ETEC CHALLENGED PIGS FED DiETS WITH SPRAY DRIED PLASMA HAVE BETTER GROWTH AND SURVIVAL

The recent re-emergence of ETEC related disease has primarily been associated with F18 and K88 *Escherichia coli* strains with reports of up to 20-30% nursery pig mortality in severe cases. Traditional health management protocols appear to be less effective, and this may be related to recent reports that current strains of ETEC have developed more resistance to medications approved for use in swine. Nutritional strategies to reduce the severity of ETEC disease include use of diets with highly digestible ingredients, like spray dried plasma (SDP), milk proteins, soy isolate protein, and fibrous ingredients like rolled oats. Two recent studies [1,2] confirm that spray dried plasma in feed can improve survival and growth of pigs under ETEC F18 or K88 challenge.

In study 1, pigs were fed diets with either 4.12% soy protein isolate (SPI) or 5% UV treated porcine spray dried plasma (SDPP-UV) for 21 days postweaning. At d 7, all pigs were challenged with F18 ETEC. Survival (Figure 1) was improved 63% (P = 0.0885) for pigs fed diets with SDPP-UV (54.3%) versus SPI (33.3%) and surviving pigs fed SDPP-UV were about 1.5 kg heavier than surviving pigs fed SPI at d 21 (Figure 2). In Figure 3 the fecal shedding quantified score for F18 ETEC was reduced (P < 0.05) for pigs fed SDPP-UV (2.314) versus SPI (3.172) on day 2 post-challenge.
In study 2, weaned pigs were fed 4 different nursery feed programs containing 0, 3, 6 or 9% bovine SDP from 21 to 35 d of age respectively, followed by phase 2 diets containing 0, 1.5, 3 or 4.5% SDP from 36 to 49 d of age and then all pigs were fed a common diet without SDP from 50 to 59 d of age. All pigs were inoculated with K88 ETEC on d 21, 23 and 25 of age. Pigs started on 6 and 9% SDP had lower counts of ETEC in feces (Figure 4) and had > 3 kg higher average body weight at 59 d of age compared to 0 or 3% SDP (Figure 5). Providing 6 or 9% SDP in feed helped pigs transition through a K88 challenge during the first week after weaning and achieve an average BW that was greater than 25 kg at 59 days of age.

In both studies pigs fed diets with SDP were more resilient to ETEC challenge and ETEC fecal excretion was reduced suggesting that dietary SDP helps pigs transition through a ETEC challenge more rapidly with less detrimental effects on survival and growth.

Figure 4. Fecal ETEC Quantification from Pigs Fed Varying Levels of Plasma in Feed
Fecal samples collected day 28 of age, 72 h post inoculation with K88
Pigs fed increasing levels of plasma had reduced fecal ETEC

Figure 5. Plasma Feed Program Improves Growth of Pigs Challenged with ETEC K88
Phase 1: 21-35; 2: 36-49; 3: 50-59 Days of Age; K88 Challenge D 0, 2 & 4 Post-Weaning
Pigs started on diets with 6 or 9% SDP exceeded 25 kg BW by 59 day of age, despite K88 challenge during first week after weaning

1Campbell et al., 2022; Allen D. Leman Swine Conference, St. Paul, MN.