

## The Importance of Vaccination in Livestock – An Overview

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### Abstract

Vaccines have a key role in protecting animal and public health, reducing mortality, improving production, reducing the need for antibiotics in livestock feed. Farm animals are highly susceptible to diseases caused by *bacteria, viruses, fungi and parasites*. Therefore, it is important to look out for the animals and ensure that they are protected from any threats of diseases. Animal health is one of the most important factors in farming especially if you are keeping livestock; Veterinary vaccines against different microbial diseases and food borne parasites not only improve the animal health by controlling animal infections but also contribute to increase public health by controlling an important source of food borne diseases.

### Introduction

Vaccination is vital in promoting both animal health and animal welfare, vaccination supports the economic and social stability of farmers and the communities they serve (Kaasschieter *et al.*, 1992). When animals are not well cared, it leads to a reduced resistance to diseases and leads to the development of clinical diseases. Vaccines contain an agent that resembles a disease-causing microorganism and is often made from weakened or killed forms of the microbe, its toxins and one of its surface proteins. Vaccinating animals helps in stimulating an immune response without causing the disease itself. This creates early exposure to disease-causing organisms, where the animal's immune system is able to recall the infectious agent to which the animal is vaccinated. (Morton, 2007). An effective vaccine needs to be highly antigenic; it must strongly stimulate the immune system to respond rapidly in the correct way.

Most of the veterinary vaccines evaluated in livestock against different microbial diseases and food borne parasites belong to one of the following categories: live attenuated



vaccines, killed vaccines, or subunit (and recombinant) vaccines. Live-attenuated vaccines induce a strong humoral and cellular immune response, but their safety is questionable due to the risk of virulence reversion (Innes *et al.*, 2011); while inactivated vaccines are safer and more stable than attenuated ones, but they are less potent and confer a weaker humoral immunity (Lee *et al.*, 2012). On the other hand, recombinant subunit vaccines are easy to store, free of contaminants and proteolytic enzymes since they are chemically produced, and they are able to induce a protective immunity without toxic side effects or cross-linked immune reactions caused by other components present in the pathogenic organism (Nascimento and Leite, 2012). The majority of zoonotic diseases transfer to humans through unvaccinated animals, in the last three decades, over 30 new human pathogens have been detected, 75% of which have originated in animals, mostly originating in wildlife. In fact around 60% of the infectious diseases affecting people are caused by zoonotic pathogens, meaning they have an animal source. It is estimated that around one billion cases of illness and millions of deaths occur every year from zoonotic diseases globally. Some of the most commonly known zoonotic diseases include rabies, avian flu (H5N1, H7N9), SARS (severe acute respiratory syndrome) and MERS-CoV (Middle East respiratory syndrome coronavirus) and now COVID-19.

### **Vaccines play a vital role in the long-term solutions for effective prevention of existing and developing infectious diseases:**

Vaccines are used to protect animals from a wide range of diseases that affects the *production, fertility and economic losses* to the farmers. This is done by stimulating a defensive environment and preparing the animal to resist the impact of a pathogenic microorganism it may encounter later in life. They are efficient in preventing the transmission and spread of contagious animal diseases (zoonotic diseases) from animals to people and from animal to animal. Vaccines ensure that the products such as *meat, eggs and milk* from animals are safe for consumption. They also help in the conservation of food and water into animal proteins and other essential nutrients. A vaccine is a cost-effective method used in preventing animal diseases; they are generally safe, efficient and are associated with few side effects (Lubroth *et al.*, 2007). They are good for long-term prevention because you get to avoid diseases and illness that may cost you more than what the vaccines cost. However, it is important for the farmer to have knowledge and ability on different methods of administering



vaccines. It is always vital to have a vaccination program in place to ensure that livestock herds and profits are well managed. Vaccination increases immunity, reduce the impact of subclinical disease, reduce the spread of food borne disease and eradicate the diseases.

### Conclusion

It is noteworthy that vaccination is a safe tool that would also help reduce resistance by the misuse of antibiotics and other drugs. Therefore, it is important to generate public education strategies to emphasize the importance of vaccination and its benefits.

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