Sal CURB®

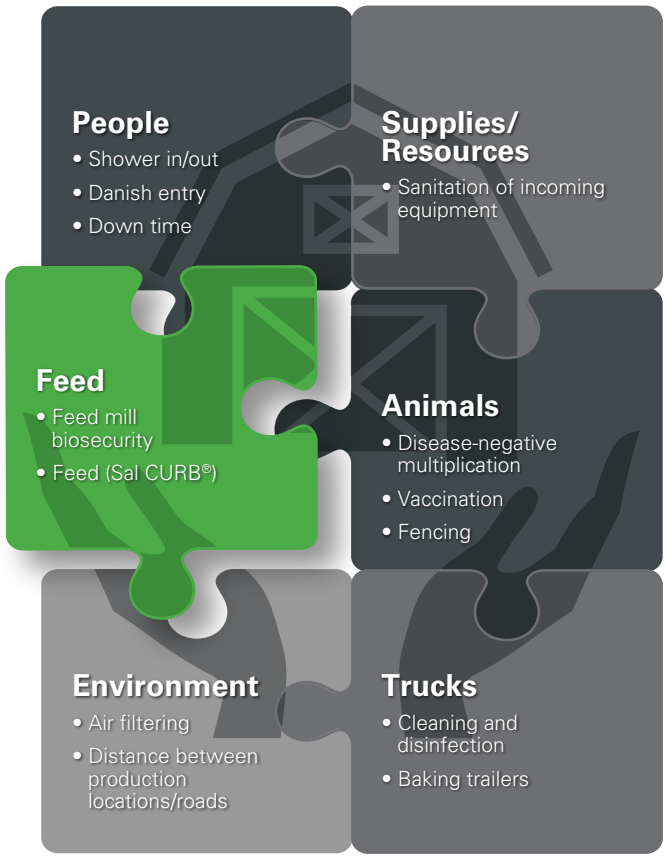
SAFETY / EFFICACY / ACCURACY

HOW SECURE IS YOUR FEED?

When properly executed, on-farm biosecurity programs minimize the risk of animals being exposed to pathogens that may be detrimental to health and performance – and ultimately, profitability. Many operations implement shower in/shower out, truck cleaning and disinfection and vaccination protocols. However, how many are addressing feed? Feed is a proven transmission route for disease. If pathogens enter the feed supply chain, chances of infection are high, as animals are exposed to feed multiple times each day.

The first reports of pathogen transmission via feed date back to the early 1960s. Since then, research has demonstrated that many pathogens remain stable and infective in feed ingredients for long periods of time. Thus, feed is a critical component of a comprehensive biosecurity program.

Key biosecurity components



Cases of disease transmission through feed

Salmonella transmission through feed

1960's
Health officials concerned about transmission of *Salmonella* through feed.[1]

1991-2010
Studies confirmed the risk of feed transmission of *Salmonella* and potential risks to food safety.[2,3]

PEDV transmission through feed

2013
PEDV outbreak in the U.S. led to the loss of over 8 million pigs in the first year.

2014-2015
Case study found feed correlated to PEDV outbreak.[4,5,6]

Critical viruses/FADs remain infective in feed

2018
ASFV outbreak led to the loss of about 40% of the Chinese swine population within the first year.

2018
ASFV, SVA, PRRSV and other viruses showed survival in feed and feed ingredients under transpacific shipment.[7]

2020
Critical viruses are amongst the hardiest – ASFV, SVA (surrogate for FMDV), PRV, PSV (surrogate for SVDV), and PEDV.[8]

KEMIN®

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Feed biosecurity with Sal CURB®

Sal CURB® liquid antimicrobial is a blend of aqueous formaldehyde 37% solution. Sal CURB maintains the Salmonella-negative status of complete feeds and feed ingredients for up to 21 days.

Beyond Sal CURB's application for Salmonella, Kemin has worked closely with multiple third-party research institutions to investigate efficacy against many viruses within feed.

