Tracheal Lesion

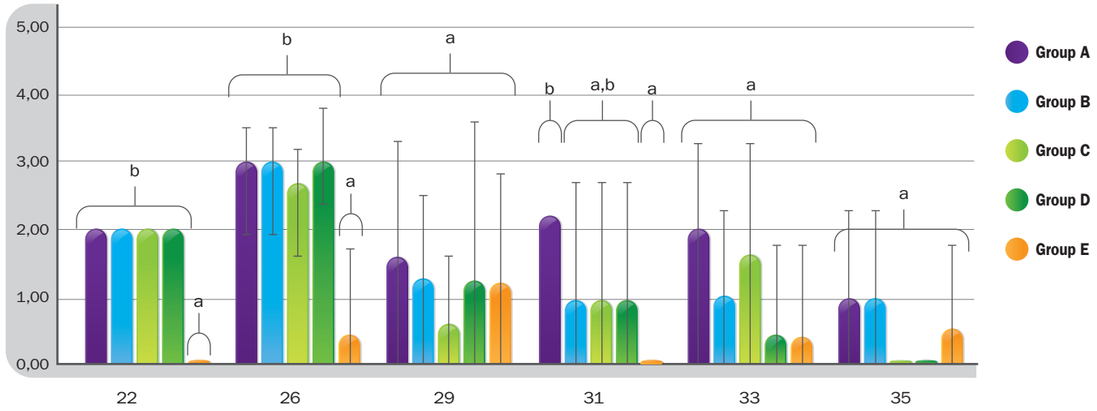

Figure 2: Tracheal lesions

As shown in Figure 2, evolution of tracheal lesion was similar in all groups of vaccinated birds.
At 22 and 26 days of life, 4 and 8 days after vaccination, none of the groups presented statistical differences between them or with group D, but there were such differences, as expected, with group E.
At 29 days of life, there were no statistical differences between the groups, and evolution of lesions was similar in all the birds.
At 31 days of life, groups A, B and C presented the same evolution and there were no statistical differences between them; there were only such differences between groups A and E.
At 33 and 35 days of life, the birds had the same level of lesions and all of them had recovered by day 35. There were no statistical differences between groups.

5 CONCLUSION

To make responsible of the presence of respiratory symptoms and lesions detected in the field to a vaccination programme or vaccine reaction it's easy. However, more factors used to be involved in it.
As shown in this trial, animals vaccinated against Newcastle disease (ND) and challenged with a common Infectious Bronchitis (IB) strain located in a country, in this case South Africa, do not show differences with other birds not vaccinated and challenged with the same kind of IB isolate or with birds not vaccinated against ND and not challenged with an IB isolate.
Furthermore, a vaccine like HIPRAVIAR® CLON shows better performance and body weight in vaccinated birds than other marketed vaccines, presenting similar weights than those found in unvaccinated, unchallenged birds.
Regarding the possibility of HIPRAVIAR® CLON reactivity when it is applied in the field or when it is applied trying to reproduce field conditions, it is shown that HIPRAVIAR® CLON does not present higher levels of reaction than other available vaccines.
Note the importance of an optimal vaccination method and its correct application to obtain the best response to the vaccine.
In sum, an optimal vaccination programme, depending on the country or ND pressure area in which the animals are present, is a necessity, and HIPRAVIAR® CLON is a proven vaccination option because of its low pathogenicity, shown in this trial, and its high immunogenicity and protection shown in the field due to its high titre, one of the highest marketed worldwide.

6 REFERENCES

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EVALUATION OF POSSIBLE SIDE EFFECTS OF NEWCASTLE VACCINATION IN A SOUTH AFRICAN COMMON CHALLENGED FIELD SITUATION

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1 INTRODUCTION

Newcastle disease is one of the most significant poultry diseases worldwide because of its wide distribution, high mortality rates and meat export restrictions.
With a huge distribution, it is known in South Africa as a disease controlled by vaccination programmes in layers, broiler breeders and broilers.
Although Newcastle disease outbreaks are high at present, they are controlled by vaccination within the poultry population, but other respiratory diseases play an important role, including Infectious Bronchitis (IB), which can affect birds and cause severe post-vaccination reactions.
This is the main reason why the Avimune veterinary group decided to evaluate degree of reaction to three commonly used and marketed Newcastle disease vaccines in South Africa. HIPRAVIAR® CLON is one of the vaccines tested.
In order to recreate field conditions, birds were challenged after vaccination with variant IB-QX isolated from the field.
This paper presents the results obtained.

2 OBJECTIVE

To evaluate possible reactions caused by Newcastle disease vaccination with live attenuated vaccines, one of which is HIPRAVIAR® CLON, when animals are challenged with an Infectious Bronchitis strain isolated from the field, trying to reproduce the commercial field situation that South African producers and veterinarians face.

3 TRIAL DESIGN

Two hundred and twenty-seven (227) day-old Ross 308 commercial broiler chicks from a single MG/MS negative parent flock of 45 weeks of age were randomly allocated to two groups and placed into two different isolators.
Feed and water was supplied ad libitum.
All birds were weighed and identified and colour-classified according to weight and isolator.
From one day of age, the birds grew together until day 16 of the trial, when they were randomly divided into six isolation units, according to vaccination group and trial design. The vaccination groups and distribution of the birds are shown in Table 1.

