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PRODUCING HIGH QUALITY PIGLETS

1. Piglets are the future of the farm: it all starts with the sow

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In piglet production, genetic progress with highly prolific sows has led to a remarkable increase in litter size in the past few years. Such high litter sizes are a concern as they increase the risk for stillbirths and are associated with high piglet pre-weaning mortality.

So, there is a great potential to improve piglet survival with the sow having a major influence. Table 1 summarises the risk areas of large litters for both sows and piglets.

Improvement of piglet survival begins with the sow as there is a close link to farrowing. Farrowing is an important stress factor for sows and piglets, whereby a prolonged farrowing duration – especially with large litters – increases the number of stillborn piglets and reduces the vitality of the surviving piglets. Stillbirth rate in pigs varies between 5-10%, and up to 75% of the deaths appear during parturition caused by dystocia (weakness in labour) and intrauterine asphyxia (oxygen deficiency).

Stress at birth in context with a prolonged farrowing reduces colostrum and milk production in the first days after farrowing. This poses an additional risk to the piglets, especially as breeding for high litter yields have indirectly reduced the birth weight of the piglets and increased competition between littermates.

Besides the direct cost due to loss of stillborn piglets, the underlying causes may affect live-born pre-weaning mortality that can account for 10-20% of all live born piglets. A vital piglet quickly begins to suckle, which helps the newborns to maintain their body temperature and achieve a positive energy balance. Piglets with reduced vitality have often suffered oxygen deprivation at birth, which impairs their performance later in life.

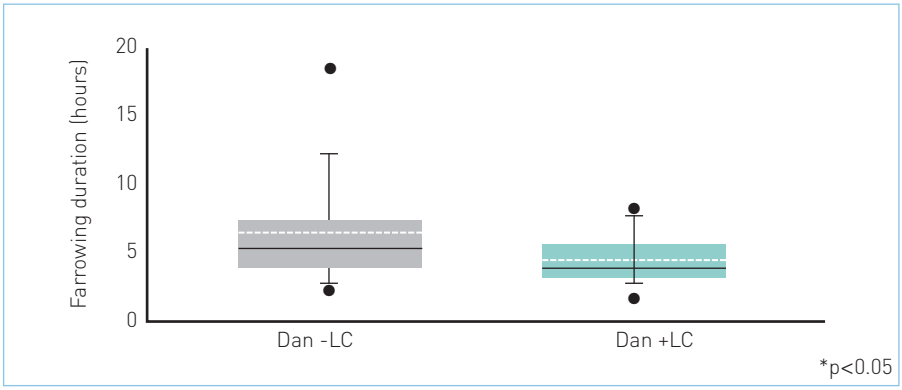

Fig. 1. Farrowing duration in highly prolific sows fed on a gestation diet with (Dan +LC) or without (Dan -LC) supplementation of eubiotic LC. Dotted line indicates mean value; black dots indicate minimum and maximum values (Hirtenlehner et al. 2021).

SAVING PIGLETS BY MANAGING THE SOW

So, the key to saving piglets that are at risk of death because of long farrowing lies in managing the sow before she gives birth. Causes of prolonged farrowing and increased stillbirth rate is maternal constipation as well as energy depletion during the energy demanding process of farrowing.

Supplementing the sow's diet with dietary fibre offers the opportunity to reduce the farrowing time and prevent constipation, whilst increasing colostrum intake and the performance of the piglets.

In general, fibre is considered in the context of avoiding constipation, but offers potential for an additional energy supply, provided that the fibre is fermentable. The sow can cover up to 25% of its maintenance energy requirement from the fermentation of dietary fibre in the colon.

The energy from the enzymatic digestion in the small intestine is available up to five hours after ingestion, while the fermentation products from the colon are provided over a period of 24 hours. For the sow this extra energy means the provision of energy for the birthing process.

CONVERTING STILLBORN TO LIVE-BORN PIGLETS

Research about the supplementation of eubiotic lignocellulose (LC) in gestation and lactation diets of sows showed positive effects on the farrowing duration as well as the piglet survival rate and the piglets' birth and weaning weights (Table 2).

Such an eubiotic LC (OptiCell, agromed Austria GmbH, Austria) is, compared with standard non-fermentable lignocellulose, partly fermentable, and may generate extra energy that can contribute to the sow's energy

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Table 1. Impact of large litter sizes on sows and piglets.

Piglets	Sow
Reduced birth weight	Prolonged farrowing
Reduced uniformity	Less colostrum
Increased stillbirths	Less milk/piglet
Increased pre-weaning mortalilty	Reduced fertility
Reduced post-weaning performance	Increased risk for postpartum dysgalactia syndrome (PDS)

Parameter	Control	Eubiotic LC
Farrowing duration (minutes)	220	180
Total piglets born	16.0	15.9
Share of piglets born alive (%)	90.2	93.2
Average piglet birth weight (kg)	1.13[a]	1.24[b]
Average weaning weight day 27 (kg)	7.20[a]	7.50[b]

[ab] significant different p<0.05

Table 2. Influence of LC on farrowing and litter performance (Baarslag et al. 2013).

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supply – reducing hunger stress in gestation as well as supporting the farrowing process. Recent results evaluated the impact of eubiotic lignocellulose supplementation on the farrowing process depending on the sows' breeding line. The research compared the supplementation of eubiotic LC to sows of standard (Large White x Landrace) or high prolific Danish genetic.

The results showed a more pronounced reduction of the farrowing duration in higher litter sizes and thus a stronger effect of LC supplementation in highly prolific sows compared to standard hybrids (Table 3). Supplementation of eubiotic LC significantly reduced farrowing duration in highly prolific sows (Danish genetic) and caused a 26% shortening of the farrowing duration (Fig. 1). The advances of breeding companies in the development of highly prolific sows allow litter sizes of more than 20 piglets and, thus, strongly supports farms to achieve the highest profitability. Nevertheless, high litter sizes have risks for sows and piglets, often correlated to a prolonged farrowing process. This in turn has negative consequences for both sow and piglet.

The supplementation of eubiotic lignocellulose effectively reduces farrowing duration with a more pronounced impact in highly prolific sows compared to sows of standard genetics. Conclusively, diets for highly prolific sows supplemented with premium quality lignocellulose, as used in this trial, are an efficient prerequisite to produce vital piglets as the basis for farm profitability. ■

References are available on request

Table 3. Impact of eubiotic lignocellulose supplementation for sows of different genetic breeding lines (mean values; Hirtenlehner et al. 2021).

	Control		Eubiotic LC	
	Standard genetic	Danish genetic	Standard genetic	Danish genetic
Piglets/litter	14.8	22.9	14.6	21.5
Birth interval (minutes/piglet)	16.7	17.1	15.4	12.7
Liveborn piglets/litter	13.6	18.4	13.4	19.4
Stillborn piglets/litter	1.2	4.5	1.2	2.1
Live-born piglets (%)	92.6	83.0	93.0	90.7