



SPRAY DRIED PLASMA MITIGATES THE NEGATIVE EFFECTS OF MYCOTOXINS IN PIG DIETS

Mycotoxins are naturally occurring metabolites produced by fungi commonly found in cereal grains used for animal feed that are toxic and can cause significant economic loss for livestock producers. Mycotoxins such as aflatoxins (AF), fumonisins (FUM), and deoxynivalenol (DON) reduce weight gain, impair the immune system response, and cause injury to the gastro-intestinal, pulmonary, hepatic and cardiovascular systems of pigs.

Spray dried plasma (SDP) supplemented in feed improves post-weaning feed intake, growth, feed efficiency and survival of pigs and has functional components that efficiently modulate the immune system response to help animals thrive during periods of stress. Several studies report that dietary SDP mitigates the negative effects of various mycotoxins in feed for pigs by improving the efficiency of the immune system response and by reducing mycotoxin-induced oxidative damage resulting in improved body weight gain and reduced post-weaning diarrhea.

EFFECT OF SDP ON GROWTH OF PIGS FED DIETS WITH MYCOTOXINS

Figure 1 shows the average daily gain (ADG, g/d) of weaned pigs fed starter diets without DON (Control), with 3.9 ppm deoxynivalenol (DON), DON + 0.2% Clay binder, DON + 8% SDP, or DON + 8% SDP + 0.2% Clay binder for 20 days post-weaning [1]. Pigs fed diets with SDP + DON grew as well as pigs that were not fed a diet with DON and significantly ($P < 0.05$) better than pigs fed a diet with DON or DON + Clay binder.

Figure 2 shows ADG of pigs fed either 0 or 6% SDP in phase 1 diets free of mycotoxins fed for d 0-12 postweaning, followed by phase 2 diets fed d 12-33 that contained either 0 or 230 ppb aflatoxins + 9 ppm fumonisins [2]. Feeding of 6% SDP in the phase 1 diet increased ADG by 42%. Feeding of mycotoxins in phase 2 diets reduced cumulative ADG by 16% over the 33-day feeding period if pigs were not fed SDP in the phase 1 diet. Cumulative ADG of pigs previously fed SDP in the phase 1 diet was not significantly reduced overall when fed mycotoxins during phase 2. Getting pigs off to a great start with 6% SDP in phase 1 diets prepares them to be more resilient to mycotoxins in phase 2 diets.

Figure 1. ADG of Pigs fed Diets with DON, SDP or Clay Binder

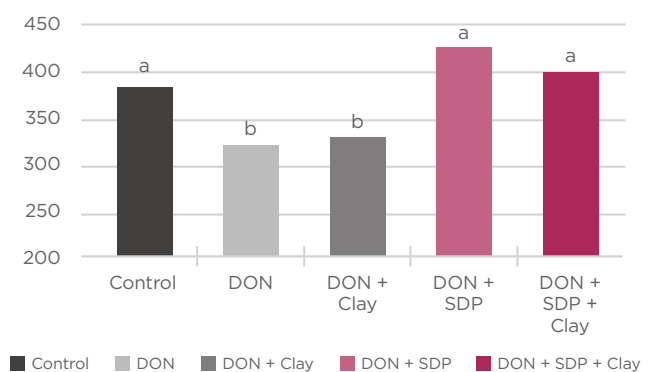
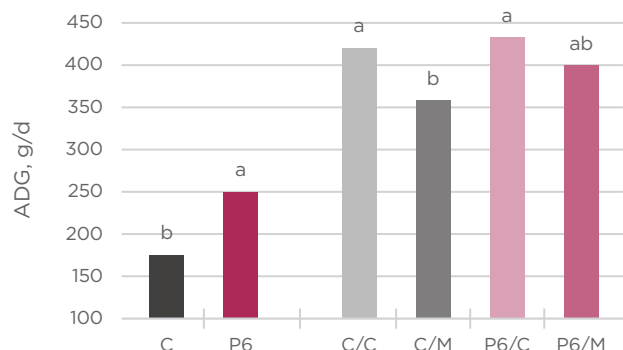


Figure 2. ADG of pigs fed SDP in phase 1 diet without mycotoxins and cumulative ADG of pigs fed phase 2 diets with or without mycotoxins



Phase 1 diets: C = control; P6 = 6% SDP; Phase 2 diets C = control; M = mycotoxins; C/C = control fed phase 1 and 2; C/M = control phase 1/mycotoxins phase 2; P6/C = SDP phase 1/control phase 2; P6/M = SDP phase 1/mycotoxins phase 2

■ C ■ P6 ■ C/C ■ C/M ■ P6/C ■ P6/M

Figure 3 shows the body weight gain (kg) of weaned pigs fed diets with or without 6% SDP and with or without mycotoxins (300 ppb Aflatoxins and 8000 ppb Fumonisin) for 15 days [3]. Pigs fed 6% SDP were 2 kg heavier in just 15 days compared to pigs fed a control diet regardless of presence or absence of mycotoxins in the diet.

