

LYSOFORTE® Extend

A Natural Emulsifier to Enhance Lipid Digestibility



LYSOFORTE® Extend

Improve feed efficiency and maximize profitability

Feed represents 60-70% of the total cost of swine production and is critical to a producer's bottom line. It can be a balancing act to find ways to maximize efficiency or reduce input costs while still meeting the nutritional requirements for optimal animal performance. One way to address this balancing act is to include an emulsifier in the diet. LYSOFORTE Extend — a synergistic combination of lysophospholipids, monoglycerides, and synthetic emulsifier — is designed to enhance digestion and absorption of energy-rich ingredients, including fats, oils, and fat-soluble nutrients in swine diets.

SWINE PRODUCERS CAN BENEFIT FROM LYSOFORTE EXTEND

LYSOFORTE Extend is the next generation of LYSOFORTE. It optimizes the use of fat in the diet by supporting digestion and absorption. This allows you to optimize efficiency in your current ration or support animal performance in a reduced energy, lower-cost diet.

These benefits are possible through:

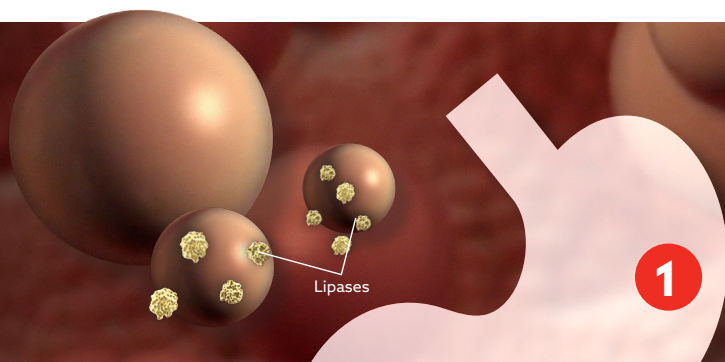
- Supports fat emulsification and utilization
- Enhances nutrient absorption
- Improves feed efficiency
- Better feed cost control

Mode of action

By understanding the mode of action of an ingredient, one can better predict how the animal will respond once it is fed. LYSOFORTE Extend features a three-step mode of action that enhances digestion and absorption of energy and nutrients in feed.

Step 1: Emulsification

In the stomach, lysophospholipids (LPLs) interact with fatty acids, fat-soluble nutrients, and natural emulsifiers to **form stable oil-in-water emulsions. Smaller fat droplets have more surface area for fat-digesting enzymes — lipases — to interact.**



Step 2: Hydrolysis

In the small intestine, **lipases break fat droplets into free fatty acids and monoglycerides.** Fat droplets with LPLs are smaller, resulting in **faster hydrolysis, improved fat digestion, and efficient micelle formation.**



Step 3: Nutrient absorption

LPLs support efficient formation of nutrient-rich mixed micelles. These micelles incorporate into the small intestinal cell wall, enabling **efficient absorption of dietary energy and fat-soluble nutrients to support animal performance and health.**



How LYISOFORTE Extend can benefit your operation



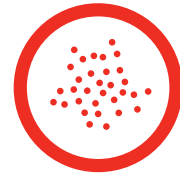
Supports growth performance and feed efficiency^{1,2}



Aids in nutrient digestion for young animals



Positively impacts gut morphology and intestinal integrity³



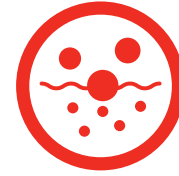
Available in a dry, heat-stable form suitable for pelleting



Contains lysophospholipids that help improve fat and fat-soluble nutrient digestion and absorption^{1,4}



May be used to replace high-energy ingredients, like fats and oils, in diets for feed cost savings



Supports absorption of fat-soluble vitamins and carotenoids

Two ways to use LYISOFORTE Extend

Efficient and easy to incorporate in premix, concentrates, or complete feeds, LYISOFORTE Extend can be used in two ways:

1

Diets can be reformulated to use LYISOFORTE Extend to save on feed costs by reducing the inclusion of dietary fat.

OR

2

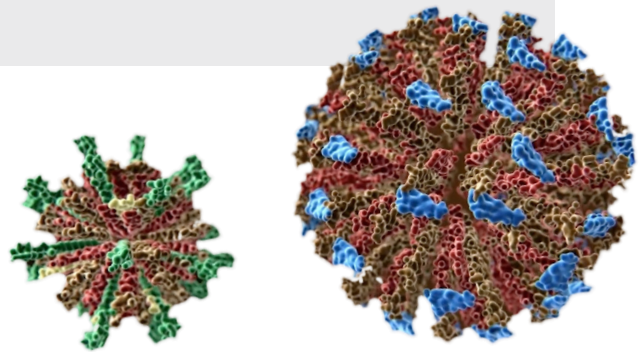
LYISOFORTE Extend can be added to existing diets, commonly referred to as "on top" of the formulation to improve nutrient absorption.

RECOMMENDED APPLICATION RATES IN FEED

- **Swine:** 0.5 - 1.5 lbs/ton of feed

DIVE DEEPER — LYISOFORTE LPLs

The primary active ingredient in LYISOFORTE Extend is lysolecithin. Lysolecithin is produced using an enzymatic process where phospholipids (PLs) in soy lecithin are converted into LPLs.⁵ LPLs have increased hydrophilicity and are more fluid than PLs, which improves their capacity to support formation of oil-in-water emulsions. The LPLs in LYISOFORTE Extend have unique physical and chemical properties, which enhance nutrient absorption and improve feed efficiency in multiple species.

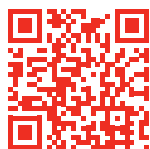


LPLs (left, green) support formation of smaller, more stable micelles, better emulsification, and better absorption than phospholipids (right, blue).

REFERENCES

1. Wealleans, A.L., et al. (2020). The addition of lysolecithin to broiler diets improves growth performance across fat levels and sources: a meta-analysis of 33 trials. *British Poultry Science*, 61: 51-56.
2. Supplementation of lactating sow diets with LYISOFORTE® improves sow condition, litter growth and uniformity, and piglet livability. TL-18-00029.
3. Brautigan, D.L. et al. (2017). Lysolecithin as feed additive enhances collagen expression and villus length in the jejunum of broiler chickens. *Poultry Science*, 96: 2889-2898.
4. Wealleans, A.L., et al. (2021). Fats and oils in pig nutrition: Factors affecting digestion and utilization. *Animal Feed Science and Technology*, 277: 114950.
5. Joshi, A., Paratkar, S.G. and Thorat, B.N. (2006). Modification of lecithin by physical, chemical and enzymatic methods. *European Journal of Lipid Science and Technology*. 108:363-373.

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