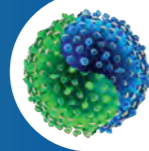


# Infectious Laryngotracheitis Control



Infectious Laryngotracheitis (ILT) is a highly contagious, viral respiratory disease in poultry that has been identified in most countries around the world. Despite efforts to control the disease via vaccination, prolonged epizootics of ILT remain a threat to the poultry industry.

The prevention and control of ILT with conventional live vaccines has bird health risks such as rolling reactions causing respiratory signs and lesions, and decreased bird performance. Moreover, bird to bird passage of the live vaccine virus and latent/persistent infections could make the live vaccine return to virulence. (1,2,3)

There is a need for a new approach for ILT control with safe, non-spreading vaccines.

# Ceva's Approach to ILT Control

Ceva Animal Health has developed safe and effective ILT vaccines without the risks associated with conventional live ILT vaccines. Our vector ILT vaccine: Vectormune® FP ILT +AE is **safe and effective** for ILT, Fowl Pox and AE prevention.

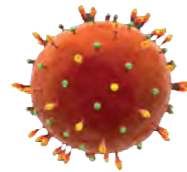
Vectormune® FP ILT+AE is a live Fowl Pox vector vaccine in which 2 important ILT virus genes have been inserted and combined with a live Avian Encephalomyelitis (AE) vaccine.

When the live Fowl Pox virus in our vaccine replicates in the bird it also expresses these important ILT virus proteins, immunizing the birds against Fowl Pox, ILT and AE.

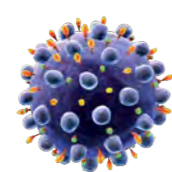
Using a Fowl Pox vector is a safe approach to ILT immunization as it avoids respiratory reactions, bird to bird passage, persistent infections and reversion to virulence.



FOWL POX VIRUS



ILT VIRUS



VECTORMUNE® FP ILT VIRUS VACCINE combined with a live Avian Encephalomyelitis (AE) vaccine.

Illustration showing the development of Vectormune® FP-ILT vaccine.

Vectormune® FP ILT Range Has been used successfully in

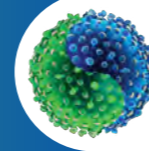
# 46 COUNTRIES

ACROSS THE GLOBE

Now

Vectormune® FP ILT+ AE is available in European Union

# Economic impact of ILT Disease



## Economic impact of ILT infection in commercial layers<sup>4</sup>

The aim on this study was to evaluate the economic impact caused by an ILT outbreak in a commercial layer farm located in Peru, with a population of 14,415 hens (Hy-line brown). The outbreak lasted from August, 2008 to March, 2010.

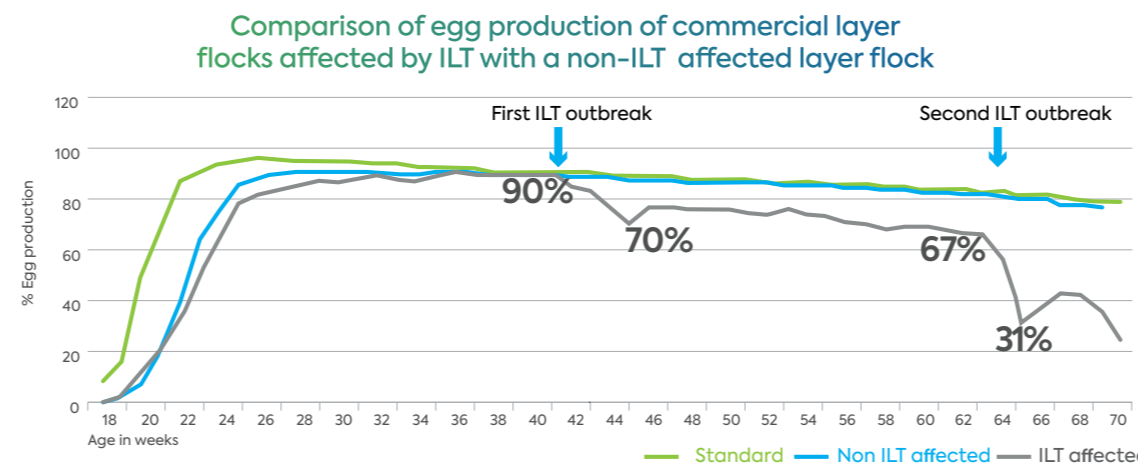
- The outbreak started when the hens were 41-45 weeks of age;
- Second ILT outbreak in the same flock at 62-65 weeks of age;
- Duration of the disease: approximately 6 months.

