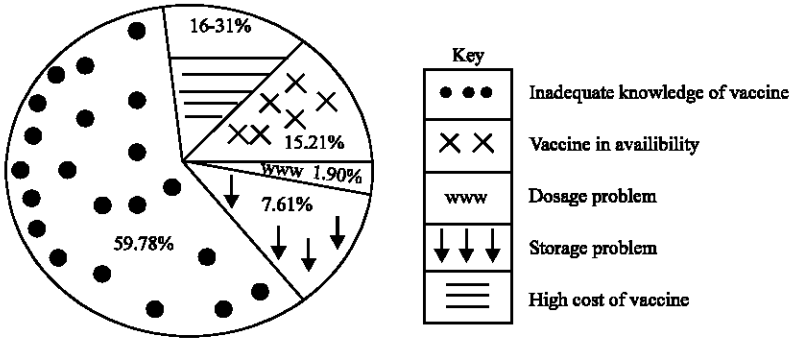

Fig. 1: Constraints to the use of PPR vaccine source: Field survey, 2007.

This implies that high level of education or ones status as married individuals does not necessarily translate into adoption of PPR vaccine. This is in agreement with Agbamu (2006) who said an important factor such as level of farmer's participation in technology adoption may play a more influential role in adoption of a technology than some social economic factors.

Table 3 shows a mean score of 3.58 out of a maximum score of 5, in favour of the statement that "PPR vaccine prevents PPR disease of sheep and goat". This implies that more than 70% of the respondents are aware of the ability of PPR vaccine to prevent PPR disease and such a large number of farmers may likely develop positive attitude towards the use of the vaccine. About 3.22 was the mean score of the respondents who agreed with the statement that "I use PPR vaccine along with ethnoveterinary herbs". This can also be interpreted to mean that the use of ethnoveterinary herbs can be accepted to be popularly adopted among the sheep and goat farmers even while they still use the vaccine. The finding is in agreement with Okoh (2003) who observed that traditional veterinary care among the rural livestock producers in Nigeria constitute the first tier of animal health care delivery as most of the clinical cases presented to the veterinarian would have been first treated with traditional remedies.

A mean score of 3.6 (that is about 70%) of the respondents supported the statement that "PPR Vaccine has less adverse effects". This means quite a significant percentage of he respondents have not observed major adverse effect of PPR Vaccines on their livestock. This situation may encourage farmers to be more interested in the use of PPR Vaccine.

However, a mean score of 2.96 of the respondents shared the view that "ethnoveterinary herbs are more effective than PPR Vaccine". This implies that more than 50% of the respondents are more positively disposed to the use of ethnoveterinary herbs. It means even if PPR Vaccines are served to the livestock of the respondents, many of them may not have the confidence that PPR Vaccine alone will absolutely prevent PPR disease occurrence. About 2.94 mean score of the respondents supported the statement that "ethnoveterinary herbs is more readily available while 3.16 mean score affirmed positively to the statement that "ethnoveterinary herbs are easier to administer than PPR Vaccines". This means that inaccessibility to the vaccine may limit the level of its adoption while technical training required to apply the vaccine or cold facilities to stock vaccines may also discourage the use of PPR Vaccine by the farmers.

The pie chart in Fig. 1 shows that inadequate knowledge of the vaccine was a major constraint in adopting PPR vaccines. About 60% of he farmers do not have adequate knowledge of the vaccine. This implies that most users of the vaccine cannot administer the vaccine on their own but through the assistance of possibly the veterinary agents in the study area. In essence the farmers may pay extra cost to locate the veterinary agents where the agents are very few and reside at the headquarters of the local government or the state. In availability and high cost of the vaccine also served as major constraints. It is reasonable to deduce that since majority of the farmers lack the knowledge of the drug, it might not be wise to supply or sell the drug to them directly.

CONCLUSION

Positive attitude towards any technology is a step towards achieving popular reception of any technology (Saliu *et al*., 2007). The fact that the farmers are positively disposed to the use of both PPR Vaccination and ethnoveterinary herbs is a reflection of the value they have for the two methods. It is therefore expedient that

the two methods be properly harmonized to produce a virile, more readily acceptable drug for the treatment of PPR disease while availability and accessibility of the drug must be ensured. An accelerated step towards this understanding must start now to rescue our sheep and goat farmers from billions of Naira loss to PPR disease.

RECOMMENDATION

From the study, it is very safe to say that, sheep and goat farmers are positively disposed to the use of PPR vaccine. Ethnoveterinary treatment is also an acceptable means of managing PPR disease in the study area. However, the following points must be addressed to enhance effective and efficient use of PPR vaccine and ethnoveterinary herbs. In view of the fact that many farmers still believe in the effectiveness of ethnoveterinary herbs, professional veterinary drug manufacturer and researchers, should organize a collaborative study to integrate ethnoveterinary herbs with PPR vaccine to improve on the efficacy of the treatment as such may have more culturally adapted content. It is also important to note that sheep and goat farmers are pleasantly disposed to the use of PPR Vaccines alone. Veterinary officials and even the PPR Vaccines should be made accessible to the farmers anytime there is an outbreak of the disease.

Agricultural extension workers should be of assistance here as they are very close to the farmers and are better informed on where to locate the veterinary officials. Periodic training may be organized by the extension unit of he National Veterinary Research institute (NVRI) Vom with extension workers of the State Agricultural Development Projects (ADPs) (Extension network) on methods of treating the PPR disease and the need to sensitize the farmers on when to use PPR Vaccine. Popular participation of sheep and goat farmers should be enhanced in the search for identification of he various ethnoveterinary practices they use for PPR treatment and how best they can be complementarily handle the prevention and control of the notorious PPR disease of sheep and goat.

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