

# Brief on the I-2 ND Vaccine



## Newcastle Disease

Newcastle disease is a major constraint to indigenous chicken productivity in Kenya and often causes 80-100% mortality in unvaccinated flocks. Outbreaks of Newcastle disease (ND) are unpredictable in many parts of the country and often discourage farmers from investing in the management and welfare of rural chicken. In many cases, vaccination against ND is the only intervention that protects chicken from Newcastle disease.

Commercially available vaccines for the control of ND are effective but require a cold chain during storage and transportation to end users. As such they are not suitable for small, multi-aged, scattered free ranging chicken in rural areas where cold chains are rarely available or difficult to maintain. Commercial vaccines are ideal for large flocks and are packaged in large doses making them unsuitable for farmers with smaller flocks.

Rural production systems have not been conducive for vaccination since they are viewed as low input systems often controlled by women who may not have access to services for various reasons. Most of the 30 million birds reared in Kenya are free range indigenous chicken whose potential in poverty alleviation is unexploited. A market ready chicken is currently sold at about Ks. 1,000 and their demand especially in urban markets is increasingly competing with broilers. Disease control through vaccination has the potential to improve their productivity thus increasing their supply to the market.

The search for a vaccine appropriate for the Kenyan indigenous chicken production system, which is easy to distribute and administer in a rural set-up was thus envisioned.

## I-2 ND vaccine Background

The Australian Centre for International Agricultural Research (ACIAR) commissioned workers at the Virus Laboratory in the University of Queensland to produce a seed virus similar to ND commercial strains that could be made available without cost to laboratories in developing countries. In 1999, forty-five isolates of avirulent ND were examined for effectiveness, safety and ability to spread. The most promising of these isolates were checked for thermostability and the more resistant isolates selected for enhanced heat resistance. The

result was strain I-2, which was amplified in eggs from a disease free flock to form a master seed. The seed was tested for safety and freedom from bacterial contamination.

Strain I-2 has undergone laboratory tests in several countries (Vietnam, Tanzania and Mozambique) and has proved to be protective against local virulent strains of ND virus. In Kenya, ND vaccine of acceptable standard has successfully been produced from strain I-2 ND master seed at the Kenya Veterinary Vaccine Production Institute (KEVEVAPI). The vaccine was produced in eggs, which are not specific-pathogen-free, but which come from a flock that is regularly screened for key poultry diseases. It has been produced and stored in liquid form, and suitably diluted in a protective solution such as 1% gelatin.

The thermostable vaccine is best administered via an **eye drop**. The I-2 vaccine can retain its protective ability for **8 weeks at 28°C** when in freeze-dried form and stored in the dark. Results from trials in Kenya have shown that I-2 ND vaccine provides **62% protection** against Newcastle disease virus in chicken under a free ranging system and over **96% protection** under a confined system. Based on these results I-2 ND vaccine was recommended for registration and commercialization in Kenya.

Since its registration and mass production in December 2012, KEVEVAPI has produced and sold 600,000 doses of the I-2 ND vaccine valued at Ks. 720,000. However, demand for this vaccine is higher than production capacity at KEVEVAPI. The setting up of a distribution network among private local input suppliers will improve accessibility.

## Summarized benefits of I-2 ND vaccine

1. It is thermostable
2. It can be administered via eye or nose drop, oral drench, or drinking water; mixed with certain feeds or by injection ;
3. Its ease of administration makes it suitable for use by farmers;
4. The vaccine strain can be transmitted by contact from vaccinated to non-vaccinated birds;
5. It is avirulent and can be safely administered to chickens of any age from day-old to adult ;
6. Its biological safety is superior to that of other living ND vaccine strains such as B1 or La Sota

## KARIs IMPROVED INDIGENOUS CHICKEN DEVELOPS LIVELIHOODS OF THE INTERNALLY DISPLACED PERSONS IN NAIVASHA



**J**ikaze Village in an Internally Displaced Persons (IDP) Camp in Maai Mahiu division, of Naivasha district in Nakuru County. It is among three IDP camps based at Maai Mahiu. The other two are Vumilia with 235 households and Fumilia with 177 households. Jikaze village has 145 households and is unique in that members purchased land and constructed houses on 50' x 100' plot with minimal support from the government. The other two camps have had immense support from the government through development partners such as UN Habitat.

In 2008, Jikaze Village members organized themselves into income generating groups, such as the New Hope Women Group, now dealing with indigenous chicken production, multiplication and sales. Initially, the group embarked on broiler production through support from the Unga Farm care Limited and Muguku Hatcheries. Profits from broiler production was low due high cost of production and uneconomical flock sizes of between 50 and 200 birds. KARI Naivasha scientists visited the group and sensitized them on the benefits of indigenous chicken production for small scale landless farmers.

The team from KARI used the Farmer Field Schools (FFS) approach to training members from the three villages on indigenous chicken production including housing, brooding, feeding, disease control, vaccination, and breeding. Due to instability and mistrust among members, Vumilia and Fumilia village members dropped out of the FFS training. In 2011, eleven members of the New Hope Women Group from Jikaze village graduated from the FFS. Upon graduation each member received 11 chicken (10 hens and 1 cock) and a semi-permanent poultry housing unit as a start-up. KARI also invited organizations such as the International

Institute for Rural Reconstruction (IIRR) to sensitize the now organized group on the importance of savings and credit to facilitate sustainability and self sufficiency. After the financial training IIRR advance the group Ks. 150,000 to the New Hope Women Group, and members can now receive credit facilities of upto Ksh. 30,000. Currently the group is valued at Ks. 260,000 and has 18 members keeping chicken. Profits from the chicken business range from Ks. 70 to 100 per every day old chick sold aged one month. Members of the New Hope Women Group can now pay school fees for their children and meet other household needs from the chicken business.

Members indicate that the KARI breed of indigenous chicken stands out from the other breeds. Demand for this chicken has increased and members do not have to leave the comfort of their house to look for a market. Indigenous chicken production is not labour intensive and production costs are low compared to other chicken breeds. The breed is more disease tolerant and can also feed on locally available resources. To cut costs, the group members brood and vaccinate the chicks together and make use of the thermostable Newcastle disease vaccine. Input supplies are sourced from reputable agro vets in Maai Mahiu or Naivasha town while day-old chicks and purchased from KARI Naivasha.

The group plans on expanding their chicken business and offer avail credit to more members. They hope to eventually invest in an incubator that will increase the number of day-old chicks they get per brooding cycle. KARIs supply of day-old chicks have long waiting periods, inconvenience many potential farmers.

