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Constraints of Thermostable Newcastle Disease Vaccine Usage among Selected Poultry Production Stakeholders in Ibadan, Oyo State, Nigeria

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Abstract: The study investigated the constraints associated with thermostable Newcastle disease vaccine usage among selected poultry production stakeholders in Ibadan metropolis, Oyo State, Nigeria. Multistage sampling technique was used in the selection of sample size; first stage involved the use of stratified sampling technique while the second stage involves the use of proportionate percentage allocation to get a sample size of 116 respondents. The result was analyzed using descriptive statistics and ppmc. The results revealed that 80.2% of the respondents were males, 86.2% between the age ranges of 20-40 years, 78.4% of the respondents had practiced for Ten years or less. The results also revealed that 86.2% of the poultry production stakeholders are not generally aware of the existence of thermostable Newcastle disease vaccine and 87.1% had no knowledge of the best route for administering the vaccine. The result further shows that the major constraints to thermostable Newcastle disease vaccine usage in the study area was the lack of awareness by poultry production stakeholders on its existence, ranked 1st with a mean value of 3.37; followed by lack of in-service training of poultry production stakeholders ranked 2nd with a mean value of 3.34. Hypothesis testing revealed that there was a significant relationship between years of experience of respondents and their level of awareness of thermostable Newcastle disease vaccine at ($p>0.05$). It is recommended that in-service training be conducted and funded by employers of poultry production stakeholders in the form of workshops, short courses, seminars, symposia, working visits etc to get them updated on the significance and administration of thermostable Newcastle disease vaccine. Extension service should create awareness on the importance and use of thermostable Newcastle disease vaccine through radio and television programs in addition to general enlightment campaigns directed at poultry farmers and poultry production stakeholders in conjunction with the Federal and State Ministries of Agriculture.

Keywords: Awareness, Constraints, Newcastle disease (ND), Thermostable, Thermoliable, Vaccine, Newcastle Disease vaccine (NDV)

INTRODUCTION

Poultry production occupies a prominent position in providing animal protein and accounts for 25% of local meat production in Nigeria [1]. In recent times, the risk of transmission of trans-boundary poultry disease to previously unaffected area has increased as a result of globalization, and this remains the greatest threat to the poultry industry in the country [2]. Reported that if Nigeria wants to increase substantially the protein level in its people diet, then it needs to adopt more dynamic and aggressive livestock policy which is directed more on prevention and control of poultry diseases capable of resultant mortality rate of 75-100% such as Newcastle disease.

Newcastle disease is an acute, rapid spreading, contagious, nervous and respiratory disease of birds of all ages caused by the avian paramyxoviruses serotype 1 (APMV-1) [2]. It is a major viral disease of economic importance in poultry [3] and rated as one of the greatest constraints to the development of poultry production around the world especially the developing countries. The disease can be transmitted through respiratory discharges or other discharges from infected birds and through contact with contaminated feeds, water, equipment, poultry attendants and clothing, leading to high morbidity and mortality [4]. Vaccination has been reported as the only safeguard against endemic Newcastle Disease [5, 6]. Conventional live vaccines are difficult to use under village conditions, as they require a carefully maintained cold chain to ensure their viability in the field [7]. A thermostable vaccine enables distributors and users to reduce the problems associated with inadequate cold chains in the field [8].The [9] recommends thermostable vaccine for the control of Newcastle disease in village chickens in Tropical and

developing countries as a means of improving the food security of rural communities.

The NDV4-HR vaccine which is heat resistant has yielded encouraging results in many countries in Africa [10]. NDV4-HR vaccine is a living vaccine with the following characteristics – it is thermostable, retaining its activity for 12weeks at a temperature of 28^0c in freeze dried form. It can be administered via eye-drop (intra ocular), nose drop (intranasal), oral drench, or drinking water; mixed with certain feeds or by injection [11]. Its ease of administration makes it suitable for use by village farmers. The virus strain can be transmitted by contact from vaccinated to non-vaccinated birds [12]. It is a virulent strain and can be safely administered to chickens of any age from day old chicks to adult birds [11]. Its biological safety is superior to that of other living ND vaccine strains such as B1 or Lasota [12].

