



# LOS Avicultores

Y SU ENTORNO

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**MVZ en los Desastres**  
Importancia de  
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**Diagnóstico de  
Inmunodepresión  
en Aves**

**Futuro de  
Carne de Ave**  
Ante la Globalización



# VIUSID<sup>®</sup>vet

## Being Productive... Through Health.

Catalysis, S.L. is a private and independent laboratory with its own patents that focuses on continuous research and development.



### Our products

All of our products are made in the European Union and are used in more than 80 countries around the world. Our success is thanks to our belief in providing top quality products and promoting ongoing research and development.

This research and development has enabled Catalysis, S.L. to come up with a product that is especially designed to improve productivity on poultry farms.

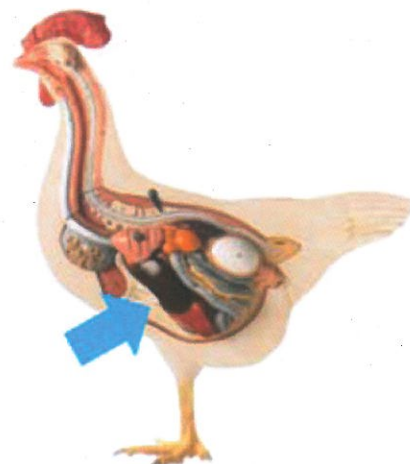
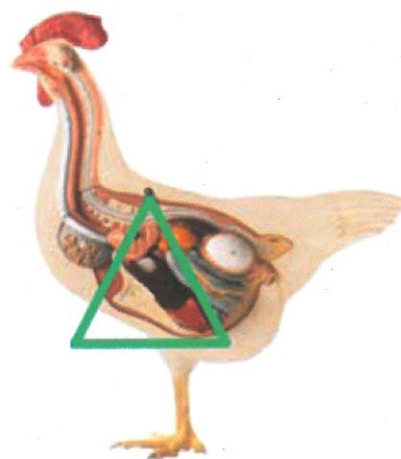
### Rationale

The genetic potential of modern food producing animal breeds requires high energy and protein feed to obtain meat in less time. Antioxidants and hepatoprotective agents are also essential to ensure that the best production characteristics are preserved.

The liver is a multifunctional organ that plays a major role in synthesizing proteins from the amino acids that are absorbed in the intestine. In high productivity strains of poultry, this function of the liver is particularly important; if it deteriorates in any way, the birds' growth and their egg-laying could be affected. It could even affect the immune system's capacity to respond to vaccines and diseases.

Two steps must be taken to preserve liver physiology:

- Avoid excess fat and keep an eye out for any hepatotoxic substances: Micotoxins, free radicals, and other toxins.







- Increase the levels of pyridoxine (B6), pantothenic acid, biotin, myoinositol, choline, and pro-nutrients in the feed.

### What is VIUSID Vet?

VIUSID® Vet is a food supplement made up of antioxidants, vitamins, trace minerals, and liquorice root extract (glycyrrhizinic acid). It is especially designed to build up the immune system. It is therefore perfect to treat diseases that cause immunodeficiency disorders.



It is particularly suitable to be used as an adjuvant therapy in viral and parasitic illnesses and to boost the immune system. It is also a powerful hepatoprotective agent.

Given the fact that it only contains natural ingredients, there are no side effects.



### VIUSID Vet contains

- Liquorice plant root extract from Mediterranean Europe and Asia Minor.
- Antiviral agents such as: Malic acid and glycyrrhizinic acid.
- Antioxidants such as: Malic acid and ascorbic acid.
- Antianemics: Folic acid, cyanocobalamin, and pyridoxine.
- Immunomodulators: Arginine, glycine, glycyrrhizinic acid, calcium pantothenate, and zinc.
- Biocatalytics: Zinc and calcium pantothenate.

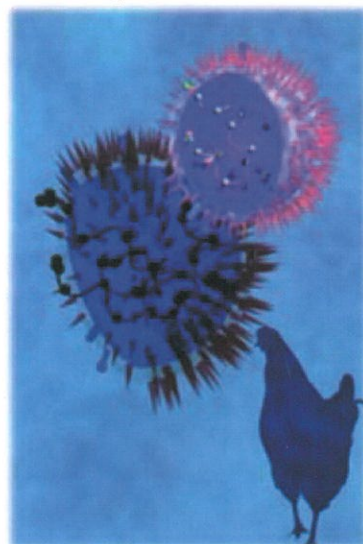
### Therapeutic indications

- Acute and chronic hepatopathy.
- Antiviral action (it stimulates interferons)
- Immunostimulatory effect.
- Anaemia, weakness.
- Immunodepression disorders (Marek's disease, Gumboro disease, anaemia, mycotoxicosis, etc.).
- Severe post-vaccine reactions.