Production parameters were collected during the ILT outbreak.

### RESULTS

The production performance parameters during an ILT outbreak were compared to historical data (before ILT outbreak) and to genetic line standard. They are summarized in the following table.

Production Parameters	Genetic line standard	No ILT	ILT affected	Difference No ILT vs ILT
Mortality (%)	4.70%	6.78%	22.70%	-15.92
FCR	2.05	2.25	2.53	-0.28
Kg of eggs per hen housed	19.7	17.86	14.87	+2.99
Number of eggs per hen housed	308	283	233	+50



### CONCLUSION

- Infectious Laryngotracheitis caused a negative economic impact by decreasing egg production in both ILT outbreaks, respectively **20%** and **36%**
- Mortality increased by **18%** in ILT infected flock.
- Cost of kg egg production increased by **34%** compared with the results of the previous non-ILT affected flock.

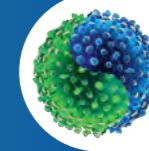


## ECONOMIC EVALUATION

Based on 2018 cost-benefit calculation (mortality, FCR, feed price, number of eggs per hen housed average egg weight, hen price)

# Economic losses due to ILT outbreaks were -39K€

# Infectious Laryngotracheitis Protection

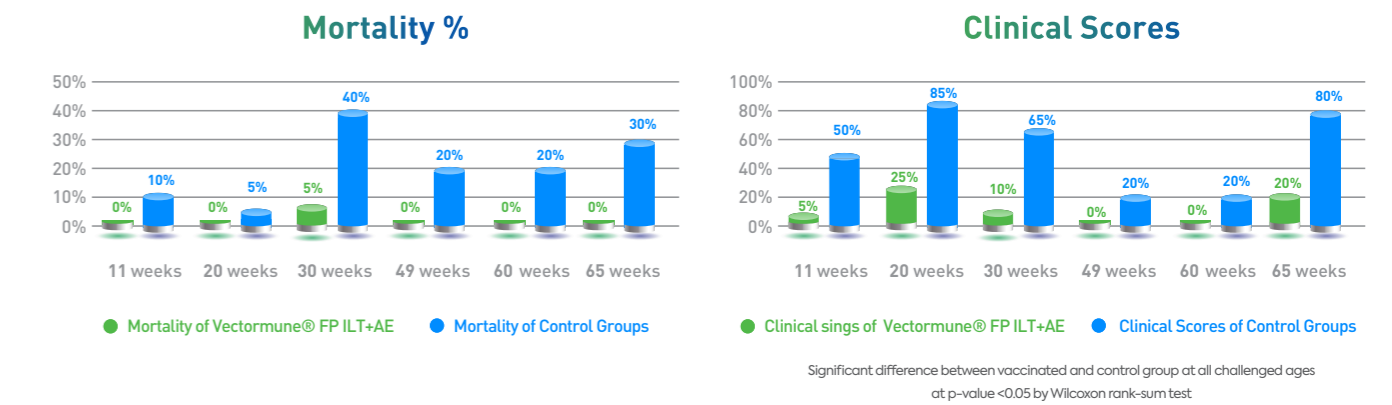


## Onset of Immunity & Duration of immunity<sup>5</sup>

SPF birds were vaccinated with Vectormune® FP ILT+AE at 8 weeks of age via wing web. Non-vaccinated group of birds remained as control group.

Six efficacy studies were performed from 3 to 57 weeks after vaccination. The control group and vaccinated group were challenged with an Infectious laryngotracheitis (ILT) virus strain by the intratracheal route at 11, 20, 30, 49, 60 and 65 weeks of age.

