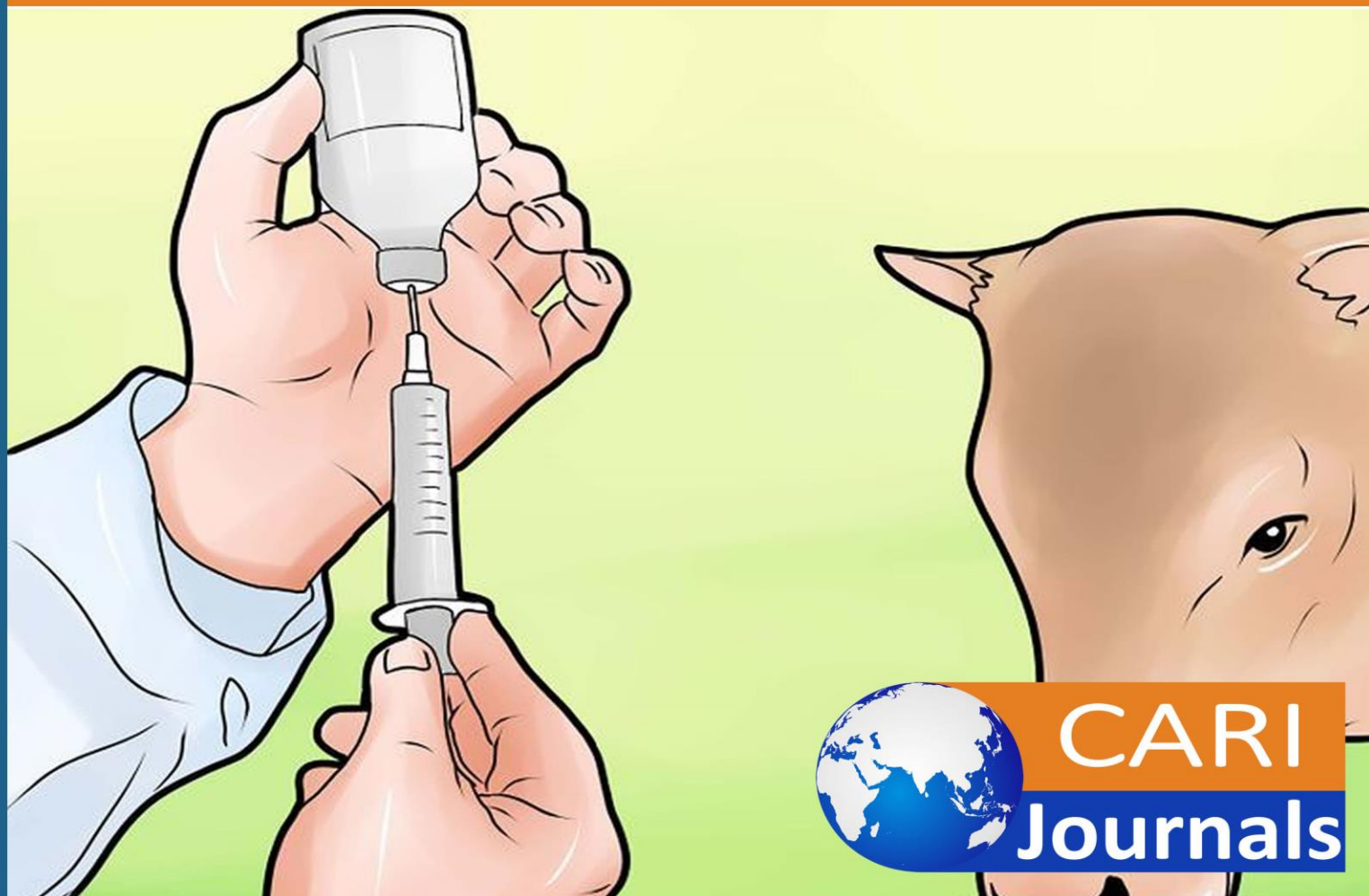


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## **A Review of Effects of Vaccination Failures on Poultry Production in a Climatic Conditions of the Sudan Savannah**

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### **Abstract**

**Purpose:** The review was aimed to access the effect of vaccination failure in poultry production. The most of the causes of vaccination failure such as use of expired vaccine, improper storage of vitamin, health status of the flock, poor quality of water, constitution of vaccines, lack of anti-stress after vaccine administration, improper route of vaccine administration, vaccine break, and poor nutrition significantly contribute to vaccine failure in poultry. Furthermore, strict adherence to vaccination schedule together with good management practice reduces vaccination failure to an economic level.

**Findings:** These revealed that strict adherence to recommended concluded that maintenance of hygiene, improved nutrition, use of potent vaccines and proper constitution can drastically reduce the rate of mortality on poultry production.

