

➔ Feline herpesvirus (FHV-1) is one of the most important causes of respiratory and ocular diseases in cats^{5,9,12}

➔ Following clinical improvement, about 80% of the cats remain carriers of the virus in a latent stage that localises in the trigeminal ganglion, the cornea and the turbinates^{5,12}

➔ Reactivation occurs in 45% of cats with latent viral infection as a result of stress with reappearance of the clinical symptoms⁵

VIRAL REPLICATION

Oral administration of L-lysine, lactoferrin and colostrum interferes with the replicative capacity of the herpesvirus, reduces the occurrence and intensity of symptoms^{4,9,10,12,18,23,31,36,37}.

IMMUNOMODULATION

An **adequate immune response** is needed to improve the clinical symptoms, check bacterial superinfections (*Bordetella bronchiseptica*, *Chlamidophyla felis*, *Mycoplasma felis*) and limit the viral replication at sites of latency^{9,12,18}

HERPLESS plus

✓ New enhanced formula

✓ Highly palatable

✓ Activity proven in vitro

CONTAINS:

L-lysine

Colostrum + lactoferrin

Glycine-chelated zinc

Postbiotics

Medicinal mushrooms (dried)

HERPLESS plus



COMPOSITION: Fungi, dried (Pleurotus ostreatus, Pleurotus eryngii, Lentinula edodes), Yeasts products (Saccharomyces cerevisiae) (Epicor® pets), Maltodextrin, Colostrum powder, Whey protein powder, Whey protein powder (hydrolyzed), Sodium bicarbonate
ADDITIVES PER KG I Nutritional additives: *minoacids: L-lysine monohydrochloride, technically pure 3c322 500,000 mg Trace elements: Zinc chelate of glycine hydrate 3b607 - Zinc 5,200 mg*
Technological additives: *Anti-caking agents: Colloidal silica E 551b 10,000 mg*
ANALYTICAL CONSTITUENTS: Crude protein 41.0% - Crude fibre 0.5% - Crude fat 1.0% - Crude ash 1.0% - Moisture content 2.7%
INSTRUCTION FOR PROPER USE: HERPLESS plus powder is a complementary feed for cats that contains the aminoacid L-lysine. Mix HERPLESS plus powder with moist feed according to the following daily quantity:

Cats < 2,5 kg: 1 level measure (equivalent to 250 mg L-lysine) twice a day

Cats > 2,5 kg: 2 level measures (equivalent to 500 mg L-lysine) twice a day

In case of a diet based only on dry feed: slightly moisten the feed to ensure good adhesion of the powder and its complete intake.

The minimum storage life means the period during which, under proper storage conditions the feed retains its properties. Keep the pot closed after use. Keep in a dry place and protect from sunlight and heat sources before and after opening.

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HERPLESS FACILE plus

COMPOSITION: Micronized poultry meal, Glycerine, Pregelatinized rice starch, Animal by-products (Pork), Fungi, dried (Pleurotus ostreatus, Pleurotus eryngii, Lentinula edodes), Yeasts products (Saccharomyces cerevisiae) (Epicor® pets), Glucose syrup, Colostrum powder, Whey protein powder, Whey protein powder (hydrolyzed), Sodium chloride.

ADDITIVES PER KG I Nutritional additives: *Aminoacids: L-lysine monohydrochloride, technically pure 3c322 250,000 mg Trace elements: 3b607 Zinc chelate of glycine hydratehydrate 3b607 - Zinc 5,200 mg*

Technological additives: *preservatives and antioxidants*

ANALYTICAL CONSTITUENTS: Crude protein 45.3% - Crude fibre 0.6% - Crude fat 8.0% - Crude ash 7.2% - Moisture content 14.7% Metabolizable energy: 344.6 kcal/100 g

INSTRUCTION FOR PROPER USE:

Cats < 2,5 kg: 1 chew daily (containing 500 mg of L-lysine)

Cats > 2,5 kg: 2 chews daily (containing 1000 mg of L-lysine)

Give water for drink to the animals.

Keep out of reach of children and pets – keep in a dry place and protect it from sunlight – not for human consumption – keep closed after opening.

Bibliografia

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HERPLESS plus

Contains L-lysine and colostrum

Cat complementary feed

ENHANCED FORMULA



Candioli
 PHARMA

HERPLESS plus

For viral replication

L-LYSINE

Administration of L-lysine improves the symptomatology associated with infection from FHV 1^{9,12,23,31} and the reactivation of latent infections^{9,12,36}.

