

4 CONCLUSIONS

-The results showed that the vaccination of the broilers with a commercial dose of the different commercial vaccines did not induce any clinical signs and hardly any macroscopic lesions of congestion and oedema.

-The results obtained demonstrated that Hipragumboro® GM97 induced the lowest reduction of bursa weight as indicated by the highest BBW and BSW ratios observed.

-Hipragumboro® GM97 induced the lowest level of B-lymphocyte depletion at 14 days post-inoculation.

-Furthermore the group vaccinated with Hipragumboro® GM97 showed the quickest bursa recovery.

5 REFERENCES

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EVALUATION OF THE IMPACT ON THE BURSA AND ITS RECOVERY AFTER THE ADMINISTRATION OF HIPRAGUMBORO® GM97 AND TWO OTHER VACCINES IN COMMERCIAL BROILERS



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1 SUMMARY

In this study we determined the effects on the bursa of Fabricius induced by Hipragumboro® GM97 in comparison with two commercial Gumboro vaccines of the same category intermediate plus. For this purpose 4 x 35 commercial Ross broilers were placed in 4 isolators at one day of age. At 16 days of age they were vaccinated via oral route with a dose of the different commercial vaccines. The clinical signs were monitored daily from day 0 to day 35 post vaccination. Birds were euthanized at different time intervals (0, 3, 7, 14, 21, 28 and 35 days postvaccination), and macroscopic lesions of the bursa, the bursa body weight (BBW) ratio, bursa spleen weight (BSW) ratio and B-lymphocyte population in the bursal follicles were recorded.

The results demonstrated that vaccination of the broilers with a dose of the commercial vaccines did not induce any clinical signs and the bursas hardly showed any macroscopic lesions of congestion and oedema.

Both ratios (BBW and BSW), the profile of bursal damage and subsequent recovery were different among each vaccinated group included in the experiment. The group vaccinated with Hipragumboro® GM97 showed the highest ratio of BBW and BSW, which indicates the lowest affectation of the bursa weight. Hipragumboro® GM97 induced a level of B-lymphocyte depletion of 1.8 at 14 days post-vaccination, while the other two vaccines (B and C) produced a level of bursa damage of 3.5 and 3.2 respectively. Furthermore the group vaccinated with Hipragumboro® GM97 showed the quickest recovery of the bursa.

All these parameters indicated that Hipragumboro® GM97 had the highest safety characteristics of all the vaccines included in the experiment.

2 MATERIAL AND METHODS

Chickens

A total of 160 male Ross broilers hatched at a commercial hatchery were used for the experiment. 20 broilers were bled at day of hatch for the estimation of the optimal age of vaccination using the Deventer Formula (breakthrough titre of 500 in the IDEXX ELISA).

The remaining 140 broilers were divided in 4 groups of 35 chicks (A, B, C and D) and located in four pressure isolators at one-day of age where they remained throughout the experiment. They were fed with a commercial broiler feed and provided with water *ad libitum*.

Vaccine

Three commercial Gumboro vaccines of the same category were included in the experiment; Hipragumboro® GM97 (A) was compared with two commercial vaccines (B, C).

Vaccination

The vaccines were administered at 16 days of age, calculating the day for vaccination time using the Deventer Formula (breakthrough titre of 500 in the IDEXX ELISA).

The content of 1 vial of each vaccine was reconstituted in 1000 ml of sterile distilled water at 4° C. One commercial dose of each vaccine was administered via oral route using a syringe without needle.

Sampling and study design

At 0, 3, 7, 14, 21, 28, and 35 days post vaccination, 20 chicks (5 chicks from each group) were euthanized. The selection of the birds was at random.



The following evaluations were performed:

- Chicks were observed daily throughout the experiment for any clinical sign.
- Body weight, bursa weight, spleen weight were recorded.
- Macroscopic appearance of the bursa of Fabricius was recorded.
- Each bursa was placed in a labelled tube containing 10% buffered formalin and processed for histopathology.

B-cell score

Bursas were removed and fixed in 10 per cent neutral buffered formalin. Sections were cut, stained with B-cell specific monoclonal HIS-C1 (Janse and Jeurissen, 1991) and examined microscopically. In the microscopic examination, a scoring system to evaluate lymphocytic depletion, similar to those described by Sharma et al. (1989), was used to evaluate the microscopic lesions observed in the bursa of Fabricius. One hundred follicles were randomly selected and examined for each individual chicken. The lymphocytic depletion was scored from 0 to 5, depending on the intensity of the lesion. All sections were then graded 0 to 5 according to the following criteria:

- 0:** less than 5 % of the lymphoid follicles affected
- 1:** 5-25 % of the lymphoid follicles affected
- 2:** 25-50 % of the lymphoid follicles affected
- 3:** 50-75 % of the lymphoid follicles affected
- 4:** 75 to less than 100 % of the lymphoid follicles affected
- 5:** 100% of lymphoid follicles affected

A follicle was considered as damaged if 75 % or more of the B-cell population of the follicle was lacking.