**Unique contribution to theory, policy, and practice:** Farmers should strictly adhere to manufacturers' instruction on the vaccine labels as this reduces the dangers of vaccination failure. Government should encourage private agencies in the field of vaccine production and make sure that the vaccines produced meet the approved standard. Poultry farmers Association of Nigeria should be organizing seminars and workshop to poultry farmers on vaccine handling and administration. More researches are expected to be conducted in the field of vaccine failure to test antibody titer level of the treatment set for the investigation. Good management practices

should also be adopted in order to reduce the mortality rate on the poultry farmers. Poultry farmers should adhere strictly to vaccination schedule as this will reduce the rate of mortality on their poultry farms.

**Key words:** *Poultry, vaccination, climate, Sudan savannah*

## INTRODUCTION

Poultry is used to describe any domesticated bird kept for meat or eggs production such as fowls, or chickens, ducks, geese, turkeys, guinea fowls, pigeons etc. (Akinsanmi 1975). Poultry is also defined as any birds reared or hunted for a useful purpose is a member of the bird group collectively known as poultry. Most of the birds are domesticated and managed on the same basic principles as the domestic fowl (Oluyemi, 1983). In the past, poultry keeping was a side-line occupation. That is chickens were kept to obtain some money and in some cases for the pastime of cock fighting. In some communities, the fowl growing cock still depended upon for determining the approach of daybreak (Oluyemi et al., 1985). The poultry industry has many branches; the two main branches are eggs and table meal production. The other branches include the production of chicks, point of lay pullets or ready to lay birds and of poultry feed (Oluyemi et al., 1985). In very recent times, over a span of no more than thirty years, there have been greater changes in methods of keeping poultry than probably in any other sector of the world's livestock agricultural production. It has now become the most intensive of all branches of livestock farming (Sainsbury, 1980).

## Vaccination

Vaccination programmes are designed to prevent or reduce losses caused by diseases in vaccinated birds and or their progeny (Jordan et al., 1999). There are now a large number of vaccines available for poultry. Disease control by vaccination is more effective for some diseases than others and programmes and requirements may vary considerably in different parts of the world. Vaccines work best under considerable of good biosecurity (Jordan et al., 1999). The vaccine is only as effective as the service that uses it, the ability to manufacture vaccine for some specific disease agents varies considerably. Some disease agents generate high levels of protective antibody and exhibit little variation in field types, a single vaccine strain thus protecting livestock against any field challenge (Payne, 1999). Vaccination which is the administration of vaccine into the body for the purpose of enhancing acquired immune response is very important in safeguarding the health of poultry stocks. Hence every effort to minimize vaccination failure which results in the appearance of the disease against which birds are vaccinated is worth practicing by any commercial poultry stock owner (Sparrow, 1994). The objectives of this study were to assess the effects of vaccination failures in poultry production.

### **Significance of Vaccines on Poultry Production**

The importance of vaccines and their roles in disease control cannot therefore be overemphasized looking at the economic implication recorded in the last two decades. The situation of Newcastle disease worsened and some of the poultry establishments suffered severe losses due to frank diseases in layers. On an average 200-250 outbreaks are reported annually in which chickens and growers were involved. Involvement of layers was marked with temporary drop in egg production. Although, the mortality is indicative of vaccination failures (Lamido, 2002). Allan et al. (1981) reported that Gambaro, Marcks and Aflatoxic disease should be controlled not as much as for their sake but for the immunosuppressant they cause.

A large number of diseases affect domestic animals worldwide, but some are more prevalent and more damaging than others. Infectious diseases of livestock in different continents may be different depending on prevalence climatic condition, animal breeds and animal husbandry methods. Climate influences the vegetation, the culture of the people, and the species of breeds of animals they keep. Climate also affects the survival and proliferation of infectious agents and their vector (Lamido, 2002). The common diseases and disorders of free-range poultry may be wide range of organisms or deficiencies (Adesiyun et al., 1984). The disease control measures include non-medical disease control and medical disease control. The non-medical disease control is the most economical and effective means of preventing non vital disease and involves improved management and nutrition. of which the most important aspects are hygiene, housing (ventilation proper spacing and separation of species), flock structure, young chicks care and feeding. Medical diseases controls include vaccination, deworming from internal parasite and treatment for external parasites (NAPRI 1979).