### Mechanism of action

- It re-establishes liver functions and restores the biochemical parameters that indicate liver damage.
- Glycyrrhizinic acid inhibits the protein phosphorylation with Kinase-P, which it binds directly to reduce the Kinase activity. It can interact with the viral structures (proteins) and it has different effects according to the stage of the virus in question.
- The extracellular free virus particles are inactivated. The assembly capacity of the virus deteriorates.
- Arginine (in Marek's disease) makes the thymus bigger and increases the number of T cells; by doing so, it cuts down on infection. It enhances the immune response and the healing of







wounds. It has anti-tumour properties.

- **Pyridoxine:** This is needed to form antibodies and red blood cells. It stimulates the immune response.
- **Folic acid:** Antianemic. It increases the appetite of weakened birds.
- **Glycine:** It stimulates the secretion of glucagon, which is a hormone that facilitates the conversion of glycogen into glucose.
- **Ascorbic acid:** It provides protection against carcinogenic agents. It is an antioxidant and has healing properties. It helps prevent various viral and bacterial infections. It boosts the immune system.

The active ingredients of VIUSID Vet - antiviral agents, amino acids, vitamins, and antioxidants-enhance the biological performance of the organism to obtain better weight, yield, and a healthier bird.

### Proven benefits



In broiler production:

1. Better feed conversion.
2. Better weight gain.
3. Better viability.
4. More cost-effective.
5. Healthier birds.
6. Better quality of chicken.
7. No waste.
8. No resistance is built up.

### Instructions for use

- Broilers on arrival:
- From day 1 to days 28-35 to boost vaccination stage.
- 7 days before and after each treatment or vaccination.
- Critical stages of production, feeding, and treatment.
- Stress due to digestive, respiratory, immunosuppressive infections.
- Caloric stress, severe post-vaccination reactions.

### Dose

- 1 litre of VIUSID® Vet can be used to prepare 1000 L of drinking water.

### Presentation

- Containers with 1, 5, and 25 litres. Ready to be added to the drinking water.



**catalysis**

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# Effect of Glycyrrhizinic Acid *on immune response* *in Commercial Broilers*

## **Abstract**

The manipulation of the immunological system through the inclusion of some immunostimulant could be considered as an alternative to improve poultry production. This preparation (Viusid®), that contains antioxidants, vitamins, trace elements, and glycyrrhizinic acid, has demonstrated in humans, "in vitro" and "in vivo", a potential antiviral activity. It is also capable of stimulating production of gamma interferon. The aim of this study is to establish the efficacy of VIUSID® Vet in commercial broilers evaluating humoral and cellular immune response. A study was conducted on commercial broilers. At 21 and 42 days of age, serum and blood were evaluated. Cellular immune response was evaluated with mediated cutaneous basophilic hypersensitivity by an interdigital skin test.

The groups that were supplemented with glycyrrhizinic acid showed an improvement of the immune response.

In this way, the glycyrrhizinic acid contained in Viusid® Vet can improve all the productive parameters and optimize the immune system of commercial broilers.

## **Introduction**

Nowadays, intensive poultry farming involves taking certain measures to achieve maximum production in the shortest amount of time possible.

These measures include having good biosafety programmes, balanced diets, optimal vaccination schedules, and using growth enhancers and products that improve the immune response (immunomodulators).





Week	VIUSID Weight	CONTROL Weight		VIUSID % C. Mort	CONTROL % C. Mort		VIUSID C. Conv.	CONTROL C. Conv.	
1	0.1475	0.1440	2%	0.67%	0.64%	4%	1.0130	1.0885	-7%
2	0.3075	0.3150	-2%	1.27%	1.18%	8%	1.2490	1.2565	-1%
3	0.6520	0.6310	3%	1.63%	1.90%	-14%	1.4380	1.4815	-3%
4	1.180	1.160	2%	2.45%	3.36%	-27%	1.508	1.660	-9%
5	1.638	1.655	-1%	4.15%	5.74%	-28%	1.636	1.806	-9%
6	2.234	2.205	1%	4.27%	6.98%	-39%	1.738	1.991	-10%
7	2.947	2.905	1%	5.95%	8.17%	-27%	1.940	2.148	-10%

## Material and Methods

60,000 one-day-old birds from the Ross x Ross strain were divided into two groups of 30,000 birds in each group. One of these groups was treated with Viusid® Vet in the ratio of 1 litre of the product per 1000 litres of drinking water throughout the whole production cycle (49 days). The other group, that was not treated, was the control group.

**FEED:** Administered in stages with an automatic feeder.

**TYPE OF WATER DISPENSER:** Cupless nipple drinkers.

**PRODUCT:** Viusid® Vet in 1 litre container.

**DOSAGE:** 1 litre per 1000 litres of drinking water.

**VIUSID VET EVALUATION:** Statistical analysis for weight, feed conversion, and mortality rate.

The test for normality was used for the 3 variables and with the Measurement Analysis of Variance, IBM-SPSS 19 statistical pack, with confidence level  $P < 0.05$ .

