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Enzimas Exógenas
Sus efectos
sobre la Nutrición.

Eliminación de
Animales Muertos
Ante Desastres.

¿Podemos Destetar
40 Lechones por
Cerda por Año?

Evaluation of the Efficacy of Viusid Vet Powder is on the Productive and Immunological Parameters in Fattening Pigs



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Background

Pig production in industrialised countries and the third world has changed over the last few years. Large groups of animals are now subject to intensive farming conditions. Pig populations are very dense, which exacerbates the incidence of infectious diseases and promotes contagion within the herds of pigs. As a result of this, the mortality rate increases, weight gain is inadequate, and feed conversion is poor. It takes longer for the pigs to get to the slaughter house and an excessive amount has to be spent on medicine. In practice, this all means that money is lost ⁽⁴⁾.

In Mexico, just like in other countries, infectious diseases are the main cause of death in pigs. The indiscriminate use of antibacterial drugs has promoted the emergence of resistant strains of bacteria as a consequence of the inappropriate use of antibacterials, which in turn favours the transmission and prevalence of infectious diseases.

In view of the aforementioned, one of the alternatives to improve the productive and immunological parameters is to use non-antibiotic immunostimulatory preparations or agents ^(8,13,15) that at the same time improve the productive parameters and the establishment does not have any of the drawbacks involved in antibacterial residues, in terms of recovery time. Such is the case of Viusid Vet Powder, which is a nutritional preparation made of antioxidants, vitamins, trace elements, and an active substance from liquorice root extract (glycyrrhizinic acid), that has powerful antiviral properties.

Accordingly, it was suggested that an efficacy test should be carried out with Viusid Vet Powder in suckling pigs so as to evaluate its effect on the productive parameters and the behaviour of the humoral immune response (production of antibodies) against swine influenza.

Material and methods

The experiment was carried out at the Centre for Teaching, Research, and Extension in Swine Production (CEIEPP), that belongs to the Faculty of Veterinary Medicine and Animal Husbandry of the Universidad Nacional Autónoma de México (UNAM), located in Jilotepec, State of Mexico. A total of 40 newly weaned male and female Duroc-Landrace piglets, weighing approximately 7 kg, were divided into two groups of 20 piglets each one as follows:



VIUSID VET POWDER GROUP: Once the effectiveness of the mixture had been proved, a grain type of feed was prepared on-site at the test farm, which was then administered in different stages. Viusid Vet Powder was added in a ratio of 2 kg/ton of feed throughout the trial.

CONTROL GROUP: The pigs were given the feed that was prepared on-site at the test farm and administered ad libitum in different stages without adding Viusid Vet Powder; from the weaning stage to the growth stage and then during the finishing stage.

Evaluation parameters: Average daily weight gain per group (g), weekly feed consumption (kg), weekly feed conversion ratio per group (kg), and average weekly weight per group (kg).

Serological and RT-PCR tests (Polymerase Chain Reaction).

Monitoring

Haemagglutination-Inhibition test for Swine Influenza (HI-SIV): 20 full blood samples without anticoagulant had to be taken at 7 days and then at the end of the fattening stage to separate the serums and to carry out the haemagglutination-inhibition test against the swine influenza virus per group.

The intention was to corroborate the behaviour of the immune system in terms of producing antibodies against the disease (swine influenza) on the farm.

To determine the antibody titres produced against swine influenza in the serum of each pig, the haemagglutination-inhibition test was used with the reference virus A/swine/New Jersey/11/76 (H1N1) GeneBank access K00992 and

with the subtype A/swine/Minnesota/9088-2/98 (H3N2). Access number to the GeneBank: AF153234.

In order to be able to classify the animals exposed to the swine influenza virus subtypes H1N1 and H3N2 as being positive, a 1:80 dilution or greater was needed, or its corresponding logarithmic expression equal to 1.9 log. The negative animals were identified in accordance with the tests based on the antibody titres located in the dilution 1:40 or less, or a logarithmic expression less than 1.9 log.

REAL-TIME PCR: 20 nasal swab samples were taken per group to carry out the RT-PCR test in real time to evaluate the viral excretion stage. During the second week of the weaning stage, namely on the 8th, 10th, 12th, 14th, 16th, 18th, 20th, and 22nd of May, whereby 8 monitoring sessions were organized for this trial. The animals whose viral load is greater or equal to 2.0 logarithms are considered to be positive animals. The animals whose viral load is less than 2.0 logarithms are considered to be negative animals.

Results

The weekly productive results for the control and Viusid Vet Powder groups (daily weight gain, feed consumption, feed conversion, and weight) are shown in table 1.

TABLE 1. Summary of the productive results per group at 18 weeks:

	DWG (g)	Average Consumption (Kg)	Conversion (Kg)	Average Weight (Kg)
Control	637	1.50	2.24	89.88
Viusid Vet Powder	726	1.71	2.15	103.32
%	+14.0%	+14.0%	-4.0%	+15%

The group given Viusid Vet Powder completed the trial with a better weight gain (14%), greater average feed consumption (14%), lower feed conversion ratio (4%), and higher average weight (15%) than that of the pigs in the control group.

Laboratory analysis (Tables 2, 3, and 4)

In the first monitoring after 15 days of treatment (Table 3), the percentage of positive serum for the Viusid Vet Powder group was less than that of the control group (H1N1: 47.3% Viusid vs. 61.1% Control, and H3N2: 15.8% Viusid vs. 22.2% Control), which implies that the immune system of the pigs treated with Viusid Vet Powder was working better. The immune response of both groups in terms of the amount of antibodies produced was similar. The organism's general defence mechanism of the pigs treated with Viusid Vet Powder helps protect them against infection with swine influenza virus. This explains the lower positivity rates for both subtypes (H1N1 and H3N2).

