



## FEEDING SPRAY DRIED PLASMA (SDP) IMPROVED THE EFFICACY OF A CANDIDATE AFRICAN SWINE FEVER VIRUS (ASFV) VACCINE

Spray dried plasma (SDP) is a highly digestible, high-protein ingredient widely used in feed for weaned pigs. The benefits of SDP on growth performance, gut function, and immunity are well known. Previous studies demonstrated that feeding SDP improved mucosa integrity and cell mediated immunity, two important aspects that may help to improve the efficacy of a ASFV vaccine.

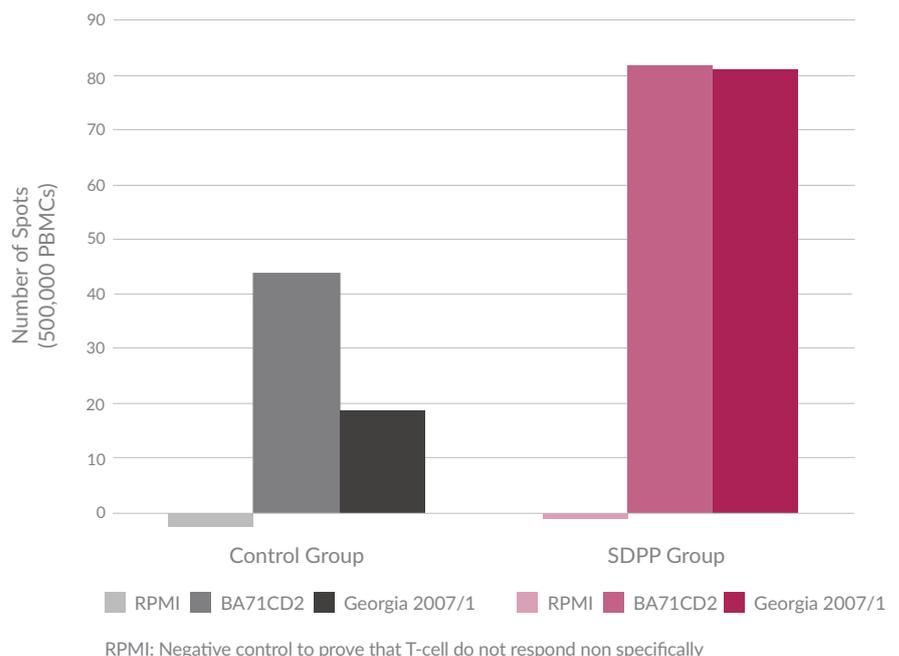
## REDUCE EXCRETION OF ASFV WILD TYPE DURING EXPOSURE PERIOD AND IMPROVE SPECIFIC T-CELLS RESPONSE TO ASFV

Twenty weaned pigs were randomly assigned to either a control (n=14) or porcine SDP (n=6) feed treatment group. Eight pigs fed the control diet were selected to serve as directly inoculated animals (trojans). At housing, test pigs were divided into two groups of 6 pigs and continued to be fed their respective diets for the entire study. On d 24 of the study, all test pigs were intranasally vaccinated with 2 mL of  $10^5$  PFU of IRTA-CReSA ASFV vaccine (BA71 $\Delta$ CD2). At d 19 post vaccination, the 8 non-vaccinated trojan pigs were inoculated by intramuscular injection with 1 mL of  $10^3$  GEC of ASFV strain Georgia 2007/01. Four trojans were introduced per treatment group 2 d post inoculation to expose the vaccinated test pigs to ASFV by direct contact. Trojan pigs were euthanized when they showed clinical symptoms of the disease.

During the exposure period 4/6 control group pigs did not show fever and the other two showed a peak rectal temperature  $> 40.5^\circ\text{C}$  before the end of the study at day 20 post-exposure. The pigs receiving the SDP diet did not show fever and were not PCR+ in blood or rectal swabs. The number of pigs with at least one day with PCR+ in blood, nasal or rectal swabs was higher for the control diet group during the exposure period (Figure 1).

At day 9 post-exposure, the specific T-cell response was analyzed against the vaccine virus (BA71 $\Delta$ CD2) and the wild strain (Georgia 2007/01). It was found that pigs in the SDP diet had higher specific T-cells responses for both ASFV strains compared with the pigs fed the control diet (Figure 1) indicating a higher immune priming.

Figure 1. Average IFN- $\gamma$  spots in T-cells response when challenged to ASFV vaccine (BA71 $\Delta$ CD2) or wild (Georgia 2007/01) strain on day 9 post-exposure





## REDUCE ASFV TISSUE INFECTIVITY OF ASFV WILD TYPE DURING EXPOSURE PERIOD

Tissue samples at 20 days post-exposure from 5/6 pigs fed the control diet was PCR+ for ASFV. None of the tissue samples from pigs fed SDP were PCR+ for ASFV at any given time after challenge (Table 1).

Table 1. Percentage of vaccinated contact pigs with ASFV PCR+ tissue samples at the end of the study (d 41)

ASFV PCR + Tissue	Treatment Groups	
	Vaccinated + Control	Vaccinated + SDP
Submaxillary Lymph Node (LN), %	67 <sup>b</sup>	0 <sup>a</sup>
Retropharyngeal LN, %	50 <sup>b</sup>	0 <sup>a</sup>
Gastro-hepatic LN, %	50 <sup>b</sup>	0 <sup>a</sup>
Spleen, %	67 <sup>b</sup>	0 <sup>a</sup>
Tonsil, %	83 <sup>b</sup>	0 <sup>a</sup>

Row with uncommon superscripts differ; <sup>a,b</sup> (P < 0.05).

### BOTTOM LINE

The research is clear: The vaccine candidate BA71ΔCD2 protected pigs against the ASFV wild strain because none of the contact pigs died due to ASFV. However, the nutrition provided by the inclusion of SDP in the diet improved the efficacy of the candidate ASFV vaccine likely by improving mucosa integrity and cell mediated immunity. Thus, vaccinated pigs fed a diet with SDP showed absence of ASFV in blood, fecal swabs, and tissues after challenge with the ASFV Georgia 2007/01 strain. These results offer a novel nutritional strategy using SDP to enhance the efficacy of a candidate ASFV vaccine and improve health status of pigs under ASFV conditions.