The ND1-2 vaccine was produced by the Australian center for International Agricultural Research (ACIAR) at the virus laboratory of the University of Queens Land and intended to be made available without cost to laboratories in developing countries [13]. Strain 1-2 has undergone laboratory test in several countries and has proved to be protective against local virulent strains of the ND virus [14]. In Vietnam, after extensive laboratory and village trials, it has been recognized officially as the ND vaccine for village chickens [15]. In Tanzania, it has given protection for at least two months after vaccination [8]. Field records in Mozambique indicate that the 1-2 ND vaccine provides approximately 80% protection in the flock in the face of an outbreak, when given every four months via eye drop[10].This study investigated the constraints associated with thermostable Newcastle disease vaccine usage among selected poultry production stakeholders in Ibadan Metropolis, Oyo State, Nigeria and results from this research will be of great benefit to agricultural policy formulators, poultry science scholars, poultry farmers and other agro-allied people.

MATERIALS AND METHODS

The study was carried out in Ibadan Metropolis, Oyo State. The city lies in the equatorial rainforest belt and has a land area of 445-545km^2.There are eleven(11) Local government areas in Ibadan Metropolitan area consisting of five urban local government areas in the city and six semi-urban local government areas in the less city [16]. The study population comprises of poultry production stakeholders (Animal scientists, Veterinarians and Animal Health Technologists) that make use of vaccines in controlling Newcastle disease in the study area. Primary data were collected through the use of well-structured and validated questionnaires administered to the respondents. A multistage sampling technique was adopted for this study. First stage involved the use of stratified sampling technique to group the poultry production stakeholders into different categories based on the associations they belong to. Thus, the total number of registered and inducted members of the first category; The Nigerian Veterinary Medical Association in Ibadan metropolis was 345 persons [17]. The Nigerian Institute of Animal Scientist, inducted members in Ibadan metropolis was 170 persons [18]. For the last category; The Nigerian Association of Animal Health and Husbandry Technologist, registered members were 65persons [19].The second stage of the sampling procedure involved the use of proportionate percentage allocation to select twenty percent of the registered and inducted members of each association thus arriving at the sample size of 116. Descriptive statistics and correlation analysis was used in analyzing collected data.

RESULTS

Findings from table 1 indicate that 80.2% of the respondents were male while 19.8% were females. A high (86.2%) of the respondents fall between the age group of 20-40 years. 78.4% of the respondents have between 1-10-years working experience. Veterinarians constitute 59.5% of the respondents , Animal Scientists (29.3%), and Animal health scientist (11.2%).Figure 1 shows that among the very few respondents(16) who were aware of the existence of thermostable Newcastle disease vaccine, 48.7% became aware through seminars/workshops. Another 25.0% through interaction with this research. Result from table 2 shows that 86.2% of the poultry production stakeholders are not aware of the existence of thermostable Newcastle disease vaccine. Most (87.1%) of the respondents have no knowledge of the best route for administering the vaccine. About 91.4% of the respondents have never administered the vaccine. Results from table 3 indicates that lack of awareness by poultry production stakeholders with a mean value of 3.37 was the highest constraint to the use of thermostable Newcastle disease vaccine in the study area. Absence of continuous in-service training for poultry production stakeholders with a mean value of 3.34 was the second highest constraint. Inadequate dissemination of valuable information on thermostable NDV by livestock extension service with a mean value of 3.27 constitutes the 3rd most important constraint. Result from table 4, which looked at the relationship between years of experience of respondents and their awareness of thermostable Newcastle disease vaccine indicate that both are significantly related and so the null hypothesis (Ho_1) which states that there is no significant relationship between years of experience of respondents and their awareness of thermostable Newcastle disease vaccine is rejected.