Although, nearly all poultry diseases are found under all types of management conditions, the pattern of diseases in free - range birds are different among species of all ages, and constantly exposed to weather, environment and seasonal outbreak of disease. as well as to germs and parasites found with soil and wild birds and animals. In a 15 years study of the incidence of poultry disease in Northern Nigeria, Saidu et al. (1994) found viral infections (such as ND in chickens and pox in Turkeys) to be the common cause of diseases, although; concurrent viral infection, parasite with parasites constituted about half of the cases studied. They concluded that viruses and parasites caused the most important diseases in indigenous chickens and that they were seasonal in their onset. Vaccination plays an important part in the health management of the poultry flock. There are numerous diseases that are prevented by vaccinating the birds. The purpose of using a vaccine to prevent a particular disease is to trigger or boost the bird immune system to produce antibodies that return light the invading caused organisms a natural invasion. Unfortunately, the damage to the bird suffering such disease is usually too great and the bird either dies or became unauthoritative and nonproductive (Adel and Mehrdad, 2011). Vaccines contain either live or killed microorganism live virus vaccines reproduce in the host to increase their numbers. A killed virus product is dependent upon the number of antigen Units (c.g virus particles) present in the vaccine dose to stimulate antibody production. Most poultry vaccine is

live types. Bacteria vaccines are live or inactivated preparation of bacteria (IF AS, 2009). Some common poultry diseases that are vaccinated are as follows:

- a. **Marek's Disease Vaccine:** Marek's disease vaccine is usually administered to chickens at the hatchery on the day of hatching. It is given subcutaneously at the back of the neck. It is best to order chicks already vaccinated at the hatchery.
- b. **Newcastle Disease Vaccine:** Chicken and turkeys can be immunized against Newcastle disease. Low virulence live virus vaccine are administered by a variety of routes such as drinking water, intraocular (eye drops) intranasal (nose drops), spray. Killed virus oil emulsion vaccines are administered pullets intramuscularly or subcutaneously as a final vaccine prior to the onset of egg production.
- c. **Fowl Cholera:** Fowl cholera effect most birds including domestic fowls, game birds, ducks, cage birds, wild bird and bird in zoological collections and a varies. Oil emulsion bacteria required a series of the injects given at 4 weeks intervals.
- d. **Infectious Bronchitis:** This is a primarily respiratory disease of chickens. Modified live virus vaccine (usually contained the Massachusetts serotypes) are administered in young chickens. Vaccines are effective only if they contain the right Sero-type of virus for a given area. Do not vaccinate during an outbreak.
- e. **Fowl Pox:** There are six closely related strains of pox virus these are fowl pox, canary pox, psittacosis pox, pox can be prevented in chickens, turkeys and pigeons by vaccinated at 9 day of age, pullets at 10-12 weeks, and turkeys at 8-14 weeks of when moved to range.
- f. **Laryngotracheitis:** Laryngotracheitis (L.T) affects both chickens and pheasants. Vaccination against L.T is not as successful as for other diseases, but is an excellent preventive measure for use in outbreaks and in epidemic areas. State approval is required prior to vaccination. Do not vaccinate unless you have a problem on your farm or in your area.
- g. **Avian Encephalomyelitis:** Avian encephalomyelitis (AE) is a viral infection of poultry, primarily chickens, turkeys, pheasants and coturnix quail. Quails life time immunity is acquired through vaccination: Breeder chickens are vaccinated at 10-16 weeks of age and administered in their drinking water. It is important not to vaccinate against the diseases that are not present in the area (IF AS, 2009).

**Vaccination Schedule in Poultry:** Vaccination schedule is a series of vaccination including the timing of all doses which may be either recommended or compulsory, depending on the country of residence.

### Vaccination Schedule for Layers

S/n	Age	Vaccine	Route
1.	5-7 <sup>TH</sup> day	lasota	D/W OR 110
2.	14 – 16 <sup>th</sup> day	IBD	I/O or DW
3.	24 – 16 <sup>th</sup> day	IBD (booster)	DW
4.	30 <sup>th</sup> – day	Lasota (booster)	DW
5.	7 <sup>th</sup> week	Fowl Pox	I/M
6.	9 <sup>th</sup> week		-
7.	10 <sup>th</sup> week		I/M
8.	15 <sup>th</sup> week		-
9.	17 <sup>th</sup> week	Lasota	DW

### Vaccination Schedule for Broilers

S/n	Age	Vaccine	Route
1.	3 – 5 <sup>th</sup> day	Lasota	I/O or DW
2.	7 – 9 <sup>th</sup> day	IBD	I/O or DW
3.	16 – 18 <sup>th</sup> day	IBD (booster)	DW
4.	24 – 26 <sup>th</sup> day	Lasota (booster)	DW

Source: <http://citizens/vaccines sch.htm>

Note: I/N. Intra Nasal, i/o- intra ocular; D/W - Drinking water; I/M Intra muscular.