Table 1: Vaccination groups and bird distribution

GROUP	No. OF BIRDS	ISOLATOR UNIT	VACCINATION TREATMENT
GROUP A	45	Unit 5	HIPRAVIAR® CLON
GROUP B	45	Unit 3	VACCINE B
GROUP C	45	Unit 2	VACCINE C
GROUP D	46	Unit 6	POSITIVE CONTROL (Not vaccinated and challenged)
GROUP E	46	Unit 1	NEGATIVE CONTROL (Not vaccinated and not challenged)

The weights of all the birds were recorded individually at 16, 21, 28 and 35 days of life.
All birds were vaccinated against Newcastle disease. The birds were eye-drop vaccinated at a dose of 0.05 ml each on day 19 of the trial and challenged intratracheally with 0.2 ml of IB-QX variant strain isolated from the field.
After vaccination, mortality, tracheal and air sacculitis lesions scores were recorded.

Vaccination treatment	Product specifications
HIPRAVIAR® CLON A	Live vaccine strain Clone Cl/79 ≥ $10^{6.5}$ EID_{50}
VACCINE B	Clone VH lentogenic strain
VACCINE C	Asymptomatic VG/GA strain
IB isolated strain	**Challenged**
IB QX like isolate	Antigen titre 1x$10^{6.4}$/ml. Diluted at a 1:10 dilution producing challenge material of 1X$10^{4.4}$

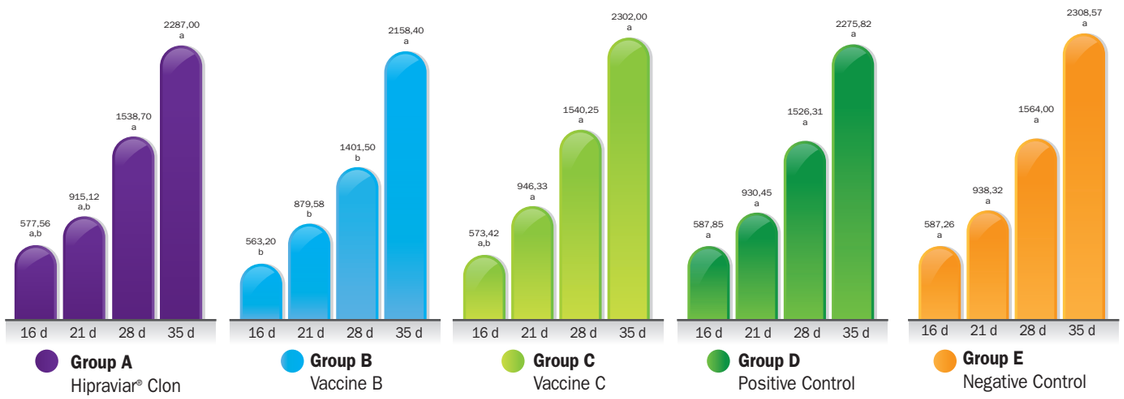
Table 2: Vaccination treatments and IB isolated strain used for infection

4 RESULTS

Body weight was recorded at 16, 21, 28 and 35 days after vaccination. On day 16, the birds were randomly distributed into five different groups, endeavouring to achieve a homogenous weight distribution. This is a measure to get animals used to a new distribution and situation just before vaccination.

On day 19 of the trial and of life, the birds were vaccinated and challenged, just three days after their re-distribution.
Finally, there were no statistical differences in body weight among groups A, B and C, although there were numerical differences. Group B presented statistical differences with groups D and E, which are positive and negative controls, respectively.

As shown in Graph 1, at 21 and 28 days, periods of time when the vaccine virus is supposed to replicate, groups A and C seemed to perform similarly to group E, not vaccinated and not challenged, and to group D, not vaccinated but challenged.
Regarding group B, there are statistical differences with groups E and D, but those come from the random distribution.



Graph 1

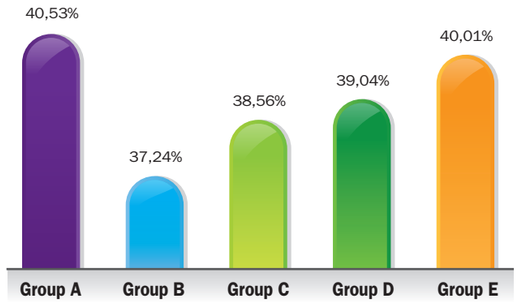
Graph 1: Body weight recorded during trial at 16, 21, 28 and 35 days of life and trial. Groups A, B and C are the groups tested and compared with each other and with groups D (positive control) and E (negative control).

Because of the statistical differences showed at the outset with the birds' distribution, it is preferable to compare growth performance and behaviour within each group rather than comparing among groups.

Graph 2: Growth percentage between 21 and 28 days of life of birds, two and seven days, respectively, after vaccination, a period both when the virus is supposed to replicate and when a vaccine reaction is most likely.

