

Manage Vitamin Cost Through Preservation

Involved in over 30 metabolic reactions, vitamins are essential for animal growth, health, reproduction and performance.¹ The susceptibility of destruction to different vitamins can vary considerably. Factors affecting vitamin stability include temperature, oxygen, light, catalysts and time, to name a few.

Premix composition, including the presence of inorganic trace minerals such as Fe, Cu, etc., can have an aggressive effect on vitamin degradation. Vitamin A, one of the least stable vitamins, and Vitamin E are both strongly impacted by several environmental factors.

Table 1. External factors influencing vitamin stability.²

Vitamin	Temperature	Oxygen	Humidity	Light
A	XX	XX	X	XX
D ₃	X	XX	X	X
E	X	0	X	X
K ₃	X	X	XX	X
Thiamin (B ₁)	X	X	X	X
Riboflavin (B ₂)	0	0	X	X
Pyridoxine (B ₆)	XX	0	X	X
B ₁₂	X	X	X	0
Calcium pantothenate	X	0	X	0
Nicotinic acid	0	0	0	0
Biotin	0	0	X	X
Folic acid	XX	0	X	XX
C	0	XX	XX	0
0 stable X slightly sensitive to sensitive XX very sensitive				

In one month's time, vitamin retention in feed typically decreases 2-4 percent. However, this loss can be higher depending on the vitamin product form or relative humidity.

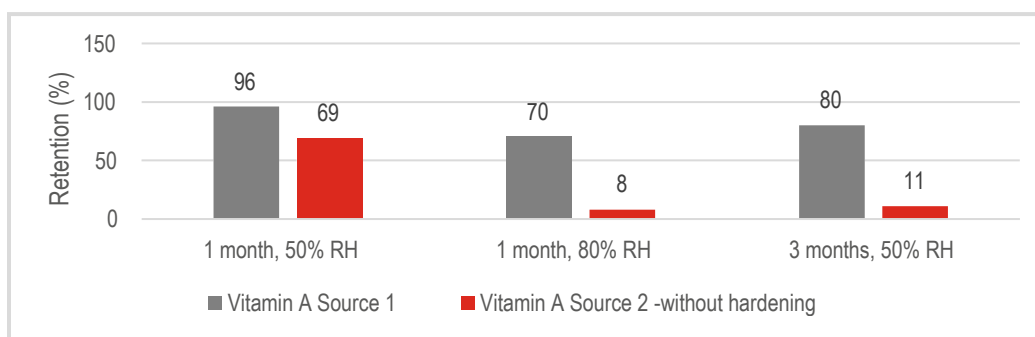


Figure 1. Stability of two Vitamin A sources in a concentrated premix depending on storage time and relative humidity (RH).³



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Preserve Your Vitamins with ENDOX®

Preservation of vitamins in the feed matrix can be accomplished through the addition of an antioxidant. For the best vitamin protection, an antioxidant system which includes a blend of oxygen and free radical scavenging antioxidants and metal chelators, should be used. Traditional single dry antioxidants only concentrate on the free radicals, and do not include oxygen scavengers or metal chelators.

Improve Vitamin A retention within your vitamin/mineral premix with ENDOX. A study comparing the efficacy of ENDOX (125 ppm) at retaining Vitamin A in a vitamin/mineral premix showed ENDOX retained 30% more Vitamin A as compared to the untreated vitamin/mineral premix.

Table 2. Vitamin A loss as effected by antioxidants.⁴

Time (Days)	Control	ENDOX®
60	52%	28%
90	64%	34%

Incorporating ENDOX in your premix helps:

- Safeguard fat soluble vitamins against degradation
- Protect complete feeds from fat oxidation and vitamin loss
- Reduce energy loss due to oxidation of fat in feed
- Protect gut health by limiting toxic compounds created through oxidation

ENDOX – The Right Choice

ENDOX, developed specifically for the treatment of complete feeds and premixes, includes the following:

- A combination of an inert carrier that has been coated with a synergistic blend of synthetic antioxidants and a metal chelator
- Small particle size allowing for homogeneous distribution of the antioxidant throughout the premix and finished feed
- Increased active surface area allowing for every particle to be active and more effective at sequestering free radicals

Product	Active Ingredients	Standard Inclusion Rate*
ENDOX® Dry	EQ, BHA, BHT and Citric	125 grams per tonne of finished feed

1. Marks, J., 1979. A guide to the vitamins: their role in health and disease. Published by MTP, Medical and Technical Publishing Co., Ltd., England.

2. Gadiant, M. 1986. Effect of pelleting on nutritional quality of feed. In: Maryland Nutrition Conference Proceedings, College Park, MD, p. 73.

3. https://www.dsm.com/markets/anh/en_US/Compendium/vitamin_basics/vitamin_stability.html. Accessed on December 1, 2017.

4. Improve Vitamin A Retention Within a Vitamin Mineral Premix, BB-03-00318.



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