

## VARIOUS APPLICATIONS OF SPRAY DRIED PLASMA (SDP) IN SOW FEED BENEFITS SOW AND LITTER PERFORMANCE

SWINE



Spray dried plasma (SDP) in creep and starter feed is well-known to increase feed intake and growth of pigs through the stressful weaning transition period. The sow can also experience heat stress or disease stress like Porcine Reproductive and Respiratory Syndrome (PRRS) during gestation and lactation that can reduce sow and litter performance. Lactating sows nursing large-size litters need to consume high feed intake to maintain their body condition and support milk production for piglet growth and survival.

During summer months sows may not eat enough feed to support their body condition and produce enough milk for their pigs. Disease episodes like PRRS can disrupt sow reproduction and litter performance. Even under normal health and ambient environmental conditions, modern prolific sows delivering large-size litters go through a lot of physical stress that drains sow energy reserves, increases stillbirths, and slows recovery after farrowing which may affect subsequent sow reproductive performance.

Research shows that SDP in sow feed benefits both sow and litter performance and can have longer-term effects on subsequent sow reproductive performance.



### SDP IN LACTATION FEED DURING SUMMER MONTHS

During summer months it can be difficult to get lactating sows to eat enough feed and nutrients to support their own body needs and produce enough milk to support litter growth and survival.

Combined data from 5 experiments reported in 2 publications [1,2] and standardized to an 18-day lactation period show that including 5 kg/ton (0.5%) SDP in lactation feed during summer months increased feed intake of young sows having their first or second litter (parity 1 & 2 sows). Young sows having low feed intake can have a higher incidence of reproductive dysfunctions after weaning.

Young parity sows provided the lactation diet with SDP had a reduced wean-to-estrus interval and a higher percentage of sows having estrus between day 4 to 6 after weaning, which indicates a higher likelihood of longevity in the breeding herd.

For multiparous sows provided SDP in lactation feed, a higher percentage of sows successfully farrowed their next litter. Multiparous sows provided plasma in lactation feed also had increased litter weight and average pig weight at weaning with more pigs per litter at weaning. Most data reports that heavier pigs at weaning have increased growth and survival rate to market weight versus lower body weight pigs at weaning.

A low inclusion of SDP (5 kg/ton) in lactation feed can improve reproductive performance of sows and also increase average pig weight and number of pigs weaned per litter.

## SDP IN LACTATION FEED DURING SUMMER MONTHS

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VARIABLE	SOW PARITY	CONTROL DIET	PLASMA DIET (5 KG/TON)	PLASMA ADVANTAGE
Sow feed intake, kg/d [1]	1 & 2	4.76	5.18	0.42 kg/d
Wean-to-estrus interval, d [1]	1	9.18	7.95	-1.23 d
Sows in estrus day 4 to 6, % [1]	1	61.4	71.0	9.6 %
Farrow rate to next litter, % [2]	Multiparous	86.8	92.3	5.5 %
Litter weight at weaning, kg [1,2]	Multiparous	46.6	48.4	1.8 kg
Average pig weight at weaning, kg [1,2]	Multiparous	5.16	5.48	0.32 kg
Pigs weaned per litter, n [1]	Multiparous	8.94	9.32	0.38 pigs/litter

## SDP IN GESTATION AND LACTATION FEED FOR A SOW HERD WITH A CHRONIC PRRS STATUS

The viral disease “PRRS” is endemic in most swine producing countries and causes major economic loss due to higher mortality and morbidity and reduced growth and reproductive performance.

At a 5000-sow herd with chronic PRRS status, 5 kg of SDP per ton (0.5%) was added to both gestation and lactation feed for 1 year. Production records were evaluated by statistical process control techniques to detect significant changes in sow herd productivity before and after use of SDP in the sow feed. After use of SDP in the sow herd feed the realized farrowing rate was improved 5% (Figure A) and about 400 more pigs were weaned per 1000 sows serviced (Figure B), even though PRRS virus activity persisted throughout the year SDP was included in the sow herd feed.

