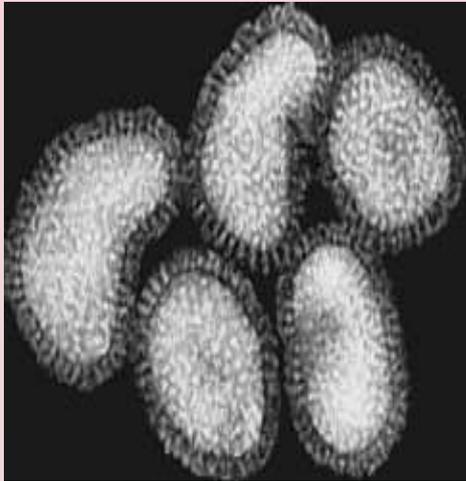




INFORMATION SHEET

AVIAN INFLUENZA (AI) – BIRD FLU



Currently, Avian Influenza is spreading around the world at an alarming rate. This virus poses a threat to human health, and could lead to the next human pandemic of influenza if the virus develops person to person transmission. Apart from this aspect, the virus has very severe consequences for the poultry industries in countries where the virus occurs. This virus is extremely pathogenic to poultry and often caused 100% mortalities.

The AI viruses, along with the other influenza viruses, make up the virus family Orthomyxoviridae. The virus particle has an envelope with glycoprotein projections with hemagglutinating and neuraminidase activity. These two surface antigens, hemagglutinin (HA) and neuraminidase (NA), are the basis of describing the serologic identity of the influenza viruses using the letters H and N with the appropriate numbers in the virus designation e.g., H7N2. There are now 15 hemagglutinin and 9 neuraminidase antigens described among the Type A influenza viruses. The virus that currently poses a threat to human health is the H5N1 virus.

CONTROL MEASURES FOR AI IN POULTRY

1. In countries where vaccination against AI is permitted by the Veterinary Authorities, the first approach to prevent the disease is through the use of a **good vaccination program**. There are reliable vaccines available and every effort should be made to ensure that the flocks are vaccinated against the disease. When birds are vaccinated, their immune system will produce antibodies. When vaccinated birds are exposed to the virus, the antibodies will inactivate the virus and the birds will not get sick. However, this is only the case if the antibody production (titer) has reached protective levels when compared to the virus population present. It is thus important to continually reduce the number of viruses in the environment. This is now possible through the use of the **Virukill-Continual-Disinfection Program**.
2. The other approach, which goes hand-in-hand with a good vaccination program, is the use of an **effective Biosecurity and Disinfection program**. For the implementation of an **effective Biosecurity and Disinfection program** the correct disinfectant needs to be selected. **Virukill** is one of the best products to use in this case because of its unique applications due to reduced toxicity, high efficacy, stability and the fact that it is non-corrosive.



Virukill is a unique patented modification of DDAC chemistry. This unique synthesis of the active has dramatically boosted the efficacy of the standard DDAC molecule to a point where pathogen kill rates are attained at low toxicity rates to the bird, thus creating a unique package of applications which make up the **Virukill-Continual-Disinfection-Program**.

This program has been extensively tested and shown to have high success kill rates on pathogens, and yet no negative effects to any production parameters of broilers, layers and breeders.

VIRUKILL-CONTINUAL-DISINFECTION-PROGRAM

The continual disinfection program consists of:

1. After cleaning, proper washing of surfaces with 1:500 **Virukill** solution.
2. Pre-placement disinfection with 1:100 **Virukill** solution.
3. Treating the drinking water of birds on a continual basis at 1:10 000 dilution ratio (10 ml **Virukill** in 100 liters water).
4. Spraying the air environment in the presence of the birds with approximately 4 ml of a 1:100 **Virukill** solution. For complete directions for use, see label recommendations.

The *in vitro* efficacy: **Virukill** has been tested against Avian Influenza and it has been demonstrated that **Virukill** is very effective in inactivating AI. This virus is an enveloped virus and as such is not very difficult to inactivate. However, due to toxicity of disinfectants, control of AI through the use of disinfectants is limited to areas where birds are not present. Due to reduced toxicity of **Virukill** and the development of the continual disinfection program, AI can be suppressed and thus limited in its penetration of Avian houses. The continual use of **Virukill** during the production cycle is particularly useful in production areas within AI positive regions which have not already become infected with the virus.

