

An evaluation of a liquid antimicrobial (Sal CURB®) for reducing the risk of viral proxies for foreign animal diseases in contaminated feed

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Porcine epidemic diarrhea virus (PEDV) is a trans-boundary pathogen confirmed to be spread through contaminated feed. Recent research has also provided *in vivo* data supporting the ability of a liquid antimicrobial product (SalCURB®, Kemin Industries, Des Moines, IA, USA) to reduce this risk. Other risks to the US swine industry include foot-and-mouth disease virus (FMDV) and classical swine fever virus (CSFV); however, the effect of SalCURB® on these agents is unknown. To gain an estimate of its effect, viral proxies for FMDV and CSFV were selected according to morphological similarities (classification, size, shape, structure, etc). Specifically, as a proxy for FMDV and CSFV, cultures of encephalomyocarditis virus (EMCV) and bovine viral diarrhea virus (BVDV), respectively, were established under laboratory conditions. An *in vitro* model was developed to test the ability of SalCURB® to reduce viral load and virus viability in contaminated feed. SalCURB®-treated feed (10 replicates: 15g feed + 0.05mL SalCURB®) was spiked with 2 mL of a stock isolate of EMCV (5 logs/mL) and BVDV (4 logs/mL) per 15 g of feed. The titrated level of SalCURB® was based on label claim of 6.5 lbs product/ton of feed. Positive controls (10 replicates, feed/virus/no SalCURB®) and negative controls (feed/saline placebo) were included in the design. Over a 10 day sampling period (day 0, 2, 4, 8 and 10), feed samples were collected and tested by PCR and VI. Results indicated that significant reductions ($p < 0.0001$) were observed in EMCV and BVDV quantities in treated feed versus positive control feed. In addition, virus isolation indicated recovery of infectious EMCV and BVDV in non-treated feed at 10 and 4 days respectively; however, viable virus of either variant was not detected at 2 days post-inoculation in treated feed. These data indicate that the treatment of feed with Sal CURB® negatively influenced the survival of viral proxies for foreign animal diseases in feed. While further studies are required, involving the actual viral pathogens, these data suggest that the liquid antimicrobial SalCURB® may be an important component of a feed biosecurity program.