Efficacy of Hyogen® vaccine in one-shot application under laboratory conditions

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Introduction

Mycoplasma hyopneumoniae (Mh.) is a major contributor to the Porcine Respiratory Disease Complex, causing substantial losses to the swine industry. The pathogen causes damage to the ciliated respiratory epithelium, which induces chronic coughing and reduced performance, as well as inadequate immune response to other respiratory pathogens. Vaccination using adjuvanted bacterin vaccines is one of the efficient ways to control the infection. Vaccination prevents clinical symptoms, lung damage and improves overall performance[1]. HYOGEN® is a bacterin vaccine, adjuvanted with oil in water containing non-toxic purified LPS of J5 *E. coli* mutant strain. This original adjuvant combination helps in boosting both humoral and cell-mediated immune responses. This study was aimed to assess the protection of HYOGEN® vaccine in a single dose given at 3 weeks of age.

Materials and Methods

Forty-two sero-negative weaned piglets were randomly distributed into 3 vaccinated groups (10 pigs each) and a control group (12 pigs). At 3 weeks of age, group 1 was given, 2 ml of HYOGEN® vaccine intramuscularly. Groups 2 and 3, one-shot competitor vaccines were given (Competitor A and Competitor B), according to the manufacturers' recommendations. No vaccine was given to the control pigs (group 4). After 21 days, all pigs were challenged intra-nasally with 10^9 Colour Changing Units/animal of a virulent *M. hyopneumoniae* strain. The animals were observed for 28 days, according to the requirements of the European Pharmacopoeia[2]. For 2 weeks, from the 2nd week after challenge, the animals were observed for respiratory symptoms every 2 days. Rectal temperatures were also recorded. Blood sampling and bodyweight measurements were carried out at the beginning of the experiment, at challenge and at the end of the study. Finally, the animals were euthanized, necropsied and the extent of lung lesions was recorded. For each lobe, a maximum score of 5 was given, according to the affected lobe surface percent, in 20% increments (max=35/lung). Weighted scores per lobe were also applied[2]. The results were analyzed with ANOVA, using Statgraphics Centurion XVI software.

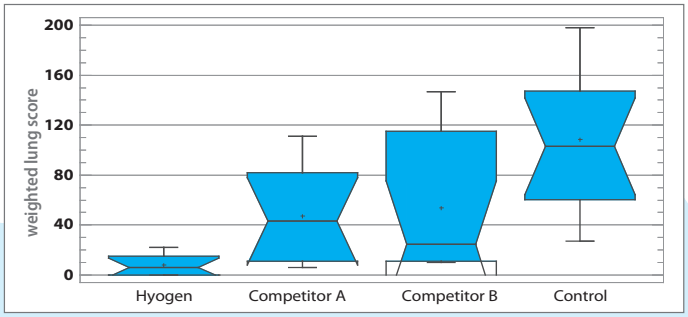
Results

Overall, HYOGEN® induced lower grade of clinical symptoms than the non-vaccinated controls and the competitor vaccines (data not shown). The lung lesion scores showed a statistical significant difference in favor of HYOGEN® (Table 1 and Figure 1).

Table 1 *- Summary of weighted lung lesion score by treatment group*

Group	Mean	Sd	Min	Max	Signifiant difference* (p<5%)
Hyogen	7.9	8.5	0	22	a
Competitor A	47.2	37.3	6	111	b
Competitor B	53.9	56.0	10	147	b
Control	108.4	57.0	27	198	c

Figure 1 *- Distribution of weighted lung scores post-challenge by treatment group (Box-and-whiskers graph showing median)*



Conclusion and Discussion

HYOGEN® showed excellent efficacy in one shot application in reduction of clinical symptoms and lung lesions post challenge. These results indicate that applied in one shot, the vaccine is able to help in controlling the disease under field conditions, by reducing the severity of the clinical symptoms and lung lesions[3].

References

1 - Maes D *et al.*: 2008, Vet Microbiol 126, 297-309
2 - European Pharmacopoeia: 07/2009:2448
3 - Herczeg J *et al.*: APVS, 2011

[1] Ceva-Phylaxia, Budapest, Hungary;
[2] Prophyl Immunolab, Mohács, Hungary;
[3] Ceva Santé Animale, Libourne, France.