Mortality and clinical signs were recorded 7 days post challenge.



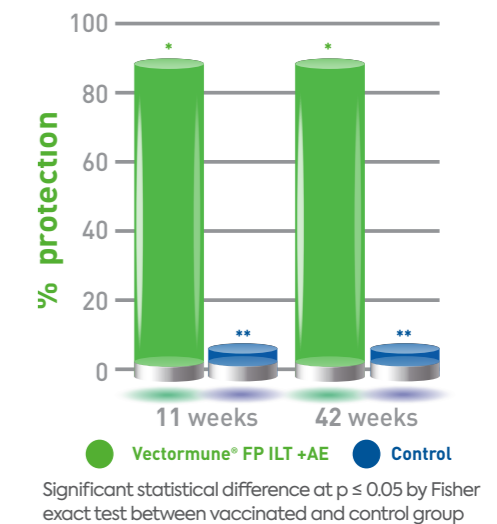
Vectormune® FP ILT +AE vaccinated birds were protected after ILTV challenge at 11, 20, 30, 49, 60 and 65 weeks of age compared to non-vaccinated control birds.

Vectormune® FP ILT +AE provided an onset of immunity against ILT 3 weeks after vaccination and a duration of immunity against ILT until 65 weeks of age.

## Fowl Pox Protection<sup>6</sup>

SPF birds were vaccinated with Vectormune® FP ILT+AE at 8 weeks of age via wing web. Non-vaccinated group of birds remained as control group.

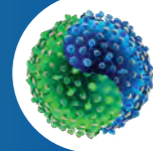
Birds per age group were challenged at 11 and 42 weeks of age with a virulent Fowl Pox virus via the feather follicle route. The degree of severity of Fowl Pox specific macroscopic lesions in the skin was evaluated daily for each bird during the 21-28 days post-challenge observation following a pre-established scoring system of 0 to 4.



Onset of immunity of Vectormune® FP ILT +AE against Fowl Pox was established at 3 weeks after vaccination, reducing the number of affected birds, the severity and duration of their FP-specific lesions.

The duration of immunity was confirmed till 34 weeks after vaccination (42 weeks of age) against severe Fowl Pox virus challenge.

## Avian Encephalomyelitis Protection



The main study parameter was the egg production performance after challenge.

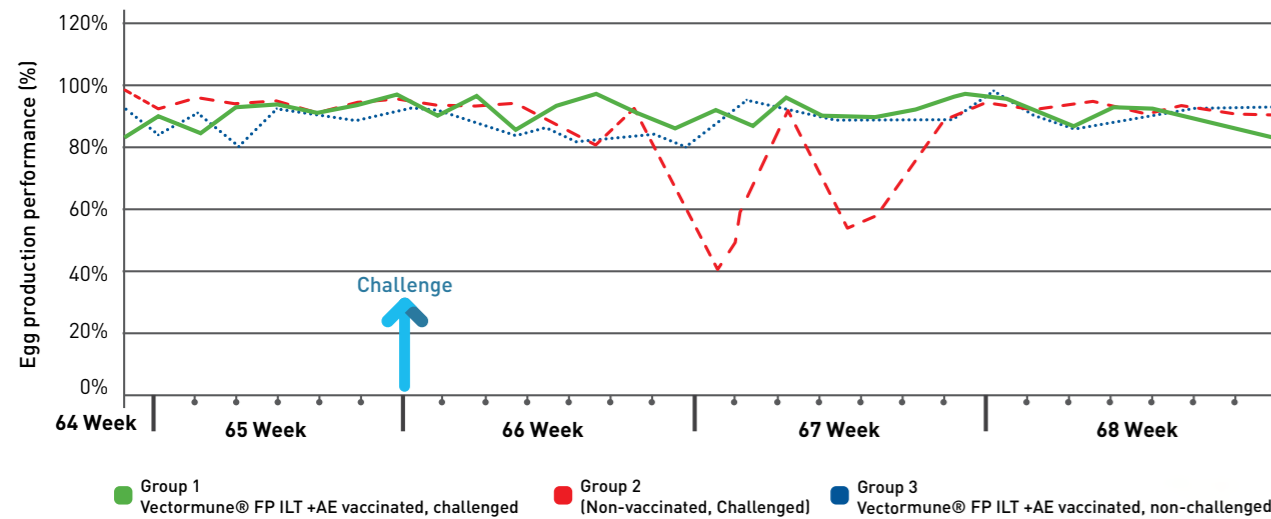
Individual daily egg production and egg quality data of the different groups were recorded. The animals' egg production data were assessed individually and by groups. Post-challenge individual and group egg production were compared to the pre-challenge data.