Field studies: The **Virukill-Continual-Disinfection-Program** has been used to control the spread of Newcastle Disease and this data has been published in the scientific literature (Onderstepoort J. Vet Res., 70, 219-229). The structure of AI and ND viruses are similar and this scientific data can be applied to AI.

Latest field studies: In a recent disease outbreak, the **Virukill-Continual-Disinfection-Program** was able to reduce the spread of AI on a commercial broiler breeder farm. In Fig 1, the expected mortalities in a poultry house are presented. The actual daily mortalities obtained in the house infected with AI are shown as the Virukill treated group. It can be seen that the daily mortalities in this house were reduced to acceptable levels in relation to potential downside of such an outbreak.

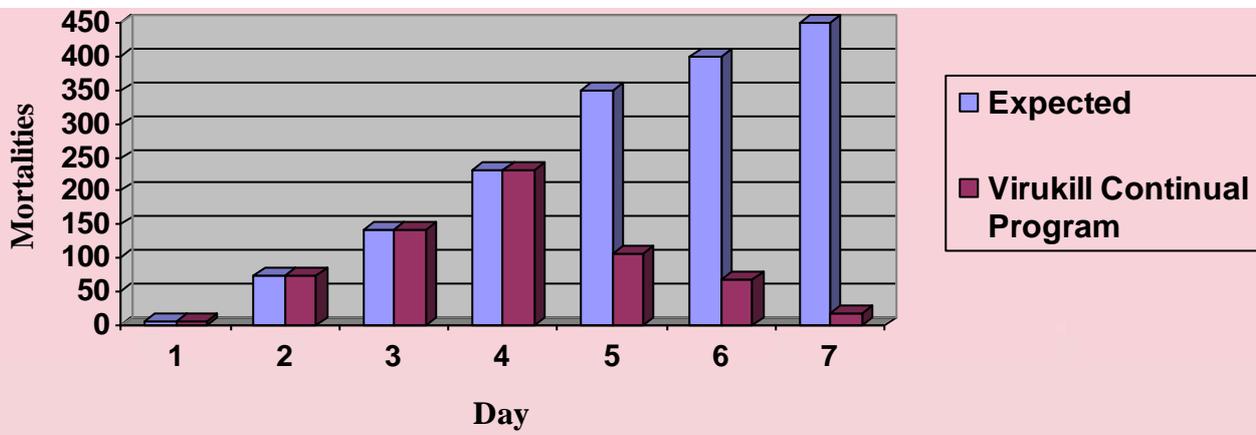


Fig. 1. Expected and Actual mortalities in a case of AI challenge on a commercial broiler breeder farm.

The actual weekly egg production (expressed as a percentage calculated from the total number of eggs over the total number of birds) as recorded on this farm, while experiencing an AI infection and while using the full **Virukill-Continual-Disinfection-Program**, is presented in Fig 2. Both the breed standard under normal conditions and the expected egg production in the face of an AI challenge are also presented in the Fig 2.