(lower percentage of positives H1N1 and H3N2), the product is thought to improve the pig's immune system before immunological maturation.

This is in line with the fact that the pigs from the Viusid Vet Powder group had lower titre averages at the end of the trial (more stable immunity).

The results coincide with those obtained from the PCR (Polymerase Chain Reaction) test, given the fact that the group that was not treated with Viusid Vet Powder had more viral circulation and therefore more antibody titres.

Results of the real-time RT-PCR (Polymerase Chain Reaction) test

Table 4 shows the results of the RT-PCR test (Samples (+) >2.0 copies/reaction) obtained from the nasal swab samples taken from both the control and the Viusid Vet Powder groups.

TABLE 2. Haemagglutination-inhibition test for swine influenza virus subtype H1N1

Monitoring	Control Average Log	VIUSID Average Log	Difference	Control Standard Deviation	VIUSID Standard Deviation	Difference	Control % Positives	VIUSID % Positives	Difference
15 days	1.80	1.80	0.00	0.18	0.32	0.14	61.11	47.37	-13.74
120 days	2.16	1.88	-0.28	0.49	0.25	-0.24	86.66	71.43	-15.23
% Group Average	1.98	1.84	-0.14	0.34	0.29	-0.05	73.88%	59.40%	-14.49%

TABLE 3. Haemagglutination-inhibition test for swine influenza virus subtype H3N2

Monitoring	Control Average Log	VIUSID Average Log	Difference	Control Standard Deviation	VIUSID Standard Deviation	Difference	Control % Positives	VIUSID % Positives	Difference
15 days	1.60	1.54	-0.06	0.23	0.27	0.04	22.22	15.79	-6.43
120 days	1.82	1.41	-0.41	0.13	0.25	0.12	73.33	0	-73.33
% Group Average	1.71	1.48	-0.235	0.18	0.26	0.08	47.78%	7.90%	-39.88%

In the second monitoring after 120 days of treatment, the percentage of positive animals that were being administered Viusid Vet Powder was significantly lower (H1N1: 71.4% Viusid vs. 86.6% Control, and H3N2: 0% Viusid vs. 73.3% Control). This means that the pig's organism can react and defend itself better against the swine influenza virus. Infections are less likely to develop and there is less viral elimination.

Moreover, it is believed that more pigs from the control group were infected, which is why they produced more antibody titres against the Swine Influenza virus. Less pigs from the group treated with Viusid Vet Powder were infected and hence, less antibody titres were produced against the Swine Influenza infection subtype (H1N1).

In conclusion, given the serological tests carried out on the Viusid Vet Powder group of pigs produced better results

The percentage of positive animals is less in the group treated with Viusid Vet Powder (20.6%) compared to the group that is not given Viusid Vet Powder (38.1%). This corroborates the results obtained in the haemagglutination-inhibition tests, that show fewer animals infected in the treatment group, lower viral load due to a shorter permanence in the pig's organism, that is, a lower positivity rate and less viral elimination.


In the majority of the monitoring sessions, the viral load is always lower in the treatment group than in the control group, which shows a better general reaction of the pig's organism not to develop a viral infection. This explains why the number of positive pigs exposed to the swine influenza subtype H1N1 is lower in the treatment group.

TABLE 4. Samples (+) >2.0 copies/reaction

Monitoring	Control Average Log	VIUSID Average Log	Difference	Control Standard Deviation	VIUSID Standard Deviation	Difference	Control % Positives	VIUSID % Positives	Difference
1	1.88	1.87	-0.01	0.45	0.63	0.18	35%	25%	-10%
2	1.83	1.58	-0.25	0.31	0.39	0.08	30%	5%	-25%
3	1.66	1.93	0.27	0.36	0.37	0.01	5%	45%	40%
4	2.24	1.85	-0.39	0.42	0.42	0.00	70%	25%	-45%
5	1.92	1.94	0.02	0.30	0.49	0.19	35%	45%	10%
6	1.90	1.64	-0.26	0.33	0.35	0.02	45%	20%	-25%
7	1.79	1.44	-0.35	0.42	0.20	-0.22	35%	0%	-35%
8	1.91	1.44	-0.47	0.42	0.20	-0.22	50%	0%	-50%
% Group Average	1.89	1.71	-0.18	0.38	0.38	0.01	38.13%	20.63%	-17.50%

Conclusions:

- Using Viusid Vet Powder in the pigs' feed during the growth and finishing stages in a dose of 2 kg per ton of feed improved the productive parameters during the 18 weeks of the trial. ● ● ●
- By the 18th week of the fattening stage, Viusid Vet Powder had improved the daily weight gain by 89 grams, the average feed consumption by 210 grams, the feed conversion ratio by an average 90 grams of feed per kg of live weight, and the final average weight by 13.44 kg. ● ● ●
- When Viusid Vet Powder was used as an immunomodulator in the fattening pigs' feed during the growth and finishing stages, the immune system of the pigs improved. This was demonstrated by means of the haemagglutination-inhibition test and the real-time RT-PCR test for the swine influenza virus subtypes H1N1 and H3N2. ● ● ●
- In the treatment group, that was administered 5000 ppm (parts per million) of Viusid Vet Powder, the percentage of positive animals was seen to be much lower, which implies that the product boosts the immune system and allows to better control the infections caused by swine influenza viruses. ● ● ●

Administering Viusid Vet Powder to fattening pigs does not alter their homeostasis or their symptomatology in any way after the product has been used. It does, however, improve the productive expression in strains of high-yield breeds of fattening pigs. 

****Registered trademark. Viusid Vet Powder, Catalysis, Spain.
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