The commercial layer chickens of Group 1 and Group 3 were vaccinated with Vectormune® FP ILT+AE at 8 weeks of age. Non-vaccinated commercial layer chickens from the same flock were included in the study as Group 2 (non-vaccinated, challenged group).

The birds of Group 3 served as non-challenged egg production control group for this study. The birds from Group 1 and Group 3 were challenged at 28 weeks, 51 weeks and 65 weeks of age with AE Calnek strain 1143 by oral route.

Egg production was recorded for each bird during the 3 weeks' observation period after challenge and the collected data were assessed individually and by groups.

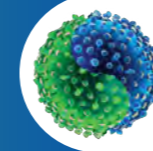
### Egg production performance after 65 weeks of age challenge<sup>7</sup>



Vectormune® FP ILT +AE vaccinated birds were protected after AE challenges. Vectormune® FP ILT +AE was able to prevent the drop in egg production caused by AEV challenge strain up to 65 weeks of age.



## Vaccination Schedule



From 8 week of Age



4 Weeks Before Transfer to Production

### FEATURES AND BENEFITS

#### NO SIDE EFFECTS

- Vectormune® FP ILT+AE is a live fowl pox vector vaccine. It does not induce any post vaccination reaction due to ILT live vaccine replication: no risk of rolling ILT infection.
- Vectormune® FP ILT +AE vaccine neither spreads bird to bird nor reverts to virulence

#### EFFECTIVE PROTECTION

- Vectormune® FP ILT+AE induces a strong immunity against ILT, fowl pox and AE in a single application.

#### COST CONTROL

- Decreased bird handling; 1 application protects against 3 diseases
- NO ILT rolling infection : Better uniformity & NO need of antibiotic usage to control post vaccination reaction.

#### References

1. Bagust TJ. Laryngotracheitis (gallid-1) herpesvirus infection in the chicken 4. Latency establishment by wild and vaccine strains of ILT virus. Avian Pathology, 15:3, 581-595.1986.
2. Bagust TJ., Johnson MA. Avian infectious laryngotracheitis: virus – host interactions in relation to prospects for eradication. Avian Pathology, 24:3, 373391.1995.
3. Graham DA., Mc Laren IE., Calvert V., Torrens D., and Meehan BM. RFLP analysis of recent Northern Ireland isolates of infectious laryngotracheitis virus: comparison with vaccine virus and field isolates from England, Scotland and the Republic of Ireland. Avian Pathology, 29, 57-62.2000.
4. Alvarado J., E. Icochea, P. Reyna, C. Angulo and R. Zegarra. Economic impact of infectious laryngotracheitis in a commercial layer farm in Lima, Pru. Rev Inv Vet Perú; 24 (1): 86-91 2013.
5. EU Registration files study numbers: CLI-155-2016, CLI-33-2016, CLI-153-2016, CLI-024-2017, CLI-25-2017, CLI-100-2017
6. EU Registration files study numbers: CLI-154-2016, CLI-37-2016, CLI-066-2017
7. EU Registration files study numbers: CLI-030-20175