The recommended dose of L-lysine is 500 mg BID^{12,18}, and it is advisable to administer it as early as possible in acute infections or before stressful events^{9,12,15,23}.

The suppression of viral replication following oral administration of L-lysine can be explained through three mechanisms^{18,31}:

1. It replaces arginine in viral protein synthesis, acting as an antimetabolite
2. It competitively inhibits the arginine transport system
3. It induces the activity of arginase, an enzyme that causes the catabolic degradation of arginine

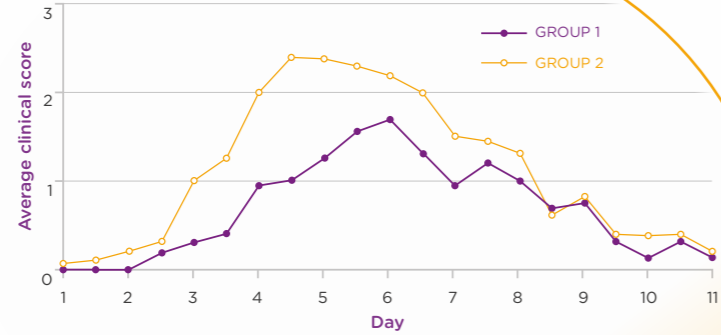
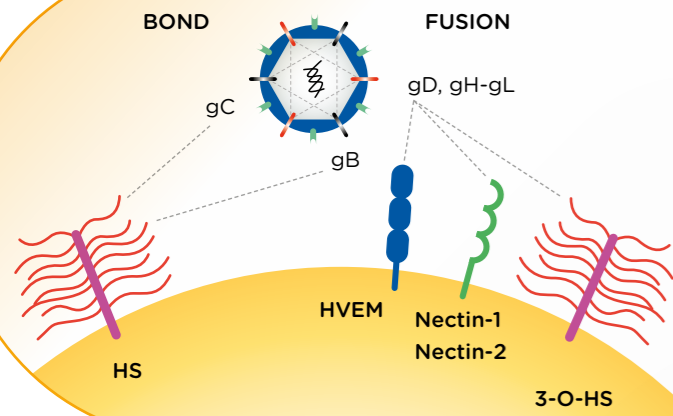


FIGURE 1 - Mean clinical scores (scale 0 to 3) for feline herpesvirus-induced conjunctivitis in cats that received oral administration of 500 mg L-lysine twice daily (group 1) or 500 mg placebo twice daily (group 2). The scores were significantly ($P < 0.001$) different between the groups from day 5 to day 15.

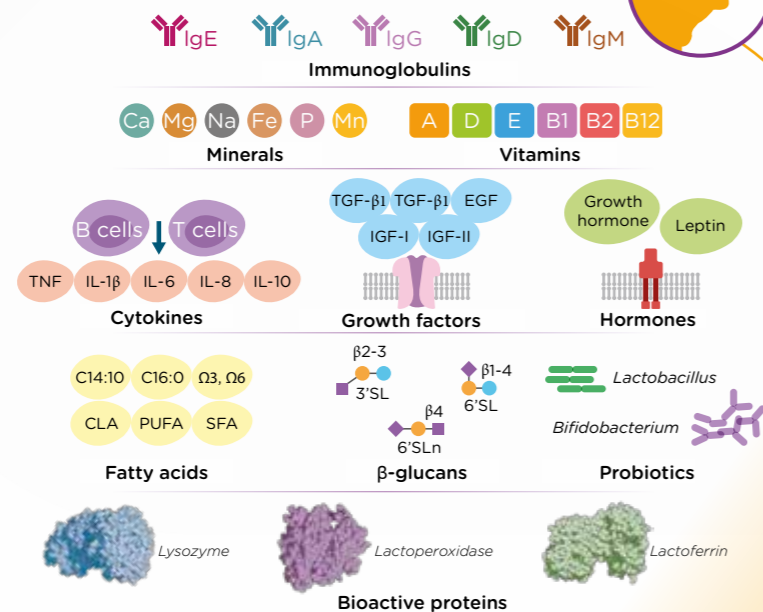
LACTOFERRIN

Exerts an inhibitory effect on the viral replication of Feline (FHV-1)⁴, Human (HSV-1)^{10,14} and Canine (CHV) herpesvirus³³ by modifying adhesion and penetration of the virus within the cells¹⁴. Its antiviral action takes place through an increase in macrophage phagocytosis and interfering with the activated Toll-like receptors during viral infection¹⁴.



