



Causes of Vaccination Failure among Poultry Farms in Kano Metropolis, Kano State, Nigeria

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Abstract – The study was designed to evaluate the causes of vaccination failure in Kano metropolis and environs. One hundred structured questionnaires were designed and administered to poultry farmers on their perceived causes of vaccination failure in poultry. Results revealed that 100% of the respondents believed that vaccination failure was due the used of expired vaccines and improper storage of vaccines, while 85% and 87% of the respondents believed that vaccinations failure were due to poor nutrition and maternal antibody, respectively. Correlation coefficients showed positive correlation between adherence to recommended vaccination schedule and rate of birds' mortality among poultry farms in Kano metropolis and environs. It was concluded that improper storage of vaccines and use of expired vaccine are 100% causes of vaccination failure. Strict adherence to recommended vaccination schedule reduces the mortality rate of poultry among farms in Kano metropolis.

Keywords: Expired vaccine, Improper storage, Mortality rate, Poultry, Vaccination failure.

1. Introduction

Poultry production is an important and diverse component of agricultural practice, providing significant contribution to human requirement for food and greater economic prosperity (Aliyu and Bello, 2018). The poultry sector of Nigeria is worth more than ₦80 billion with an average of 165 million birds, producing about 650,000 metric tonnes of eggs and 290,000 metric tonnes of meat as at 2013 (Sahel, 2015). The need for poultry products has increased over the years because of increase in human population which results in an increased demand for animal protein such as poultry meat and eggs.

Diseases also affect Poultry birds causing reduction in profits or even causing losses due to purchase of drugs and services (Bosha, and Nongo, 2012). Among the diseases causing organisms, viral disease causes high economic losses to poultry farmers due to reduction in meat and egg produced. The viral diseases of economic importance in poultry production include Newcastle disease, infectious bursa disease, infectious bronchitis, avian influenza, etc. The high occurrence of diseases served as one of the main setback in the growth and development of poultry industry.

Vaccination is the application of attenuated organism to animal in order to improve immunity of the animal against the specific pathogenic organism (Ramirez *et al.*, 2013). Implementation of proper of vaccination schedule in poultry farms can prevent losses caused by poultry diseases in a farm (Dana *et al.*, 2000). The most common poultry vaccines are for viral diseases, however, bacterial and fungal diseases vaccines are also available. Other parasitic diseases such as coccidiosis vaccines are at the testing level in different parts of the world (Sharif and Ahmad, 2018).

The goal of this artificial induction of immune responses is to protect the animals against infectious diseases (Abdul-Careem, 2015). The idea of vaccinations are used to keep away or reduce havoc that can happen when the diseases causing organisms appear on farm. Vaccinations involve cost of preventing the occurrence of the diseases. The costs involve that of the vaccine price, labour, time, tissue damage while administering the vaccine and losses due to vaccine reactions (Butcher and Miles, 2017).

Vaccinations are of types, live vaccine and killed vaccine. Live vaccines are vaccines that contain the organism that infect the bird and subsequently proliferate in the chickens' body thereby activating immune response of the chicken against said organism. Only small amount of the organism is administered in the chicken body to proliferate. By proliferation in the chicken, increased number of the organisms are identified by the chicken's immune system, then results in an improved immune system (Butcher and Miles, 2017). Killed vaccines are prepared from an inactivated disease causing organisms that have been inactivated and processed, thus will not spread within the flock and it requires injection individual chicken. This type of vaccines are mixed with an adjuvant before administration. The adjuvants usually used include aluminium hydroxide or an oil. Adjuvant help in enhancing the immune response through increasing vaccine stability in the chicken body (Butcher and Miles, 2017).

A vaccination failure occurs when, after vaccine administration the chickens does not develop adequate antibody titre levels which make them susceptible disease.

In spite of all efforts and interventions, availability and knowledge of the importance of vaccination, vaccination fails and cannot achieve the desired objectives.

2. Materials and Methods

2.1 Location of the Study Area

Kano is located along latitude 11°30' north and longitude 8°30' east, with altitude of 481 meters above sea level (Kano Climate Information, 2011).

2.2 Climate of the Study Area

The study area has savannah vegetation and a semi-arid climate. Kano receives on average annual rainfall of 873 mm, the high percentage of the rain falls between July and September with August been the peak. Kano has hot climate from February to November, while the Harmattan period is December to February, the temperature ranges between 11-14°C (Kano Climate Information, 2011).

2.3 Data Collection

One hundred structured questionnaires were randomly administered to medium scale poultry farmers to collect data on their knowledge of vaccines, vaccination and their perceived causes of vaccination failures. The data collected was reduced using percentage. The vaccination and mortality records of poultry Farms were collected and analyzed using SPSS software. Their adherence to the vaccination schedule were compared to the vaccination schedule designed by PHED AGROVET NIGERIA LTD. Grade is the points or marks were attached to the adherence of the vaccination schedule in which one (1) is a mark set aside when the vaccination practiced on the farm is strictly in adherence to the schedule used as a basis of comparisons. Two (2) is a mark or point awarded to those farms that vaccinate but not in adherence to the recommended vaccination schedule. Three (3) is a mark given to those farms that only medicate during a specific period of production while, Four (4) is a point allocated to Farms when there is absence of both medication and vaccination during specific periods of production. The data collected were analysed using descriptive statistic and correlation coefficient.