### Constraints/Problems of Vaccination in Poultry

Vaccination of commercial chickens against Newcastle disease is relatively successfully under taking. Village chickens, by contrast, have proved very difficult key labile, and it is Vaccinate. Conventional Newcastle disease vaccines are relatively heat difficult to retain viability during transport to remote areas and storage in undeveloped village's conventional vaccination Required physical control over the chickens and near feral village. Flocks prove very difficult to catch. Conventional vaccine is sold in large dose vials, usually 1000 doses, which are unsuitable for small family flocks. Village flocks are small, scattered and multi aged, placing them beyond the reach of technical vaccination. Any method of vaccination that is proposed must be suitable for application by the owner of the chickens (Spread brow, 1994).

Alders et al. (2007) stated that the challenges and constraints to vaccinating poultry in areas where - adequate infrastructure and human resources are lacking are addressed in both a technical and a socioeconomic (framework. The key issues area: -

- Selection of an appropriate vaccine and vaccination technique.
- Vaccine conservation and distribution.
- Evaluation of the flocks to be vaccinated in terms of their diseases status, immune competence and production systems,
- Design of effective information, education and communication materials and methods with and for veterinary and extension staff as well as commercial and small holder producer and community vaccinators in rural area.
- Evaluation of mooring systems for technical and socioeconomic factors that affect vaccination.
- Support and co-ordination of and by - relevant public and private agencies.
- The role of simultaneous implementation of oilier control activities in addition to vaccination.
- The importance of assessing the costs and cost effectiveness of various approaches to the control of highly pathogenic Avian influenza (IIP AI), including the prevention of other endemic killer disease and options for cost - sham,
- Evaluation of the incentives for poultry - holders, vaccinators and vaccine producers to contribute Lo and participate in effective vaccination campaigns.
- Policy development and the organizational frame work for short- and long-term implementation and communication to decision- makers.

## DISCUSSION

Most of our poultry farmers blame vaccine when it fails but it is mostly the fault of the farmers themselves Aini, (1990). It was further observed that many farmers lack the knowledge of vaccine, which comes as a result of good extension services. Farmers perceived vaccination failure to occur when the chicks did not develop the antibody titre level or when they are susceptible to filed diseases outbreak. These findings are in agreement with that of Adene, (1990). Farmers perceived vacating sick bird or that incubation a disease as one of the causes of vaccination failure. Vaccinating such chicks is associated with high mortality, Aini (1990). The use of anti-stress by farmers he fore and after vaccination is a means of reducing vaccination failure. This was in agreement with suggestion image by Adene (1990). Among the other factors perceived by the farmers as a cause of vaccination failure are improper handling use of expired vaccine, and vaccine strains. These perceptions were supported by the report of (Aini, 1990).

The success of any vaccination depends not only on the vaccines and the knowledge of the farmers on vaccination but also on several factors most especially immune response of the host to the vaccine. The street adherence to vaccination schedules can reduce: mortality rate in poultry production. This is in agreement with the findings of Butcher and Miles (1994). The mortality rate in poultry may be attributed to poor management practices as this can also contribute to vaccine failure. This was similarly reported by Zander, (1997). Good management and adherence to vaccination schedule have high relationship in reducing mortality in poultry farm. This current observation also agrees with several literature reports (Butcher and Miles,

1994; Owen, 1994). The frequency of the farms that did not practice either medication or vaccination on is very high. This was also reported by Gingeriest, (1997) who stated that commercial poultry companies try to reduce cuts by administering vaccine or administering partial dose.

## **SUMMARY**

The review was aimed at finding out the causes of vaccination failure in poultry production. Which revealed that the main causes of vaccination failure are use of expired vaccines, improper storage of vaccine and health status of the flocks. poor quality of water and poor vaccine constitution. These revealed that strict adherence to recommended vaccination schedule can reduce mortality rate on any poultry production.

## **CONCLUSION**

The most of the causes of vaccination failure such as use of expired vaccine, improper storage of vaccine, health status of the flock, poor quality of water, constitution of vaccines, lack of anti-stress after vaccine administration, improper route of vaccine administration, vaccine break, and poor nutrition significantly contribute to vaccination failure in poultry. Furthermore, strict adherence to vaccination schedule together with good management practice reduces vaccination failure to an economic level. Finally, it was concluded that maintenance of hygiene, improved nutrition, use of potent vaccines and proper constitution can drastically reduce the rate of mortality on poultry production.

## **RECOMMENDATIONS**

The following recommendations were made;

- Farmers should strictly adhere to manufacturers' instruction on the vaccine labels as this reduces the dangers of vaccination failure.
- Government should encourage private agencies in the field of vaccine production and make sure that the vaccines produced meet the approved standard.
- Poultry farmers Association of Nigeria should be organizing seminars and workshop to poultry farmers on vaccine handling and administration.
- More researches are expected to be conducted in the field of vaccine failure to test antibody titer level of the treatment set for the investigation.
- Good management practices should also be adopted in order to reduce the mortality rate on the poultry farmers.
- Poultry farmers should adhere strictly to vaccination schedule as this will reduce the rate of mortality on their poultry farms.



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