Figure 4 shows incidence of diarrhea was also significantly reduced for pigs fed 6% SDP compared to control pigs regardless of presence or absence of mycotoxins in the diet [3].

Figure 3. Body weight gain of weaned pigs fed diets with or without SDP or Mycotoxins

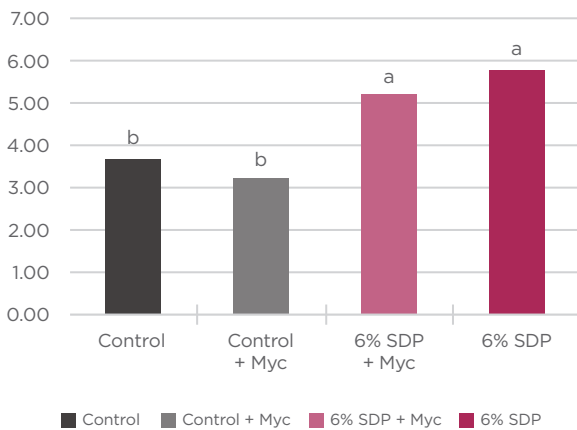
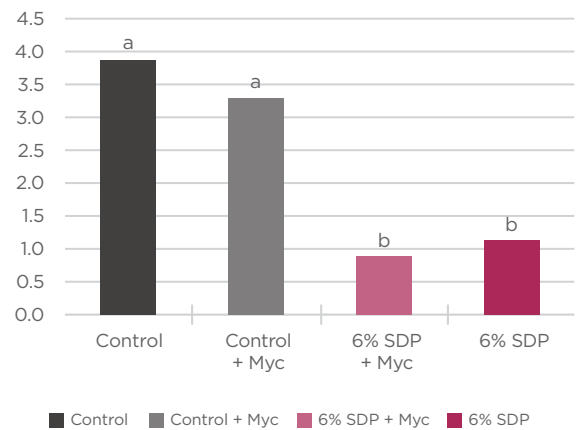
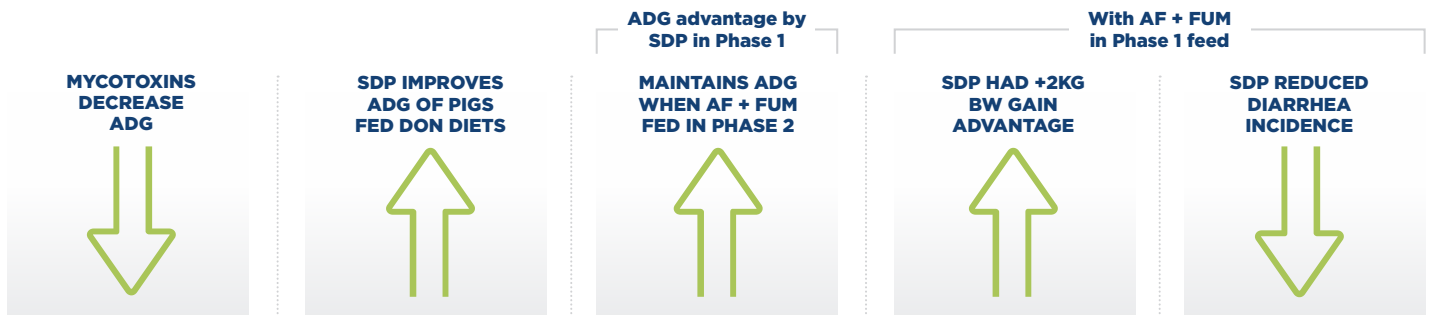


Figure 4. Incidence of diarrhea in weaned pigs fed diets with or without SDP or Mycotoxins



Collectively, results presented in Figures 1-4, demonstrate that 6-8% SDP in mycotoxin-contaminated starter feed for pigs overcomes the growth-depressing effects caused by DON, AF or FUM. Also, prior feeding of 6% SDP in a phase 1 diet prepared pigs to be more resilient to mycotoxin-induced growth depression when fed in phase 2. In situations where use of mycotoxin-contaminated cereal grains cannot be avoided, SDP should be considered an essential ingredient to help pigs thrive and perform well.

BOTTOM LINE



1. Eastwood et al., 2012. Spray-dried animal plasma mitigates the negative impact of Deoxynivalenol (DON) in nursery pigs. Prairie Swine Centre Annual Report 2012-2013, p 38-40.
2. Weaver et al., 2014. Efficacy of dietary spray-dried plasma protein to mitigate the negative effects on performance of pigs fed diets with corn naturally contaminated with multiple mycotoxins. J. Anim. Sci. 92:3878-3886.
3. Müller et al., 2018. Post-weaning piglets fed with different levels of fungal mycotoxins and spray-dried porcine plasma have improved weight gain, feed intake and reduced diarrhea incidence. Micro. Path. 117:259-264.