3. Results and Discussion

The survey results showed (Figure 1) that one hundred respondents (100; 100%) perceived poultry vaccination failure to be as a result of the use of expired vaccines and improper storage of the vaccines. While ninety nine respondents (99; 99%) perceived vaccination failure to be caused by health status of the flock. Ninety six respondents (96; 96%) believed that vaccination failure is as a result of the use of poor quality water. The result further revealed that, eighty nine respondents (89; 89%) perceived vaccination failure to be due to poor constitution of the vaccine. This result was in line with the findings of Butcher and Miles (2017) whose findings revealed improper vaccine handling contribute to vaccine failure.

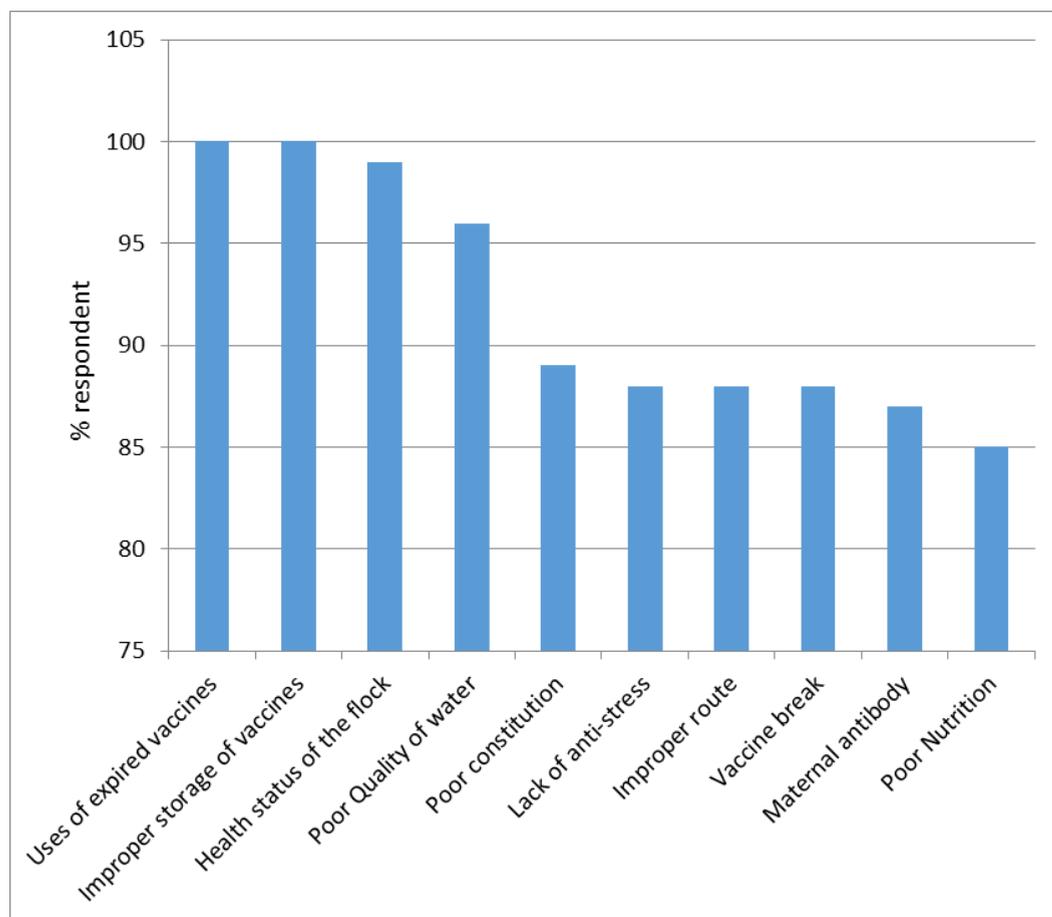


Figure 1. Perceived causes of vaccination failure

The results of adherence to recommended vaccination schedule revealed that Grade 4 (absence of vaccination and medication) had the highest percentage mortality levels of 58.82. Farms that strictly adhere to the recommended vaccination schedule (Grade 1) recorded the mortality of 9.80%. The strict adherence to the recommended vaccination schedule significantly reduces the percentage mortality incidence among the poultry farms. The result is in support of the findings of Sharif and Ahmad (2018) who revealed that adherence to vaccination schedule will enable the bird to develop the require immunity before the onset of the diseases.

Table 1. Adherence to recommended vaccination schedule among some selected poultry Farms in Kano metropolis.

Grade	Percentage
1	9.80
2	13.73
3	17.65
4	58.82

1-Strict adherence to recommended vaccination schedule, 2-There is vaccination but not adhering to recommended schedule, 3- only medication but no vaccination, 4= Absence of vaccination and medication

The results of the correlation between adherence to recommended vaccination schedule and mortality are presented in Table 2. The results indicated that there is a significant difference ($P < 0.05$) between adherence to vaccination schedule and mortality of the birds. This is an indication that vaccination of birds based on the recommended schedule drastically reduces the impact diseases on the survivability of the birds as reported by (Dana et al., 2000).

Table 2. Correlation coefficient between adherence to vaccination schedule and mortality.

	Grade	Mortality
Grade		0.30371(0.0303)
Mortality	0.30371(0.0303)	

4. Conclusion

It was concluded that improper storage of vaccines and use of expired vaccine are 100% causes of vaccination failure. Strict adherence to recommended vaccination schedule reduces the mortality rate of poultry among farms in Kano metropolis and environment.

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