BOVINE COLOSTRUM

Contains high concentrations of bioactive compounds, in particular immunoglobulins, growth factors, enzymes (lactoperoxidase, lysozyme) and lactoferrin, useful for stimulating the immune function³⁷. Its effects have been proven especially against viral infections, in humans^{17,24}, dogs^{17,30}, cats¹⁷, horses^{8,17} and other animal species¹⁷. The bovine colostrum used in Herpless Plus has a minimum content of 25% immunoglobulin G (data on file).



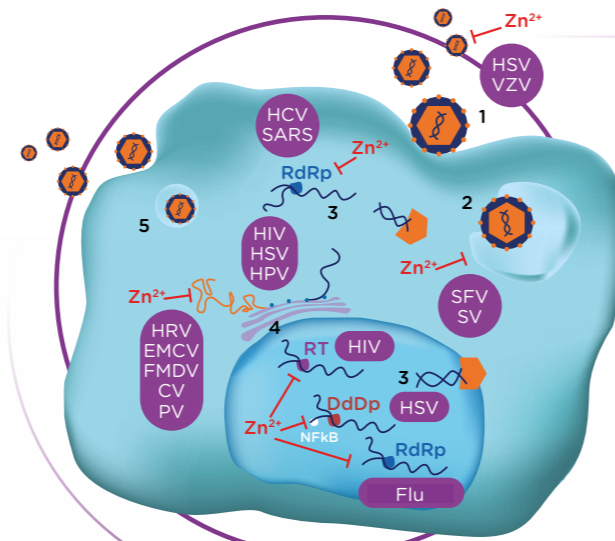
HERPLESS plus

For immunomodulation

ZINC

Zinc is a trace element that plays a key role in the regulation of the innate and adaptive immune system^{6,19,21,22}, maintaining a proper balance between pro- and anti-inflammatory effects through different mechanisms^{6,21,22} and reducing oxidative stress^{6,21,22}.

Its efficacy has been proven particularly in respiratory infections of viral origin, in both prevention and treatment^{21,22}.



The effects of zinc have been studied in particular on human herpesviruses HSV-1 and HSV-2, where it has inhibitory effects on almost all vital phases of the virus's life cycle²⁵.

FIGURE 2 - The different phases of viral replication cycles that are inhibited by zinc. In vitro studies have shown a number of mechanisms by which zinc interferes with the viral replication cycle. These include the inactivation of the free virus (1), the inhibition of viral uncoating (2), the transcription of the viral genome (3) and the translation of viral proteins and the processing of polyproteins (4). No study to date, however, has shown zinc-mediated inhibition of the assembly of the virus's proteins and/or particle release. CV: coronavirus; DdP: DNA-dependent DNA polymerase; EMCV: encephalomyocarditis virus; FMDV: foot-and-mouth disease virus; HCV: hepatitis C virus; HIV: human immunodeficiency virus; HPV: human papilloma virus; HRV: human rhinovirus; HSV: herpes simplex virus; VZV: varicella-zoster virus; RT: reverse transcriptase; SARS: severe acute respiratory syndrome coronavirus; SFV: Semliki forest virus; SV: sindbis virus; VZV: varicella-zoster virus; Zn: zinc.

(mod. from Read et al., 2019)

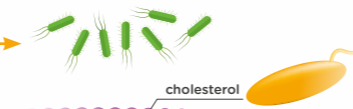
POSTBIOTICS From Saccharomyces cerevisiae

Postbiotics are mixtures of inactivated microorganisms and/or their components capable of conferring various beneficial effects on the body^{27,34,39,41}.

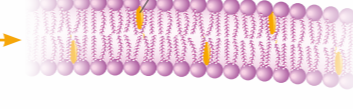
Immunomodulation



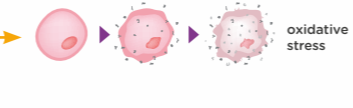
Prevention of infections



Lipid/cholesterol metabolism



Anti-tumour/anti-oxidant activity



Beneficial effects induced by postbiotics (mod. by Zolckiewicz et al., 2020)

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MEDICINAL MUSHROOMS (DRIED)

