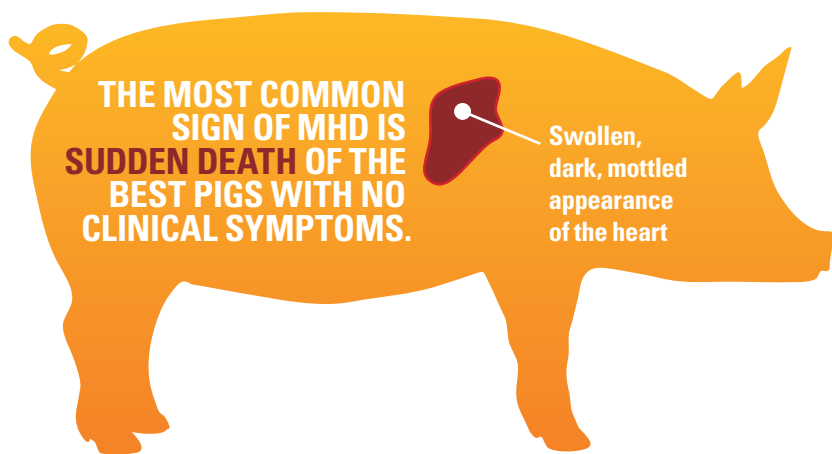


# MULBERRY HEART DISEASE IN PIGS



Often associated with vitamin E and/or selenium deficiency, **Mulberry Heart Disease (MHD) strikes without warning**, resulting in sudden death in rapidly growing weaner and grower pigs without any prior clinical symptoms.

**Vitamin E and selenium are antioxidant molecules which function to protect muscle tissues from oxidative damage.** However, when pigs lack sufficient levels of these molecules, toxic oxidation products — like free radicals and hydrogen peroxide — can build-up in heart muscle tissue. These harmful molecules can then destroy metabolic pathways in healthy heart tissue, leading to heart lesions, myocardial failure and ultimately, death.



**MHD often occurs when there's a one-two punch to the gut's vitamin E supply: high levels of polyunsaturated fatty acids (PUFAs) and mycotoxins in feed.**

PUFAs are highly susceptible to oxidation, which results in production of free radicals that can destroy vitamin E. Concurrently, mycotoxins can damage the intestinal barrier, resulting in decreased vitamin E and selenium bioavailability.

Bottom line — **when intestinal integrity is compromised, pigs have reduced levels of key antioxidants** (vitamin E and selenium) available to protect the heart muscle from oxidative damage.

## CAUSES

- Vitamin E and selenium deficiency
- Diet high in unsaturated fat (PUFAs) or oxidized fat
- Contaminated wet-stored grains (mycotoxins)
- Vitamin A deficiency
- Rapid growth
- High stocking densities
- Heredity

MHD IS OFTEN ASSOCIATED WITH **VITAMIN E AND/OR SELENIUM DEFICIENCY**

## SYMPTOMS

- Pale color
- Lack of appetite
- Muscle weakness, tremor or stiffness
- Lethargy and depression
- Lower body temperature
- Increased levels of associated disease

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**POST-WEANING MORTALITY CAN REACH**

**4%**  
OF PRODUCTION

**INCREASING THE COST OF PRODUCTION BY**

**\$1.68 PER PIG**

## POST-MORTEM SIGNS:

- Large amounts of fluid around the heart and lungs
- Fluid in the abdomen
- Hemorrhagic and pale areas in heart muscle (heart lesions)
- Pale lumber and hind muscles (necrosis)
- Enlarged and mottled liver

## PREVENTION:

Mitigating MHD requires more than a one-and-done solution — it takes a multi-step approach to clean up feed prior to consumption.

- 1 Research ingredients** — Check levels of vitamin E, selenium and vitamin A in feed. Evaluate incoming fat quality to ensure fats are not oxidized. Consider reducing the level of added polyunsaturated fats in the diet formulation.
- 2 Inhibit oxidation** — Add antioxidants and organic acids to the feed or vitamin premix to support the vitamin E antioxidant system and minimize oxidation of PUFAs and vitamins.
- 3 Reduce mycotoxins** — Improve nutrient absorption in the gut by supplementing feed with mineral flow agents that hinder mycotoxins, as well as nutritional emulsifiers that increase vitamin uptake in the intestine.

## TREATMENT

- Increase level of vitamin E in diet to 2-3 times higher than normal levels.
- Use multi-vitamins that include vitamin E and/or selenium.
- Inject pigs with vitamin E/ selenium or use water soluble preparation.
- Move individual pigs to hospital pens for treatment.

# GUT HEALTH TRIPLE CHECK

The Kemin Gut Health Triple Check program helps establish intestinal integrity and protection. Kemin offers products that CLEAN UP contaminants in feed and water prior to animal exposure, BUILD UP intestinal strength and immunity to reduce leaky gut and KNOCK OUT harmful pathogens for healthier and better performing swine. These products are used to help producers target profit-robbing contaminants and support optimal nutrient absorption:

### RENDOX®

Liquid antioxidants to prevent oxidation of dietary-added PUFA fats, like distillers corn oil

### ENDOX®

Synergistic blend of dry antioxidants added to feed/vitamin premix to reduce oxidation of vitamins

### KALLSIL™

Enhanced zeolite mineral-based flow agent used to reduce (or neutralize) naturally-occurring fungal metabolites

### LYSOFORTE®

Nutritional emulsifier/fat-absorption enhancer to improve uptake of fats and fat-soluble vitamins

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