These results indicate that adding 5 kg SDP per ton of sow herd feed can reduce some of the chronic effects of PRRS on sow reproduction.

Figure A: Farrowing rate % before or after adding plasma to sow

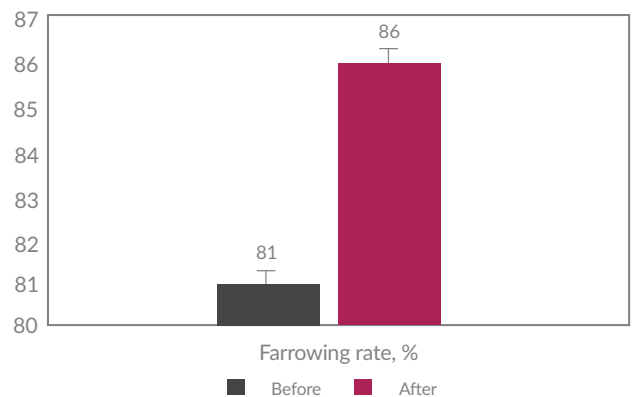
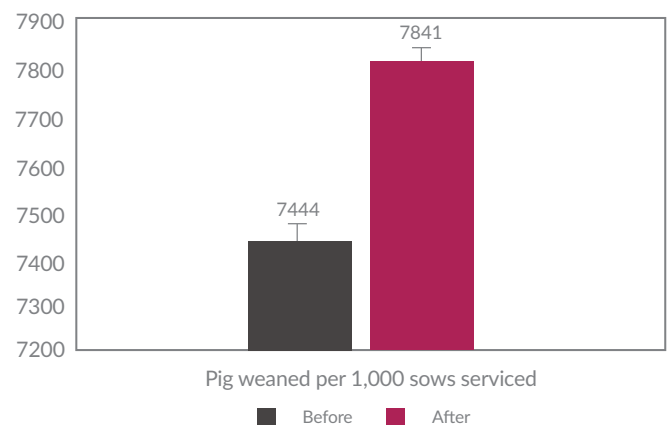


Figure B: Number of pigs weaned per 1,000 sows serviced





## SDP IN TRANSITION SOW FEED

Modern sows having large-size litters undergo a lot of stress, inflammation, and hormonal changes around the transition period from late pregnancy through early lactation. As litter size has increased, the number of stillborn pigs and pre-wean mortality has increased. There is growing interest in producing sow feed that can use specialty ingredients and nutrients that can reduce stress on sows as they transition through late pregnancy, farrowing and into lactation.

A study was designed to see if SDP in a transition sow feed could benefit sows during this stressful stage of production [4]. Sows were fed a transition diet containing either 0, 0.5% (5 kg/ton) or 2.5% (25 kg/ton) SDP from 6 days before farrowing through 5 days after farrowing.

Both levels of SDP in the transition feed significantly reduced the number of stillborn pigs per litter (Figure C). A longer-term benefit for providing plasma in transition sow feed for young sows (parity 1 & 2 sows) was a linear increase in number of live born pigs per litter the next time they farrowed (Figure D).

Based on the results of the previous transition sow feed study, a commercial sow farm used 5 kg SDP per ton (0.5%) in transition sow feed provided for 5 days before and 5 days after farrowing and showed a reduced number of stillborn pigs per litter and an increase in average birth weight of pigs (Figure E). The Control group represented individual sow data from 843 sows that were not provided a transition feed and the Plasma group represented data from 866 sows provided 0.5% SDP in transition sow feed [5].