Table-1: Personal characteristics of the Respondents

Variables	Frequency (f)	Percentage (%)
Gender		
Male	93	80.2
Female	23	19.8
Age		
20-40	100	86.2
41-60	16	13.8
Experience		
1-10years	91	78.4
11-20years	25	21.6
>20years	-	-
Educational Qualification		
Primary Education	-	-
Secondary Education	-	-
Tertiary Education	116	100
Category of Stakeholder		
NVMA	69	59.5
NIAS	34	29.3
NAAHHT	13	11.2

Source: Field Survey, 2014

Table-2: Awareness and knowledge of thermostable Newcastle disease vaccine

Variable	Yes		No	
	F	(%)	F	(%)
Awareness of thermostable NDV.	16	(13.8)	100	(86.2)
Have you ever administered thermostable NDV	10	(8.6)	106	(91.4)
Knowledge of best routefor administering Thermostable NDV.	15	(12.9)	101	(87.1)
Knowledge of how best to transport/ Store thermostble NDV.	10	(8.6)	106	(91.4)

Source: Field survey, 2014. (Percentages are in parenthesis)

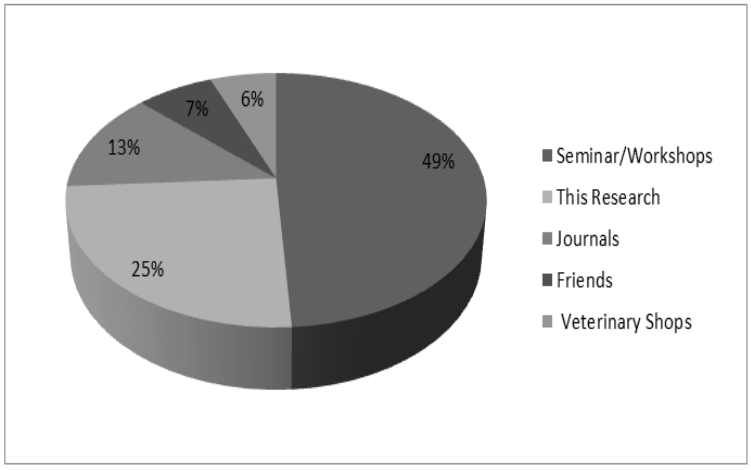

Fig-1: Sources of Awareness of thermostable NDV

Source: Field Survey, 2014

Table-3: Constraints associated with thermostable Newcastle disease vaccine usage

Constraints	Indifferent		Not severe		Severe		V. severe		Mean	Ranking
	F	%	F	%	F	%	F	%		
Lack of in-service training	0	(0)	1	(0.9)	75	(64.6)	40	(34.5)	3.34	2nd
Cost of purchase	40	(34.4)	65	(56)	7	(6.03)	4`	(3.50)	1.78	13th
Problem of determining best delivery system	8	(6.9)	23	(19.7)	66	(6.8)	19	(16.6)	2.83	9th
Lack of familiarity with expected result.	1	(0.9)	24	(20.0)	75	(64.9)	16	(13.7)	2.91	8th
Dissemination of information by Extension agent.	0	(0)	2	(1.7)	81	(69.8)	33	(28.5)	3.27	3rd
Lack of awareness by Poultry production stakeholders	2	(1.7)	14	(12.9)	39	(33.3)	61	(52.1)	3.37	1st
Low antibody response of birds	11	(9.4)	28	(23.4)	71	(60.7)	6	(6.5)	2.62	12th
Non-compliance with manufacturer instruction	2	(1.7)	4	(3.9)	79	(67.9)	31	(26.5)	3.20	4th
Limited knowledge on storing	7	(6)	7	(6)	90	(77.6)	12	(10.4)	2.92	7th
General availability of vaccine	13	(11.5)	20	(17.6)	66	(56.4)	17	(14.5)	2.75	10th
Lack of govt. involvement	0	(0)	5	(4.3)	89	(76.9)	22	(18.8)	3.01	6th
Difficult in vaccinating free Range bird	3	(2.6)	43	(36.8)	57	(49)	13	(12)	3.15	5th
Limited research resource	2	(1.7)	8	(6.8)	93	(79.5)	13	(12)	2.69	11th

Source: Field Survey, 2014. Percentages are in parenthesis.

Table-4: Pearson correlation showing the relationship between years of experience of respondents and their awareness of thermostable Newcastle disease vaccine.