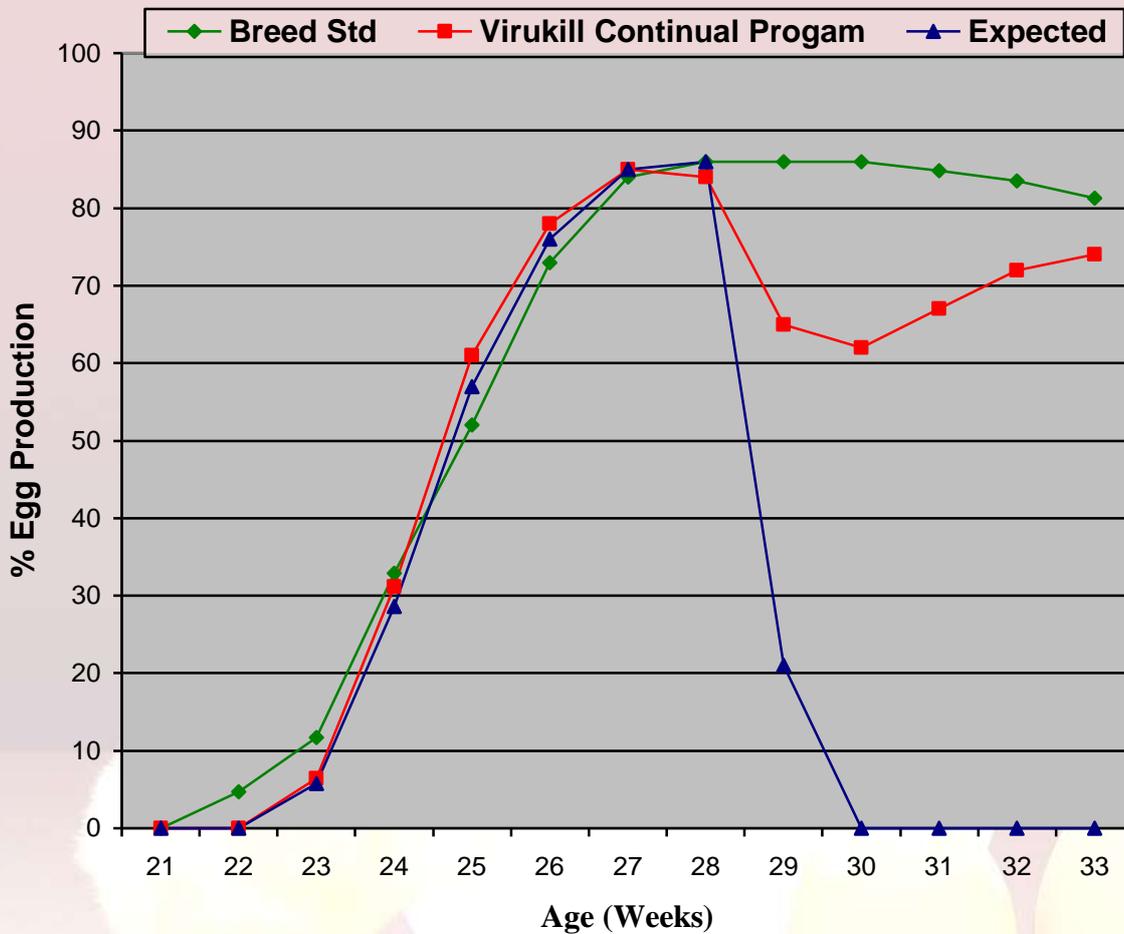


Fig. 2. Weekly egg production data collected from a commercial broiler breeder farm which became infected with Avian Influenza and treated with the full **Virukill-Continual-Disinfection-Program.**

As an illustration the data from this commercial broiler breeder operation shows that the use of the **Virukill-Continual-Disinfection-Program** can restrict the daily mortalities associated with this infection (Fig 1). Even though the AI infection also caused a drop in egg production in the surviving birds, with the help of the **Virukill-Continual-Disinfection-Program**, the egg production started to return to normal within 5 weeks after AI outbreak were recorded.

The **Virukill-Continual-Disinfection-Program** gives poultry producers a very important extra tool in fighting Avian Influenza infections and other disease causing agents. Most importantly, it can be used as an extra preventative fence in protecting flocks, particularly valuable breeding stocks, against Avian Influenza infection, before the problem infiltrates.

With the ever increasing threat of the transmission of H5N1 Avian influenza virus to the human population, and the impending human disaster, **Virukill** is an excellent and safe (non-corrosive) Biosecurity choice for placing the infected areas under strict quarantine and for the disinfection of contaminated areas and control points.

Virukill's efficacy at rate of 0.5 % (1:200) with 10 min contact time is proven against Highly Pathogenic Avian Influenza Virus, H5N1 Subtype, by “*OIE, FAO and National Reference Laboratory for Avian Influenza and Newcastle Disease Istituto Zooprofilattico Sperimentale delle Venezie – Viale dell’Universita 10, 35020 – Legnaro (Padua), Italy*”. This Istituto and laboratory works in accordance with UNI CEI EN ISO/IEC 17025 and ISO 9001 guidelines and the **Virukill** tests were conducted under GLP conditions. (Report available on request)

ALWAYS FOLLOW LABEL RECOMMENDATIONS AS APPROVED IN EACH COUNTRY

Distribution Company name, address, Telephone numbers.

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