Pleurotus ostreatus^{2,11,20,28,35,38}

Pleurotus eryngii^{2,32,40}

Lentinus edodes^{11,20,21,26,29,38}

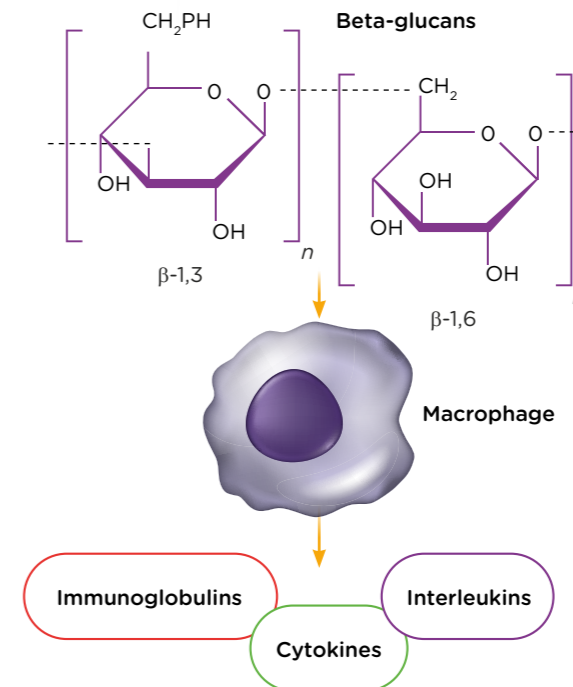
They contain several bioactive substances with antioxidant and antimicrobial action^{2,7,11,13,20,26,28,29,32,36}.

Polysaccharides

Triterpenes

Proteins

Immunomodulatory compounds (β-glucans)



Beta-glucans activate macrophages and release various immunoglobulins, interleukins and cytokines to defend the host against various pathogenic conditions.

Beta-glucans

Gut microbiota

1. Change in bacterial biomass
2. Formation of the active metabolite from beta glucans (SCFA)

Enhanced immune response

FIGURE 3 - Possible mechanism of action of the immunomodulatory activity of β-glucans through the gut microbiota (mod. from Jayachandran et al., 2018)

PROVEN ANTIVIRAL EFFECT

On human HSV-129,35 and bovine BoHV-126 herpesvirus

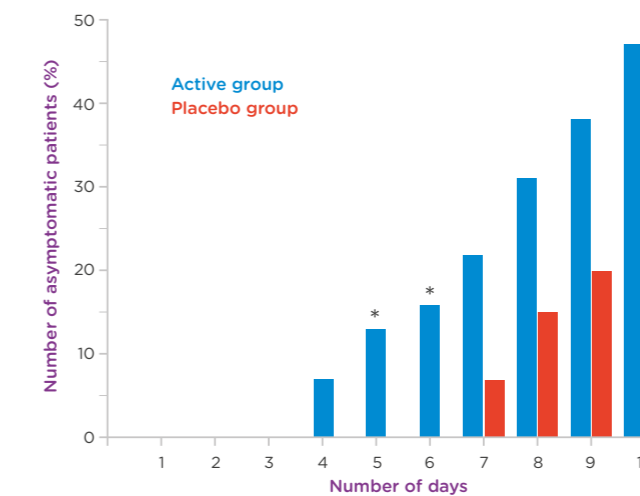


FIGURE 4 - In the number of patients compared to the placebo group. The data represent average values.

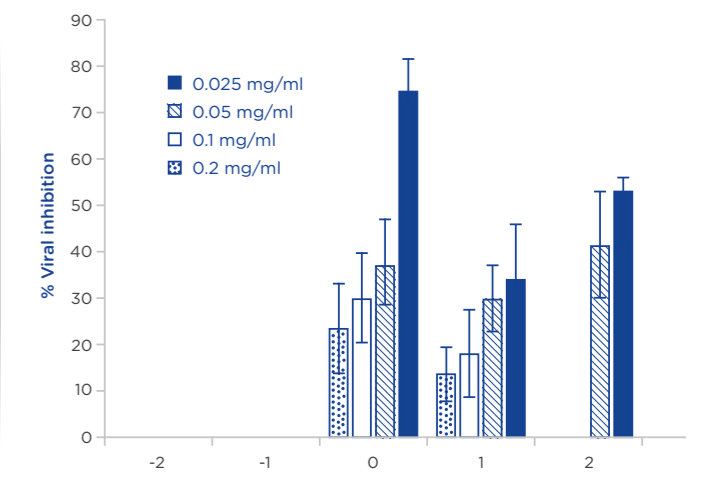


FIGURE 5 - Effect of Lentinus edodes polysaccharide (Lep) on Bovine Herpesvirus replication, monitored by plaque reduction assays in Hep-2 cells (mod. from Rincão et al., 2012)