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PRODUCING HIGH QUALITY PIGLETS

3. Eubiotic lignocellulose and hyperprolific sows: a dream team

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Litter size is a crucial parameter for evaluating the profitability of swine farms. High-quality nutrition combined with improved reproductive management and enormous advances of genetic companies are the main drivers for the trend of a rapid rise in the number of piglets per sow per year.

With the commercialisation of those hyperprolific sows, on the one hand farms are able to increase their number of born piglets per sow per year, but on the other hand they are faced with some unfavourable side effects: large litters are closely related to a prolonged farrowing duration, which in turn is an enormous stress factor and the basis of several negative consequences for both sow and piglets.

MAJOR CHALLENGE TO MANAGEMENT

Farrowing duration and birth intervals are key factors for a successful farrowing influencing stillbirth rates, piglets' survival rate, and colostrum intake.

Thus, the recent genetic progress achieved in sows poses a major challenge to management.

	Control		Eubiotic LC	
	Austrian standard	Highly prolific	Austrian standard	Highly prolific
Number of litters	14	24	15	26
Farrowing length (min)	247	392	225	272
Piglets/litter	14.8	22.9	14.6	21.5
Birth interval (min/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
Liveborn piglets (%)	92.6	83.0	93.0	90.7

Table 1. Impact on eubiotic lignocellulose supplementation for sows of different genetic breeding lines (mean values).

On farms, increased litter size often results in low piglet birth weights and increased piglet mortality.

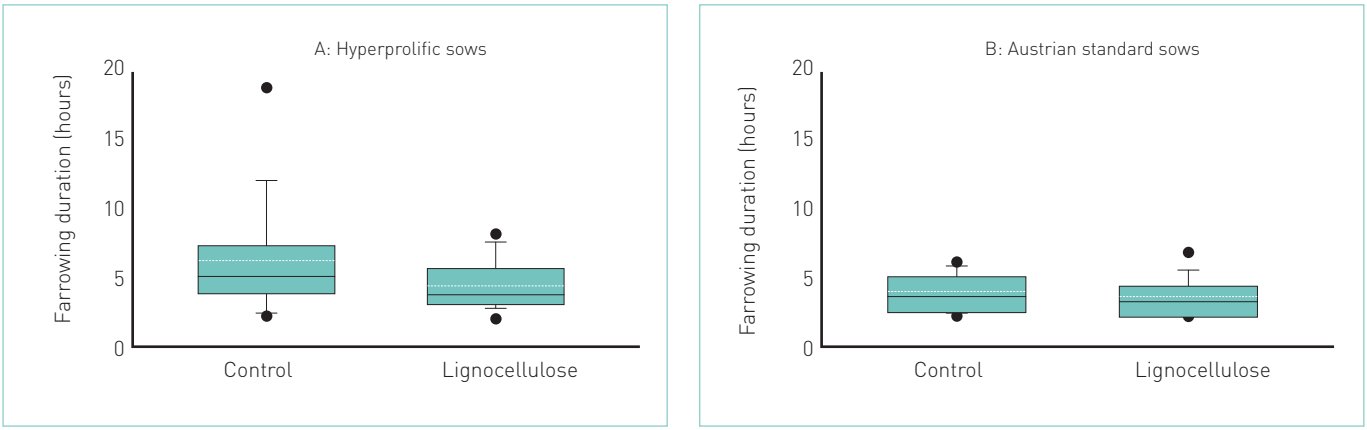
A prolonged farrowing time increases the proportion of stillborn piglets: a birth time extended by 100 minutes means the loss of an additional two piglets and more. Each additional minute of farrowing duration significantly reduces the sow's colostrum yield and a long farrowing, causing hypoxia in piglets, will likely decrease their vitality and chance of surviving.

Additionally, a substantial proportion of sows suffer from low-energy status at the onset of farrowing which prolongs the farrowing process. Hence, when increasing litter sizes, additional tools are needed to compensate for these negative side effects.

A balanced fibre supply turns out to act as a simple and efficient tool to provoke such compensatory effects: Supplementing the sow's diet with dietary fibre offers the opportunity for reducing the farrowing time,

Continued on page 12

Fig. 1. Farrowing duration in (A) highly prolific sows and (B) Austrian standard sows with or without supplementation of eubiotic lignocellulose. Dotted line indicates mean value; black dots indicate min and max values.



Continued from page 11
preventing constipation whilst increasing colostrum intake and performance of the piglets. In general, fibre is considered in the context of avoiding constipation, but offers potential for a specific 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 hindgut. The energy from the enzymatic digestion in the small intestine is available up to five hours after ingestion, while the fermentation products from the hindgut are provided over a period of 24 hours. For the sow this extra energy means the reduction of hunger, stress and, above all, the constant provision of energy for the birthing process.

The energy supply has a strong influence on the duration of the farrowing time, which significantly impacts the number of stillborn and weak piglets.

There is scientific evidence that this reduction of farrowing duration as well as an improvement in number of liveborn piglets can be achieved by a supplementation of eubiotic lignocellulose (LC), which is an insoluble but partly fermentable fibre concentrate.

FIELD STUDY UNDER COMMERCIAL CONDITIONS

A field study conducted under commercial conditions in Austria aimed to compare the impact of LC supplementation on the farrowing process depending on the sows' breeding line. Therefore, highly prolific sows were compared to a local standard breed in two runs: A total of 38 sows (23 Danish genetic vs. 15 standard Austrian genetic [large white x landrace]) and 41 sows (27 Danish genetic vs. 14 Austrian standard) was equally allocated to two treatment groups according to their breed and parity.

	Median of farrowing duration in minutes			
Breeding line	**Control**	**Eubiotic LC**	**Difference**	**p-value**
Highly prolific	323	240	-83 min (-26%)	0.036
Austrian standard	233	210	-23 min (-9%)	0.357

Table 2. Farrowing duration influenced by breeding line and eubiotic lignocellulose supplementation.

The sows in the control group were fed on a diet based on barley, oat and maize, whereas the sows in the test group received the standard gestation diet supplemented with LC (OptiCell, agromed Austria GmbH, Kremsmünster Austria) on top without balancing of nutrients.

The evaluation of the farrowing process influenced by LC supplementation and breeding line, is summarised in Table 1. Both highly prolific sows as well as the standard genetics did benefit from the supplementation of the LC used in this trial, manifested in a reduction of the parturition length.

Moreover, in highly prolific sows the supplementation of lignocellulose increased the number of liveborn piglets per litter from 18.4 to 19.4, whilst lacking this effect for sows with Austrian standard genetics.

As Fig. 1A demonstrates, the supplementation of lignocellulose significantly reduced farrowing duration in highly prolific sows and caused a 26% shortening of the farrowing duration (Table 2). The same effect, albeit to a lesser extent, for sows of standard Austrian genetics is visualised in Fig. 1B.

As hypothesised, the results of this field trial reveal that the positive effect on reducing parturition length has a more pronounced impact in highly prolific sows producing large litter sizes.

Although the reduction in parturition length was less marked in sows of standard genetics, the reduction of farrowing time due to LC supplementation is of physiological importance and improves the welfare of every individual, suffering less from a painful and stressful period.

The results demonstrate a LC-dependent increase of liveborn piglets in highly prolific sows. Again, this finding indicates, that farms housing highly prolific sows will benefit from the supplementation of eubiotic lignocellulose.

Conclusively, highly prolific sows supplemented with premium quality lignocellulose, as used in this trial, are an efficient tool to cover improved animal welfare and health as well as farms' profitability. ■

References are available on request