3 RESULTS

Clinical signs following vaccination.

The vaccinated and control groups showed no clinical signs during the observation period of 35 days.

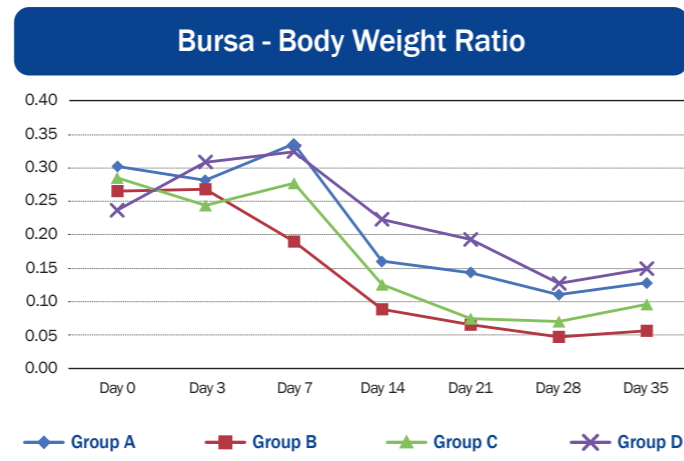
Macroscopic lesions

Some minor oedema lesions were seen at 14, and 21 days post-vaccination (dpv) in some of the vaccinated broilers. Some slight haemorrhages were seen in some birds, probably due to the euthanizing procedure. No other lesions were observed during the experiment.

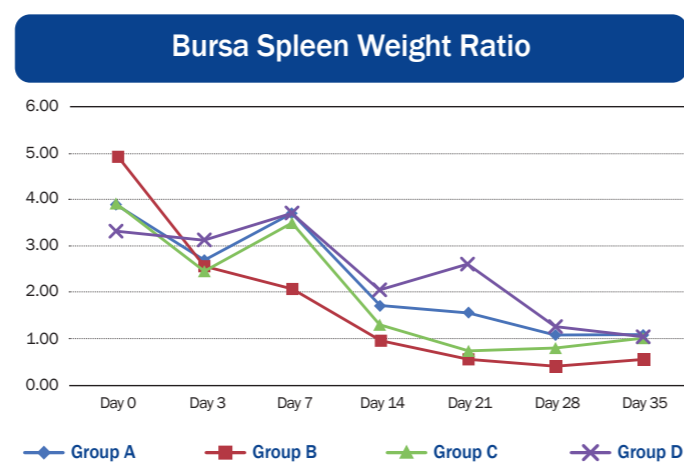
BBW ratio and BSW ratio

The mean BBW and BSW ratio of the vaccinated groups were lower than the mean BBW and BSW of the control group at 14, 21 and 28 days post vaccination. The ratios of the vaccinated group with Hipragumboro[®] GM97 were consistently higher than the other two vaccinated groups.

Graph 1. Means of Bursa - Body Weight ratio.