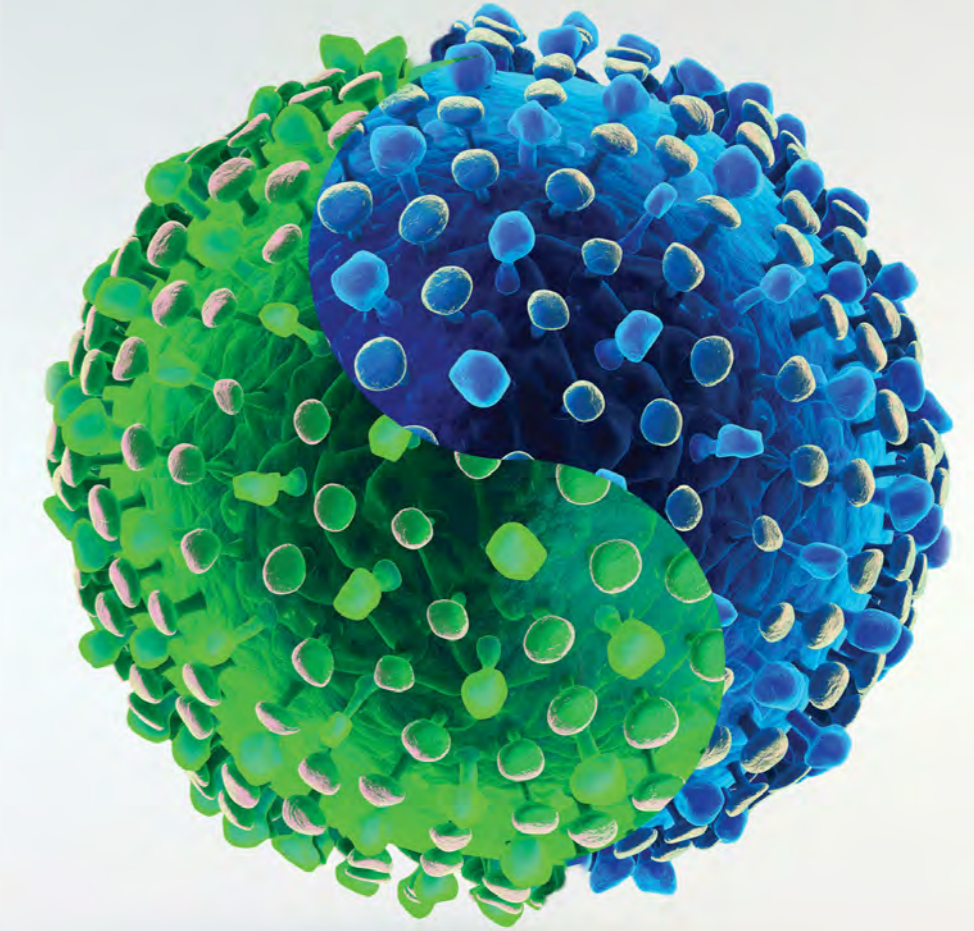
#### SUMMARY OF PRODUCT CHARACTERISTICS

**COMPOSITION:** VECTORMUNE® FP ILT + AE is live Fowl Pox vector vaccine for use in chickens. The Fowl Pox virus expressing of key protective Laryngotracheitis (LT) virus antigens; the membrane fusion protein and the encapsidation protein of avian infectious laryngotracheitis virus. In addition to the Fowl Pox virus vector vaccine contains a conventional live Avian Encephalomyelitis (AE) virus, Calnek 1143 strain. **INDICATIONS:** VECTORMUNE® FP ILT + AE is recommended for wing web application to healthy, susceptible chickens 8 weeks of age or older, but at least 4 weeks prior to the onset of egg production. VECTORMUNE® FP ILT + AE is indicated as an aid in the prevention of Fowl Pox, Infectious Laryngotracheitis and Avian Encephalomyelitis. Chickens receiving this vaccine must not have been previously exposed to field Fowl Pox virus or pox vaccine due to interference with immunity following vaccination.

**ADMINISTRATION AND DOSAGE:** The vaccine is administered once from 8 weeks of age and not later than 4 weeks before the onset of lay. The injection volume is 0.01 ml (10µl). The vaccine is delivered by transfixion of inner side of the wing web using the two pronged-applicator supplied with the product. Vaccine should be used within one hour.

# PERFECT BALANCE

BETWEEN SAFETY AND EFFICACY



Vectormune FP ILT+AE provides ILT, Fowl Pox and AE protection in 1 application with perfect balance between safety and efficacy