### PARAMETERS TO BE ASSESSED WERE:

Viability at 49 days (%).

Weekly weight at 49 days.

Cumulative feed conversion up to 49 days.

### IMMUNOLOGICAL VARIABLES TO BE ASSESSED WERE:

**HUMORAL IMMUNE RESPONSE TEST:** HI (haemagglutination inhibition test).

**CELLULAR IMMUNE RESPONSE:** Delayed-type basophilic hypersensitivity and hemograms.

### HISTOLOGICAL VARIABLES TO BE ASSESSED WERE:

**HISTOPATHOLOGICAL EVALUATION OF LYMPHOID ORGANS:** thymus, spleen, and bursa of Fabricius.

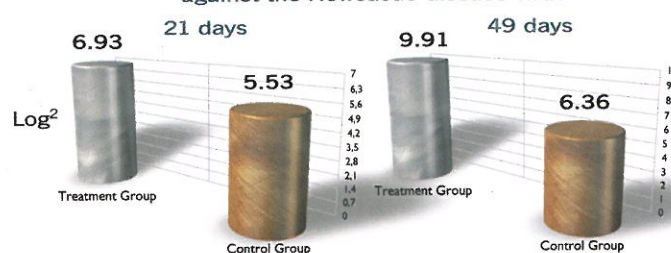
## Results

The glycyrrhizinic acid contained in Viusid® Vet improved the productivity index by 41 points.

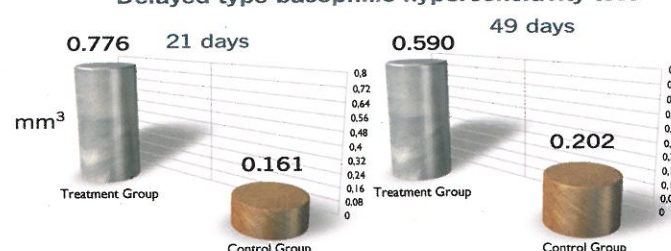
The group treated with VIUSID® Vet had a higher concentration of antibody titres ( $P < 0.05$ ) against the Newcastle

Graphs 1 and 2  
Humoral Immune Response  
(HI ND)

Antibody titres  
against the Newcastle disease virus



Graphs 3 and 4  
Cellular Immune Response  
Delayed-type basophilic hypersensitivity test



Graphs 5 and 6  
Thymus and Spleen Weight Ratio in Percentages



disease virus than the control group, which means that the broilers treated with VIUSID® Vet produced a logarithm with more antibodies than the control group when they were 21 days old. This trend continued onto 49 days old, where the antibody concentration increased in 3 logarithms.

For the cellular response assessed by using the delayed-type basophilic hypersensitivity test in broilers at the start-up stage of the clinical trial, the interdigital



thickness increased ( $P<0.01$ ) in broilers treated with VIUSID® Vet. This implies that the thickness of the interdigital membrane in broilers treated with VIUSID® Vet was 4.8 times thicker than that of the control group at 21 days old. The immunostimulatory effect of VIUSID® Vet continued onto 49 days old.

The results of the studies on the relative weight of the thymus and the spleen increased in the treatment group (VIUSID® Vet), in which there were significant statistical differences ( $P<0.05$ ). This suggests that it has a positive effect whereby the relative weight of these lymphoid organs improves thus making the birds healthier.

### Conclusions

Considering the results obtained in this clinical trial, VIUSID® Vet does act like an immunostimulant as was conclusively proved throughout this study in the humoral immune response evaluation and through the measured protective antibody titres against the Newcastle disease virus.

The cellular immune response (delayed-type basophilic hypersensitivity test) also had significantly positive results, namely, the increase in the thickness of the interdigital membrane of the broilers treated with VIUSID® Vet when they were 23 and 49 days old, which is a sign of an improved immune response. A positive effect was also observed in the preservation of the histological structure of the bursa of Fabricius when the birds were 21 days old and then at 49 days old.

Another important finding is the increase in the relative weight percentage of the lymphoid organs, like the thymus and the spleen, which implies that the birds were healthier.

The product can be used only until the 5th week, as it is assumed that from this time onwards, the immune system had been stimulated enough to be able to complete the whole production cycle without having any infectious problems.

### Implications

1. Glycyrrhizinic acid improves the productive parameters such as the cumulative and weekly weight.
2. Glycyrrhizinic acid improves the cumulative and the weekly feed conversion.
3. Glycyrrhizinic acid improves the productivity index by 41 points compared with the control group that is not given VIUSID® Vet.
4. Glycyrrhizinic acid also had beneficial effects in terms of producing more lymphoid cells and better weight, which could be related to the birds being healthier.
5. With all the benefits obtained in the productive parameters and the effectiveness of preserving and improving the immune response in organs and lymphoid cells, the hypothesis that glycyrrhizinic acid has an immunomodulatory effect on the weekly and cumulative variables of commercial broilers is confirmed.

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