Universal Vaccination against Newcastle Diseases

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Summary

Poultry production in Africa is severely undermined by the Newcastle disease. This viral disease spreads by airborne droplets from coughing or sneezing among infected birds making it highly contagious. Wild birds, contaminated eggs and dirty clothing also transmit the virus. Chickens of all ages are affected but young chicks are most susceptible, with mortality levels as high as 100% percent. In older chickens, mortality is usually lower, but egg and meat production are much reduced. Fortunately, Newcastle Disease is controllable through vaccination and widely practiced by commercial poultry producers. In the past, adopting universal vaccination has proven difficult across Africa, particularly at the village level largely due to the rigorous cold chain requirement for distributing the vaccine. More recently, the development of new thermostable vaccine ND I-2 has resulted in proactive and strict control of this disease threat.

Technical Description

Universal vaccination using the thermostable ND I-2 vaccine is an ambitious but achievable goal. ND I-2 vaccine was developed using a temperature tolerant strain of the Newcastle Disease virus that results in thermostability of the antigen. Nonetheless, cold chain requirements should be respected when transporting the vaccine to remote areas by carrying it in coolers with ice packs. Other advantages of available vaccines include low-cost, availability of smaller vials containing 100-200 doses, ease of reconstitution using pre-packed sterile water, suitability for chickens of all ages and the simple means of application using plastic eye droppers. The latter characteristic minimizes the chances of contamination during application and reduces the risk of vaccine failure. An important backstopping measure is the widespread training of vaccinators.

Uses

Vaccines offer affordable services for smallholder poultry farmers in remote communities. Effective immunity against local strains of Newcastle Disease from many countries is provided by the vaccine.

Composition

Vaccines can be transported in thermos flasks on bicycles and motorbikes and quicky distributed to villages and flocks. This vaccine is easily administered by eye droppers but should be used the same day or following day after refrigerated purchase. After reconstitution (rehydration), the vaccine should be used within 2-3 hours. For full protection of layers, three doses are required at four monthly intervals. Vaccinators use insulated cooler bags, ice packs, syringes, sterile water bottles, and plastic eyedroppers to deploy the vaccines on the specified schedule. Vaccinators must wear recognizable uniforms and badges for wider recognition of their efforts.

Means of application

These vaccines are produced in Africa through a technique known as “master seed egg amplification” from disease-free flocks. In Uganda, Brentec Ltd. recently produced over five million doses of ND I-2 vaccine. DBellium Nigeria Ltd. administered two million doses of ND I-2 vaccine in Jos over one year. Similar production levels occur in Kenya and Tanzania through support from the Global Alliance for Livestock Veterinary Medicines (GALVmed). Prior to vaccination, vaccinators assess the number households and chickens, and then register interested households, agreeing on the date of vaccination. Vaccines are stored at 8°C until deployment. Poultry farmers must gather their chickens in advance to assure streamlined operations.

Agroecologies	All Agroecologies.
Regions	Africa South of Sahara.
Developed in Countries	Benin, Nigeria, Mozambique, Malawi, Madagascar, Kenya, Ivory Coast, Guinea, Ghana, Gabon, Ethiopia, Democratic Republic of the Congo, Central African Republic, Burundi, Botswana.
Available in	Benin, Nigeria, Mozambique, Malawi, Madagascar, Kenya, Ivory Coast, Guinea, Ghana, Gabon, Ethiopia, Democratic Republic of the Congo, Central African Republic, Burundi, Botswana.
Solution Forms	Management.
Solution Applications	Disease control, Livestock Production.
Agricultural Commodities	Poultry.

Target Beneficiaries	Agro-dealers, Commercial farmers, Small-scale farmers.

Commercialization

Commercialization Category

Commercially available

Startup Requirements

Farmers must be sensitized to the threat of Newcastle Disease and be willing to pay for vaccination. Service providers must register clients and arrange for vaccines, usually at three-to-four-month intervals. Chick producers should also vaccinate their young birds before marketing them.

Production Costs

A dose of the ND I-2 vaccine costs only US $0.02 and is inexpensive to administer. A farmer with twenty chickens may expect to pay about $2.50 for one round of vaccination. An investment of only $250 is sufficient to launch a local vaccination campaign at the village level.

Customer Segmentation

There is no specific segmentation regarding vaccination as all poultry owners benefit similarly but larger operators have the option of administering vaccines via drinking water or independently treating their own flocks.

Potential Profitability

Under field conditions in Tanzania and Uganda, data shows that a vaccinator can treat up to 2,000 chickens per month when supported by GALVmed, making it a profitable enterprise.

Licensing Requirements

Administration of vaccines and biologicals, including the ND I-2 vaccine, is governed by the national veterinary services of the respective countries. This is because sourcing vaccines from the right source, cold chain management and vaccine administration are best regulated to ensure the efficacy of vaccines. Vaccine misuse can inadvertently introduce new disease strains with dire consequences on the poultry industry. However, poultry farmers, accessing the service through registered vaccinators do not require licensing rights to use this technology. Vaccinators and veterinarians are therefore licensed and guided by their respective national veterinary drug control laws.

Innovation as Public Good

The solution is a regional public good disseminated by the International Livestock Research Institute.

Solution Images

Symptoms of Newcastle Disease

ND I-2 vaccine is available in small vials

Vaccination droplet to the eye of mature chicken

Institutions

Accompanying Solutions

Biosecurity for Disease Prevention