ASF EXPERT SERIES:
HOW TO COMBAT THIS LONG BATTLE AND SUCCEED

SWINE

UPDATE ON THE CURRENT ASF SITUATION AND TRANSMISSION PATHWAYS THROUGH DIFFERENT MATRICES (PART 2/2)

Dr. Sandra Blome
Head, German National Reference Laboratories For African and Classical Swine Fever

APC hosted a webinar series of "ASF Expert Series: How to combat this long battle and succeed." which presented a different perspective from global swine experts on the status of ASF virus and some of the strategies that are working in other regions. In the second series, APC invited Dr. Sandra Blome, Head of German National Reference Laboratories for African and Classical swine fever, to share her experience.

Status of ASF in Europe & worldwide

Dr. Blome reminded us that the African Swine Fever pandemic has already spread throughout Asia, parts of Europe, Africa, and recently in the Americas. In addition to wild boars as a natural reservoir of the disease, Illegal vaccines have been implicated in disease courses that resemble PRRS and make clinical diagnosis much more challenging. Strong candidates of the ASF vaccine are being studied for genetic stability and safety, especially in field conditions.

Potential ASFV transmission risks associated with feed matrices have been assessed for animal by-products, feed materials, compound feed, and bedding materials.

- Animal by-products produced in the EU are controlled by a standard processing method for Category 3 Animal By-Products (hydrolyzed proteins, pig blood products, spray-dried porcine plasma, rendered fat, gelatin, calcium phosphate, and collagen). Studies showed a proper treatment of heating, drying, and changes in pH inactivated ASFV. Blazquez et al (2018) reported a reduction of 4 log10 virus (>99.99%) during the spray-drying process of porcine plasma product. Storage condition at room temperature for 2 weeks also inactivates ASFV, if any were to recontaminate the spray-dried porcine plasma product (Fischer et al., 2021).

- For feed materials (cereal grains, oilseed/fruits, legume, tubers, roots, and forage/roughage), studies showed a proper drying and storage condition (2 hours drying at room temperature in most cases) also inactivated ASFV. More focus should be placed on those materials used in a larger quantity and are often mixed from various origins.

- For compound feed and additives, standard manufacturing processes and proper storage conditions mitigate most transmission risks.

- There is no data in the literature on bedding materials, but turf and peat are generally relatively safe due to their low pH.

EFSA scientific opinion (EFSA 2021) on the ability of different matrices to transmit ASFV suggested that the risks are present but at a low level. Relatively, hydrolyzed protein, blood products, and spray dried plasma protein (SDPP) have lower risks as compared to cereal grains, legumes, and oilseeds, mainly due to the well-controlled manufacturing process and quality control (no blood is collected from sick animals). The risk of ASFV transmission by contaminated SDPP is eliminated if stored at room temperature for at least two weeks. Overall, ASFV transmission risk ranking depends on the number of consignments, quantity, and mixture from various origins. Proper processing and duration of storage conditions are keys to decreasing the transmission risk of ASFV.

DIETARY STRATEGIES TO MAXIMIZE PIG PRODUCTION EFFICACY

Dr. Javier Polo, Senior Vice-President Global R&D from APC, talked about how spray-dried plasma (SDP) was used as a dietary strategy to maximize pig production efficacy. Beyond its nutritional value, SDP contains a diverse mixture of functional bioactive proteins, including albumin, immunoglobulins, transferrin, peptides, growth factors, cytokines, enzymes, and other components. When animals are challenged or stressed, nutrients are used to support the immune system response instead of for growth. When SDP is fed, functional plasma proteins improve the efficiency of the immune response, thereby improving the growth efficiency and survival of the animals.

Numerous studies from 35+ years demonstrated that SDP used in creep and starter feed for at least two weeks post-weaning improved ADG by 31%, ADFI by 25%, and FCR by 4%. A study done in Thailand showed 4% and 6% SDP fed in creep feed for 14 days significantly improved body weight more than 600 grams at 31 days of age, compared to 0% and 2% SDP. In a 2011 study, significant improvement in diarrhea score, reduced pro-inflammatory cytokines, and restored barrier function was achieved when a minimum of 5% SDP in feed was provided for 14 days post-weaning. Weaned pigs provided 6% SDP only in the starter feed for the initial two weeks after weaning had 50% lower wean-to-market mortality rate and 2.5 kg heavier carcass weight at slaughter, which resulted in an additional $13 margin per pig.

A meta-analysis done in 2011 suggested that regardless of weaning age (ranging from 10 to 32 days), ADFI and ADG responded positively to SDP supplementation. In challenging conditions across multiple species with both enteric and respiratory disease, SDP helped to improve the fecal score, ADG, survival rate, and feed efficiency.

A recent PEDV challenge study in 2018 showed that weaned pigs fed a diet with bovine plasma induced an earlier antibody response with more rapid clearance of the PEDV virus found in feces.

In a commercial farm, 960 piglets from PRRSV positive sows were fed diets with SDP for 21 days after weaning. At 48 days of the study or 69 days of age, pigs provided SDP in the feed were 0.8 kg BW heavier. The mortality rate was 40% lower than the control group. Another study showed that pigs fed 6% SDP with or without aflatoxin and fumonisin contamination had higher ADG than the control group.

An internal study confirmed that the efficacy was found to be equal between bovine and porcine plasma in starter diets for weaned pigs.

SDP is an ideal replacement for antibiotic growth promoters (AGP). *In enterotoxigenic (ETEC) E. coli challenged pigs, SDP and ZnO equally improved fecal consistency and reduced mortality and excretion of ETEC.* ZnO's pharmaceutical levels will soon be banned in the EU and Canada due to its tendency to increase bacteria resistance. Therefore, SDP can be an excellent alternative to replace the use of ZnO and AGP. A study in weaned piglets showed 5% SDP can replace 2,500 ppm ZnO. A meta-analysis review of the literature confirmed that growth efficiency (ADG, ADFI, FG) was maintained when SDP was used with or without in-feed antibiotics. In contrast, data from 24 nursery trials conducted in the US showed that when SDP was removed from pig starter diets, there was an average reduction of ADG (21%), ADFI (14%), and G:F (8.8%) observed.

In conclusion, SDP is an efficacious alternative to AGP in pig feed.

Dr. Javier Polo
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PRRSV: *Porcine Reproductive and Respiratory Syndrome Virus*
PEDV: *Porcine Epidemic Diarrhea Virus*
ASFV: *African Swine Fever Virus*
PPV: *Porcine Parvovirus*

References upon request.

SDP RECOMMENDED DOSAGE

PHASE	DAYS	SDP RECOMMENDED DOSAGE
PHASE 1 General Feeding Program	14	5%
PHASE 2 High Stress, Pathogen Challenged Conditions	15 - 21	2.5%
PHASE 3 High Stress, Pathogen Challenged Conditions	22 - 48	1.25%

For more information, contact the APC Technical Service team or visit our website

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