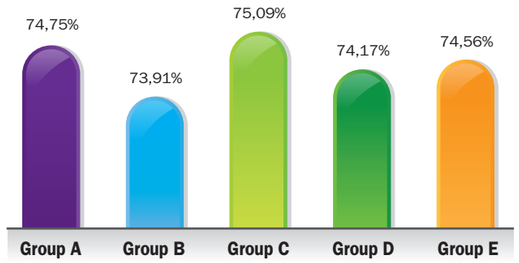
Regarding the growth percentage during the period between 21 and 28 days of life (2 and 9 days after Newcastle vaccination and IB challenged), only group A exceeds the 40% growth percentage shown by group E (not vaccinated and not challenged) and the percentage shown by group D.

Growth percentage during 21 to 28 days



Graph 2

Global growth percentage after vaccination (16 to 35 days)



Graph 3

Graph 3: Growth percentage between 16 and 35 days of life of birds just two and nine days after vaccination, respectively, a period when the virus is supposed to replicate and when further vaccine reactions may occur.

At the end of the trial, it is observed that there are no statistical differences between groups, only numerical differences that seem to be in detriment to group B. However, all groups recovered and stayed at the level of groups D and E.

Furthermore, keeping in mind the global growth percentage, only group B is below the growth percentage of groups D and E.

Group A (HIPRAVIAR® CLON) and group C are at the same growth level as groups D (not vaccinated but challenged) and E (not vaccinated and not challenged), so possible reactions caused by vaccines do not interfere in normal growth and the combination of vaccination and IB challenge does not seem to affect the birds, at least in this trial.

Regarding mortality during the post-vaccination period, only group D showed high mortality, with three dead birds at 22, 28 and 31 days. Groups A and B presented one death each, at 28 and 29 days of the trial, respectively, and, finally, there was no mortality in groups C and E.

Vaccination against Newcastle disease is positive because it protects against the disease and does not interfere with normal bird growth, with flock mortality remaining at a normal rate.

HIPRAVIAR® CLON keeps growth levels the same as in the control groups, so vaccinating with HIPRAVIAR® CLON does not seem to interfere with normal flock growth.

The second part of the trial focused on the observation of lesions caused by the interaction between the vaccine and the IB-QX like variant isolate.
Two birds from each group were randomly selected and euthanised at 22, 26, 29, 31 and 33 days of age.

Tracheal lesions were assessed using the following scoring system according to tracheal damage: 1- normal trachea, 2- mild discolouration, 3- trachea notably red, 4- tracheal plugs.

Air sacculitis lesions were assessed using the following scoring system: 0- no air sacculitis, 1- mild air sacculitis (mild foamy appearance of the air sacs), 2- opaque air sacs with vascular changes, 3- severe air sacculitis with exudate present on air sacs.

Regarding air sacculitis, it was noticed that during the study period the birds presented a similar lesion score, with no statistical differences between groups during and at the end of the trial.

Air Sacculitis Lesions

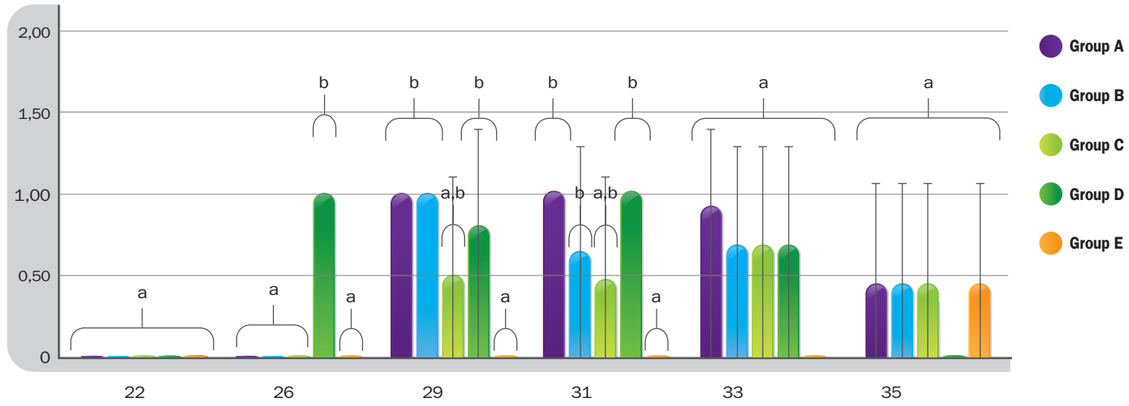


Figure 1: Air sacculitis lesions

At 22 and 26 days of life, just 4 and 8 days after vaccination and IB challenged, groups A, B and C did not show differences with group E, while group D presented air sacculitis lesions at 26 days.
At 29 and 31 days of life, groups A, B and C presented no statistical differences between each other and group D, so air sacculitis lesions do not seem to be directly due to vaccination.

At 31 and 33 days of life, all birds recovered and there were no statistical differences between groups or with group E, not vaccinated and not challenged.