Extensive research timeline of Kemin pathogen control solutions

2000-2014

Salmonella
10+ studies documenting the efficacy of **Sal CURB** against *Salmonella*.[9]

2014

PEDv
No PEDv infection was observed in pigs fed **Sal CURB**-treated diets.[10]

2014

FMD/CSFv
Study with surrogates for FMDv and CSFv detected no virus in **Sal CURB** treated feed.[11]

2015

FMD/CSFV
18 different feed ingredient samples treated with **Sal CURB** remained PEDv-negative.[12]

2015

PEDv
Transmission of PEDv was prevented with **Sal CURB** treatment.[13]

2016

PEDv
In a transoceanic shipping model, feed ingredients treated with **Sal CURB** remained PEDv-negative.[14]

2017

PEDv/SVA/PRRSv
No evidence of PEDv, SVA or PRRSv infection was observed in piglets fed **Sal CURB** treated diets.[15]

2020

ASFv
Sal CURB effectively controlled ASFv in feed. Kemin acquires related U.S. patent application.[16]

2022

FMD
Transmission of FMD through feed was prevented with **Sal CURB** treatment.[17]

Sometimes overlooked, feed biosecurity is rapidly becoming a top priority in comprehensive biosecurity programs. In this era of global production and trade, disease risk has also become global. Proper biosecurity has never been more essential and must encompass all inputs coming onto a farm – including feed. Sal CURB is the most tested, trusted and cost-effective feed biosecurity solution on the market today and should be considered as a part of your comprehensive biosecurity program.

References:

[1] Williams, 1981. Salmonellas in poultry feeds - a worldwide review. World's Poultry Science Journal, 37(1), 6-25.

[2] Jones et al., 1991. A survey of Salmonella contamination in modern broiler production. Journal of Food Protection, 54(7), 502-507.

[3] Molla et al., 2010. Salmonella enterica in commercial swine feed and subsequent isolation of phenotypically and genotypically related strains from fecal samples. Appl. Environ. Microbiol., 76(21), 7188-7193.

[4] Dee et al., 2014. An evaluation of contaminated complete feed as a vehicle for porcine epidemic diarrhea virus infection of naive pigs following consumption via natural feeding behavior: proof of concept. BMC Veterinary Research, 10(1), 176.

[5] Pasick et al., 2014. Investigation into the role of potentially contaminated feed as a source of the first-detected outbreaks of porcine epidemic diarrhea in Canada. Transboundary and Emerging Diseases, 61(5), 397-410.

[6] Bowman et al., 2015. Investigating the introduction of porcine epidemic diarrhea virus into an Ohio swine operation. BMC Veterinary Research, 11(1), 38.

[7] Dee et al., 2018. Survival of viral pathogens in animal feed ingredients under transboundary shipping models. PLoS One, 13(3).

[8] Stoian et al., 2020. Stability of classical swine fever virus and pseudorabies virus in animal feed ingredients exposed to transpacific shipping conditions. Transboundary and Emerging Diseases.

[9] Sal CURB® Liquid Antimicrobial: Internal Research Summary, TL-14-00042.

[10] Dee, S., C. Neill, T. Clement, J. Christopher-Hennings and E. Nelson. (2014, Sept.). An evaluation of a liquid antimicrobial (Sal CURB®) for reducing the risk of porcine epidemic diarrhea virus infection of naïve pigs during consumption of contaminated feed. BMC Veterinary Research. 10(1):220.

[11] Dee, S., T. Clement, A. Singrey, J. Christopher-Hennings, E. Nelson. (2014, Dec.). An evaluation of a liquid antimicrobial (Sal CURB®) for reducing the risk of viral proxies for foreign animal diseases in contaminated feed (symposium paper). North American PRRS Symposium, Chicago, Illinois. 118.

[12] Dee, S., et al. (2015, July). An evaluation of porcine epidemic diarrhea virus survival in individual feed ingredients in the presence or absence of a liquid antimicrobial. Porcine Health Management. 1(1):9.

[13] Effect of Sal CURB® on PEDv transmission via contaminated feed. 2015. TD-16-00196.

[14] Dee, S., et al. (2016, March). Modeling the transboundary risk of feed ingredients contaminated with porcine epidemic diarrhea virus. BMC Veterinary Research. 12(1):51.

[15] Dee, S. and P. Webb. (2019). Foreign Animal Disease (FAD) Preparedness & Mitigation Efforts Update. Minnesota Pork Congress. Minneapolis, Minnesota.

[16] Mitigating the risk of African swine fever virus in feed with anti-viral chemical additives. Transboundary and Emerging Diseases. Online ahead of print. doi.org/10.1111/tbed.13699

[17] Stenfeldt, C., Bertram, M.R., Meek, H.C., Hartwig, E.J., Smoliga, G.R., Niederwerder, M.C., Diel, D.G., Dee, S.A. and Arzt, J., 2022. The risk and mitigation of foot-and-mouth disease virus infection of pigs through consumption of contaminated feed. Transboundary and Emerging Diseases.

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