Figure C: Number of stillborn pigs per litter

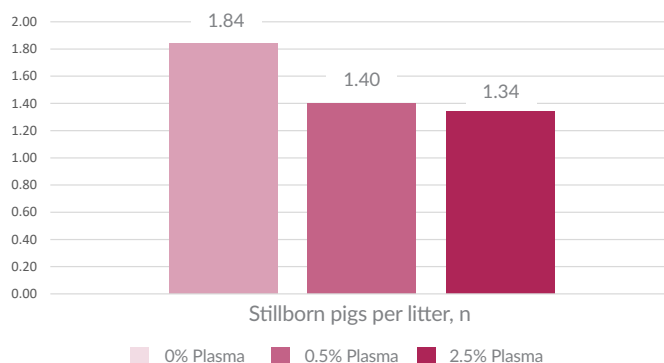


Figure D: Subsequent litter size of young sows fed plasma in transition feed during pervious cycle

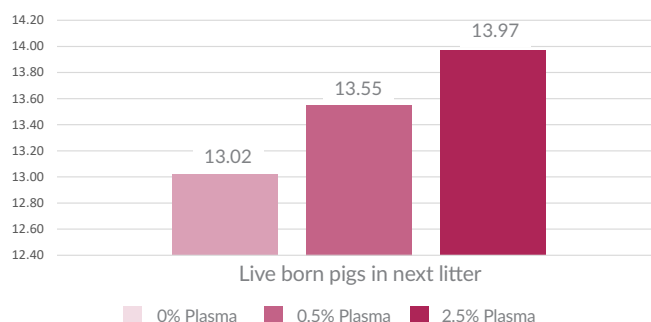
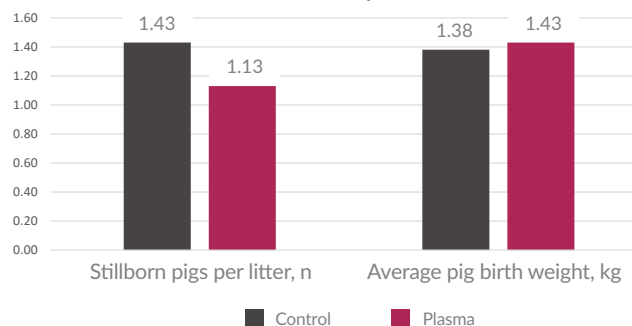


Figure E: Commercial farm study applying transition sow feed with plasma



## BOTTOM LINE

FARROWING RATE



REPEAT MATINGS



PIGS PER SOW MATED



## CONCLUSION

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SDP in sow feed has multiple applications and benefits for both the sow and litter:

- Lactating sows have higher feed intake, heavier litters and more quality pigs weaned and increased subsequent farrowing rate.
- Gestating and lactating sows under chronic PRRS status show higher farrowing rate with more pigs weaned per sow serviced.
- Plasma in sow transition feed reduced number of stillborn pigs, increased pig birth weight and increased live born pigs of young sows having their next litter.
- **Recommended to use 0.5% or 5 kg plasma per ton of sow feed.**

## REFERENCE

1. Crenshaw et al, 2007. *Lactation feed disappearance and wean to estrus interval for sows fed spray-dried plasma*. *J. Anim. Sci.* 85:3442-3453.
2. Crenshaw et al, 2008. *Effect of spray-dried plasma in diets fed to lactating sows on litter weight at weaning and subsequent farrowing rate*. *Proc. Allen D. Leman Swine Conf., Univ. MN, St. Paul, MN.* p. 47.
3. Campbell et al, 2006. *Use of statistical process control analysis to evaluate the effects of spray-dried plasma in gestation and lactation feed on sow productivity in a PRRS-unstable farm*. *Amer. Assoc. Swine Vet.* p 139-142.
4. Crenshaw et al, 2021. *Effect of spray-dried porcine plasma in peripartum sow feed on subsequent litter size*. *Porcine Health Management* 7:11 <https://doi.org/10.1186/s40813-020-00180-0>
5. Borges et al, 2023. *Transition sow feed supplemented with spray dried plasma reduced stillborn pigs per litter*. *Allen D. Leman Swine Conference Research Abstracts, September 16-19, 2023, St. Paul, MN, USA. Page 17, Poster 12.*