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OPTISHIELD™ FACTS

- New research shows that Optishield's unique monoglycerides are at least 20 times more potent against the ASF virus than free, or activated, medium-chain fatty acids.
- Delivers a 90% reduction in infective ASF virus in feed within 30 minutes.
- Helps reduce inflammation which can foster viral spread.

► Product Description:

Optishield is a unique combination of monoglycerides, surfactants and immune-supporting oligosaccharides. Monoglycerides and saponin surfactants are well-documented to have antiviral and anti-inflammatory activity. We added the immune support from oligosaccharides to make Optishield a key part of your biosecurity program.

► Modes of Action:

Medium-chain fatty acids (MCFA) are widely recognized as natural compounds that can reduce the risk of viral infection in feed and have activity against pathogenic microbes. The monoglyceride form of medium-chain fatty acids has much greater potency than the free fatty acid form. Published literature and our previous work have demonstrated that glycerol monolaurate (GML) has strong antiviral and antimicrobial properties and documented anti-inflammatory activity.

In pathogenic microbes, these lipids act at the level of the cell membrane in several ways:

1. disrupt the electron transport chain and uncoupling oxidative phosphorylation, both of which will rob the pathogen of energy to metabolize;
2. increase membrane permeability and leakage, resulting in cell death; and
3. disrupt membrane enzyme activity necessary for survival.

These compounds have also been shown to have antiviral activity, most specifically against viruses that possess a lipid-membraned envelope such as Porcine Epidemic Diarrhea virus (PEDv) and Porcine Reproductive and Respiratory Syndrome virus (PRRSv). Disruption of the virus' lipid membrane can be directly virucidal, or may disrupt the virus' ability to fuse with or enter host cells.

Figure 1, at left, from work completed at Cornell University, demonstrates the efficacy of GML against Porcine Epidemic Diarrhea virus (PEDv) and Porcine Respiratory and Reproductive Syndrome virus (PRRSv) *in vitro*. At 250 uM, GML completely eliminated viable virus. Figure 2 features work completed with the National Academy of Sciences in Armenia. It represents the reduction in recoverable African Swine Fever virus (ASFv) from feed after only one hour of incubation with Optishield components, or Optishield at a low inclusion rate. Optishield, at 0.5% in feed, led to a 62.9% reduction in recoverable ASFv.

Figure 1. Effects of GML on PRRSv and PEDv *In Vitro*

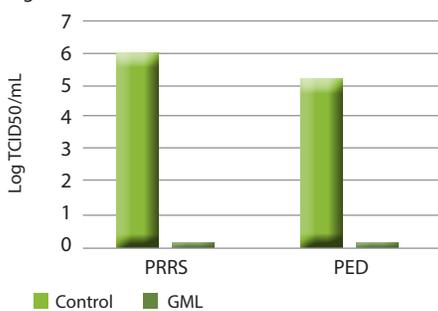
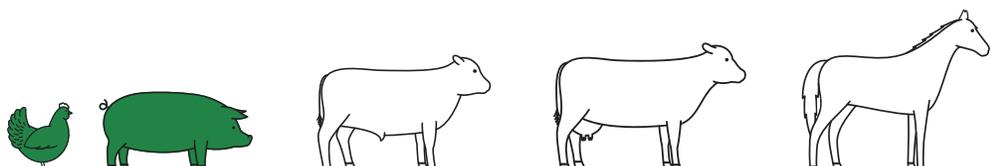
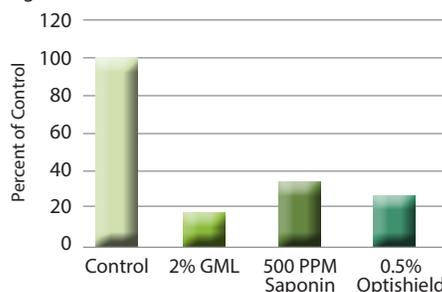


Figure 2. Recoverable ASF in Feed



To learn more, visit naturalbiologics.com or 844.NAT.BIOL (628.2465)



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OPTISHIELD™

Product Description: Optishield is a 100% natural formulation of bioactive compounds which reduce viral and pathogen loads, decrease inflammation and enhance innate and adaptive immune responses.

► **Ingredients:**

Vegetable oil, *Yucca schidigera* extract, plant protein product and yeast extract.

► **Purpose:**

Optishield is to be used as a supplement to complete diets for all phases of poultry and swine diets.

► **Suggested Feeding Directions:**

Follow the directions provided by your nutritional consultant, or:



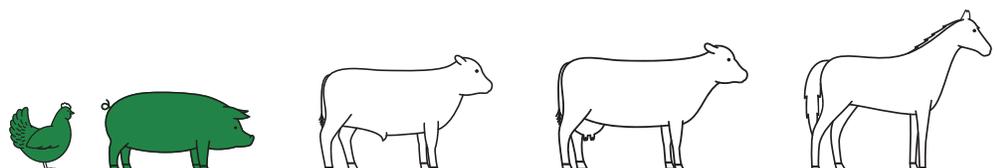
| Swine: | |
|-----------------|-----------|
| All phases | 1-5 kg/MT |
| Phase dependent | |

| Poultry: | |
|-----------------|-----------|
| All phases | 1-5 kg/MT |
| Phase dependent | |

| Guaranteed Analysis: | |
|-------------------------|-----|
| Crude Protein (Minimum) | 3% |
| Crude Fat (Minimum) | 70% |
| Moisture (Maximum) | 10% |
| Ash (Maximum) | 4% |

**Optishield can help control viral load in feed and inside your pigs.
Visit naturalbiologics.com today.**

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