



Oxidation is an irreversible chemical chain reaction in which oxygen combines with fat to cause the fat to become rancid. Fatty acids are attacked by free radicals, oxygen is absorbed and the fatty acids are converted into byproducts like peroxides and aldehydes. Oxidation is initiated by exposure to oxygen, enzymes, metal ions (especially iron and copper), heat and light.

Rancid fat means *quality* has been compromised:

- Fat soluble vitamins may be destroyed
- Digestibility of fat may be reduced
- Aldehydes reduce palatability and intake
- Toxic compounds may reduce productivity

Antioxidants stabilize fat and maintain fat quality by delaying oxidation. Antioxidants accomplish this by sacrificing themselves to quench the free radicals before the fat or vitamin molecules can be attacked.

FEED DESCRIPTION	RELATIVE FEED AGE*	PEROXIDE VALUES
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INGREDIENTS

meq/kg

Cracked corn		3.1
Milo flake		8.0
Ensiled corn		3.5
Finisher supplement		22.9
Starter supplment		12.1
Wheat flakes		6.2
Fat sample 2		1.0
Fat sample		2.4

The data indicates there was a not significant peroxide problem in any of the individual ingredients with the exception of the supplement. It is especially noteworthy the fat was of good quality.

FEED*

High fat feed	Fresh	6.9
High fat feed	Fresh	15.2
High fat feed	Unknown	47.3
High fat feed	Unknown	26.0
Intermediate fat feed	Unknown	15.4
Intermediate fat feed	Unknown	12.2
High fat feed	Old	90.2
High fat feed	Old	68.5
Sick pen feed	Unknown	60.0

When the ingredients were combined, oxidation began immediately. Further data, not shown, indicated the problem increased exponentially when the feed was actually placed in the bunk.



Your investment

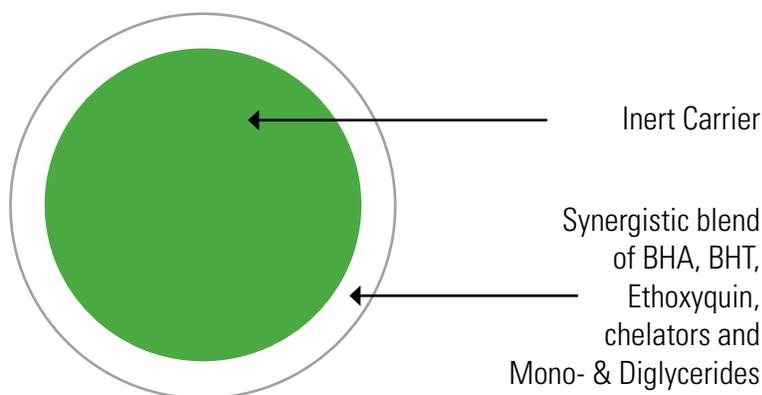
- Approximately \$75,000 in a mixer wagon.
- TMR per ton costs \$280 - \$300 in 2011.
- TMR per ton costs \$320 - \$350 in 2012 - **an increase of 14%.**

Protect your investment

- ENDOX® Dry at \$2.10/lb. used at a rate of ¼ lb. per ton.
- 10 ton batch equals \$5.25 per mixer full. (\$0.53 per ton or 0.15% of the TMR cost per ton).

***If the value of your house went up 14%,
would you spend 0.15% to ensure 100% protection?***

Why is ENDOX the product of choice?



A PARTICLE OF ENDOX® DRY

ENDOX® is a combination of inert carrier that has been coated with a synergistic blend of BHA, BHT, ethoxyquin, phosphoric acid and EDTA. In addition, mono- and diglycerides were added to act as surfactants within the antioxidant system. This combination provides adequate distribution of the active components throughout your feed mixture.

Ask your Kemin representative about ENDOX® or one of our other antioxidant products best suited to your feedstuff, storage conditions and manufacturing process. With 50 years of research and experience in the animal feed industry, Kemin provides you proven products, technical expertise and laboratory support.



INSPIRED MOLECULAR SOLUTIONS™



2100 Maury St.
Des Moines, IA 50317
tel: +1.515.559.5100
fax: +1.515.559.5232