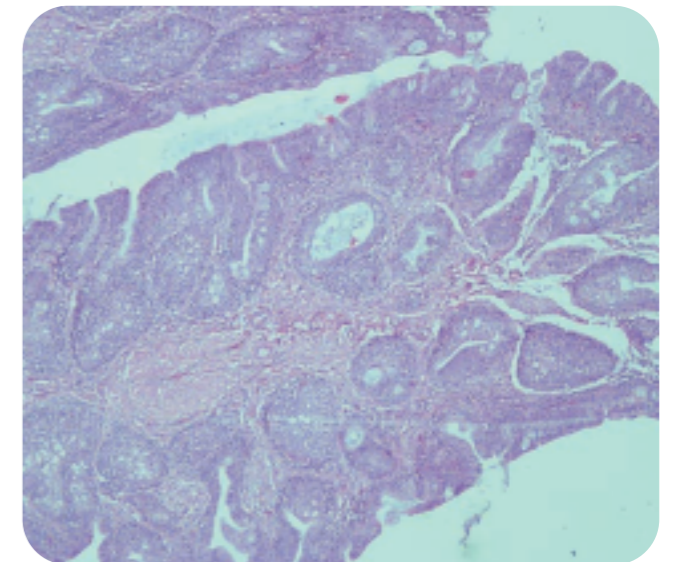
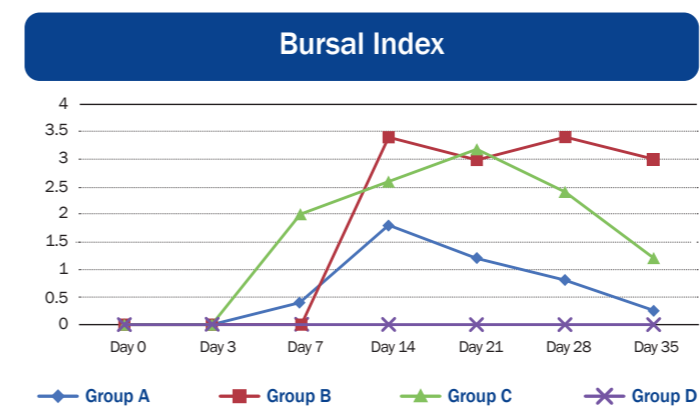
Graph 2. Mean of Bursa Spleen Weight ratio.



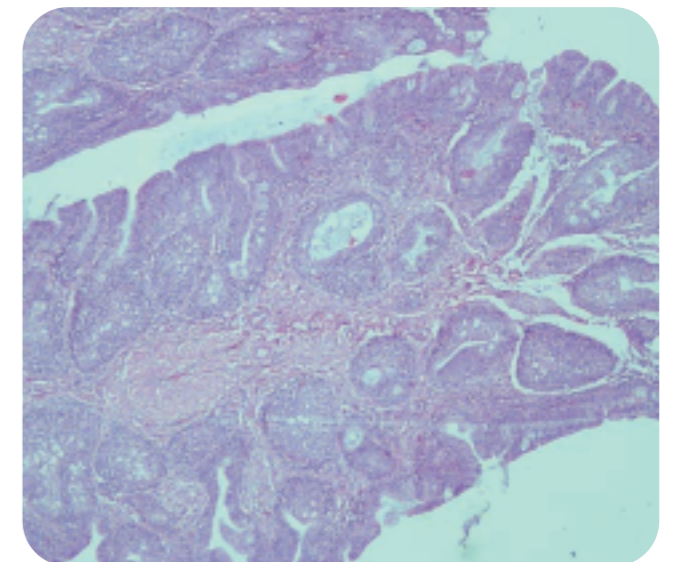
B-cell population of the follicles

The bursas of Fabricius of the animals inoculated with a commercial dose of Hipragumboro[®] GM97 showed a maximum B-cell depletion score of 1.8 at 14 dpv. Group B showed a maximum B-cell depletion score of 3.5 at 14 days post-vaccination. Group C showed a maximum B-cell depletion score of 3.2 at 21 days post-vaccination. The group vaccinated with Hipragumboro[®] GM97 showed a quick recovery of the bursal damage which was almost completed at 35 days post-vaccination.

Graph 3. Bursal Index.

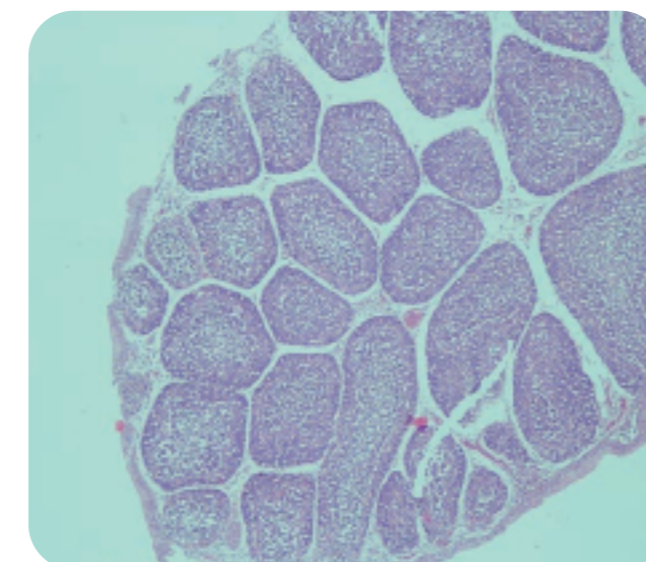


Group B.



Group D, control.

Histopathologic sections of the bursa at 14 days post-vaccination.



Group A, vaccinated with Hipragumboro[®] GM97.

