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# Effect of CaptiSURE™ on Vitamin Stability and Enzyme Activity

## Reducing Risk While Maintaining Nutrient Function

### Viral Pathogens are a Risk

Certain viruses, including some emerging animal diseases, have been shown to remain viable in some common feed ingredients after experimental contamination and simulated transboundary shipping conditions.[1,2,3] Recent research from Kansas State University has further explored the transmission of African Swine Fever virus (ASFv) through feed and water – demonstrating that both are plausible infection vehicles, with risk positively correlating to the number of animal exposures (i.e. the more often an animal comes into contact with contaminated feed or water, the more likely they are to become infected).[4] The nature of feed manufacturing has evolved from locally-sourced to globally-sourced feed ingredients; this means that some ingredients may originate from regions where disease outbreaks are active. With an increasing awareness of emerging animal diseases and their ability to cross national boundaries, there is a greater need for vigilance and improving methods of mitigating risk in the global economy.

### Feed Biosecurity and the Use of Mitigants

So, what specific steps can be taken to mitigate risk? Of course, responsible sourcing is critical – feed and feed ingredients should be sourced from growers, manufacturers and suppliers that have proven, demonstrable quality and safety standards. Although some advocate that holding times can be effective, there is variability – and therefore, inherent risk – associated with this practice. Proposed holding times range from 45 days to nearly 300 days, depending on the ingredients in question, temperature, storage conditions and more.[5] For many manufacturers and producers, these extended holding times simply may not be entirely feasible.

Some chemical mitigants have shown the ability to inactivate viruses. Formaldehyde and medium chain fatty acids (MCFA) have been two chemicals of great interest in recent years. Recent research led by Dr. Scott Dee and Pipestone Applied Research has also shown the ability of a MCFA product to prevent the transmission of Porcine Epidemic Diarrhea virus (PEDv), Porcine Reproductive and Respiratory Syndrome Virus (PRRSV), and Senecavirus A (SVA) when included in feed.[6] This research employed a novel challenge method on a large scale to achieve the most realistic outcomes yet.

### Stability of Vitamins[7]

With many producers evaluating the risk of internationally-sourced ingredients, chemical mitigants are being turned to. If a decision is made to use a mitigant with nutritionally important ingredients, such as vitamins, it is of upmost importance to assure that they will not have a negative effect on the stability of the ingredient and, therefore, a detrimental effect on animal performance. With this purpose in mind, DSM and Kemin partnered to investigate the impact of CaptiSURE™ application on high-quality vitamin and vitamin/trace mineral (VTM) premixes.

CaptiSURE is a new product used as an energy source in livestock and poultry diets – it contains palm kernel oil and is comprised of a blend of medium chain fatty acids. In this study, a 4 pound/ton swine VTM or vitamin premix, which contained a source of phytase (Ronozyme HiPhos GT, DSM), was treated with 2% CaptiSURE (treatment) or 2% mineral oil (control) and stored for up to 70 days under two storage conditions: ambient winter temperatures and high humidity (Nov-Jan in Des Moines, IA) or controlled conditions with high temperature and low humidity (≥ 85°F and ≤ 40% RH).

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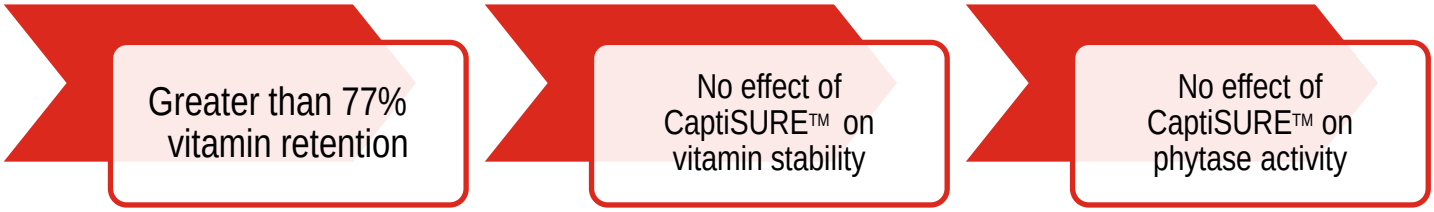
After 70 days, all vitamins were retained at greater than 77% of their initial levels – additionally, there were no differences between the control-treated (mineral oil) and CaptiSURE-treated premixes. The use of CaptiSURE under two storage conditions did not have an impact on the stability of vitamins and enzyme used in this study. These results are positive and impactful – building on existing research and confirming that treatment with a mitigant may be a viable option for producers aiming to reduce risk and to improve the safety of their feed ingredients, and their animals.

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