Variable	Level of Awareness	Decision
Experience		Significant
V – Value	-0.181*	
P – Value (0.05)	0.026	
N	116	

- Correlation is significant at the 0.05 level (I tailed)

N = Number of Respondents
< 0.05 = Significant
> 0.05 = Not Significant

DISCUSSION

Majority of the poultry production stakeholders, from the results of this study are not aware of the existence of thermostable Newcastle disease vaccine. This is a surprise as 59.4% of the respondents are veterinarians. A possible explanation for this low level of awareness is indicated by figure 1 where, almost all the respondents did not source information on thermostable NDV from the schools they attended, coupled with the fact that majority of the respondents were in the 20-40 year age bracket, have worked for just 10years or less and so, may not have been exposed to additional training opportunity after school.. This lack of awareness of the vaccine is definitely a serious setback to efforts directed at controlling Newcastle disease in the study area especially, in more remote rural parts of Ibadan metropolis where the use of thermostable Newcastle disease vaccine would be of great advantage in enhancing local food security and the maximization of farm income as such locations lack cold storage facilities required to maintain the efficacy of conventional Newcastle disease vaccines [9]. Recommended thermostable vaccines for the control of Newcastle disease in village chickens in tropical countries and developing countries as a means of improving the food security of rural communities.

Majority of the poultry health workers have no idea of the best route for administering thermostable NDV. This is an indication of poor knowledge of this vaccine and this finding is not a surprise as most of the respondents had earlier indicated not been aware of the existence of the vaccine. According to [20] Thermostable Newcastle disease vaccines can be administered via eye drop, drinking water, certain feeds

and injections. Commercial chickens vaccinated with thermostable ND vaccines via eye drop gave higher antibody levels than drinking water and in feed vaccination [8].

Majority of the respondents have never administered thermostable Newcastle disease vaccine. This may be so because, majority of the poultry production stakeholders had already indicated not been aware of the vaccine and having no idea of the best route for administering it.

For the few respondents who were aware of the existence of the vaccine, Seminars and workshops provided the most common source of awareness. It is rather curious that none of the respondent mention the schools they had earlier attended, Radio/T.V program, or the Federal/State Ministries of Agriculture Program as their sources of awareness. This finding indicate that the Federal, States and local government Agricultural Units and Departments in conjunction with Media Houses and Tertiary Institutions in the country through their curriculum content and out-reach programs have a lot to do in creating awareness for thermostable Newcastle disease vaccine.

The most important constraint associated with the use of thermostable Newcastle disease vaccine as indicated in the study was the lack of awareness on its existence. Equally important a constraint was lack of in-service training for the poultry production stakeholders. In a study [21], stated that better results will be achieved if relevant training is provided for all persons involved in Newcastle disease control. He noted that seminars and short courses for key national and provincial decision makers will help to familiarize people with concepts and assist in bringing people together as a team. Components of the training should include the characteristics, handling and administration of the chosen vaccine, how to organize a vaccination campaign and how to monitor progress [10]. Also important a constraint was inadequate dissemination of valuable information on thermostable NDV by extension service. According to [21, 22], Frontline extension staff must be encouraged to accompany the Newcastle disease control activities and identify other constraints that limit poultry production.

There was a relationship between the years of experience of the respondents and their awareness of thermostable Newcastle disease vaccine as those that are more experienced were more aware. This is logical as those who have spent more years in their chosen professions may have had more exposure, hence, their greater awareness.

RECOMMENDATIONS

It is recommended that in-service training be conducted by employers of poultry production stakeholders who may be Federal, State or local governments or the private sector in the form of workshops, short courses, seminars and symposia to get them updated with the management and administration of thermostable Newcastle disease vaccine. Efforts should be made in creating awareness of thermostable Newcastle disease vaccine in tropical regions with electricity challenges. Local Extension service and concerned Non- governmental organizations should create awareness on the importance of thermostable Newcastle disease vaccine through radio and television programs in addition to general meetings with poultry farmers and the necessary poultry production stakeholders. Also the curriculum of veterinary, animal health and animal sciences in Nigerian tertiary institutions should be continuously updated to capture newer and more current innovations such as the application of thermostable Newcastle disease vaccines in poultry disease management as such knowledge become available.

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