

Mitigate the effects of negative energy balance in lactating sows

Modern pork production efficiency is essentially measured by the number of piglets farrowed over the reproductive lifetime of the sow. This relies on a strict timed process to ensure that each sow can deliver more than two full litters a year, whilst accounting for gestation, lactation, weaning and the time required to get a sow back into oestrus and re-bred for a second time. Both the relentless process and the sheer quantity and size of piglets farrowed, as well as the quantity of milk required to feed many piglets places sows under immense metabolic pressure.

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Within the reproductive cycle, lactation is the most demanding phase for the sow, resulting in a requirement of approximately three times the energy requirements of gestation.

The increase in energy required to meet these demands can often cause them to enter a state of substantial negative energy balance (NEB), whereby their energy requirements exceed nutrient intake.

When a state of NEB is entered, the nutrient deficiency will be compensated via the use of body reserve mobilisation of fat and protein.

The result of this is often substantial weight and back fat loss as well as reduced reproductive performance. In addition, there is

Treatment	Number of sows	Piglets born/litter	Piglets weaned/litter	Mortality (%)	Weaning weight (kg)	Piglet ADG (g)	Pens with diarrhoea
Control	160	12.67	11.9	6.56	5.29 ^b	181	2.96
LEX	160	13.14	12.4	5.59	5.47 ^a	187	2.25
Difference		+0.47	+0.57	-0.97	+180g	+6g	–
SEM	-	0.937	0.445	0.618	0.044	0.004	0.365
P-value	-	0.1428	0.1294	0.292	0.0118	0.372	0.1995

Table 2. Piglet data combined for both feeding systems.

also a substantial knock-on effect on the progeny with piglet weaning weights and vitality often being reduced.

Nutrient absorption enhancer

LYSOFORTE EXTEND (LEX) is a new generation nutrient absorption enhancer, which combines lysophospholipids and additional synergistic molecules including monoglycerides and synthetic emulsifiers. The use of LEX plays an important role in animal nutrition and feed cost reduction strategies.

Supplementing sows with LEX during late gestation and throughout the lactation periods, helps to reduce weight and backfat losses and therefore mitigates the downstream negative effects of NEB, such as increased wean to service intervals (WSI) and reduced litter weights and vitality.

An experiment was carried out to evaluate the effect of LEX when supplemented from day 114 of gestation through to weaning.

A total of 320 healthy sows were selected and randomly allocated to two dietary treatments with either automatic feeders or manual feeders (80 per treatment feeding system) (Table 1).

The trial started on day 114 of gestation (when the sows were transferred to the farrowing rooms) and continued until weaning (22.2 days post-partum).

During the trial, average feed intake, milk production/sow/day (using the equation for milk estimation by Noblet and Etienne, 1989), body condition scoring, piglet mortality, BWG and average weaning weight were recorded.

Results and discussion

Regardless of automatic or manual feeding, sows fed with LEX ate consistently more throughout the

study compared to non-supplemented sows (Fig. 1).

Overall, this resulted in an approximately 12% higher daily feed intake for the sows receiving LEX (Fig. 2).

Furthermore, sows were producing significantly more milk if there was LEX in their diet, whether fed automatically or manually (Fig. 3).

The body condition score results (BCS, visually obtained and graded with a scale of 1-5, where score 1 means very lean and score 5 means very fat), revealed that sows supplemented with LEX showed a statistical trend to 25% less body condition loss than those fed the control treatment (Fig. 4).

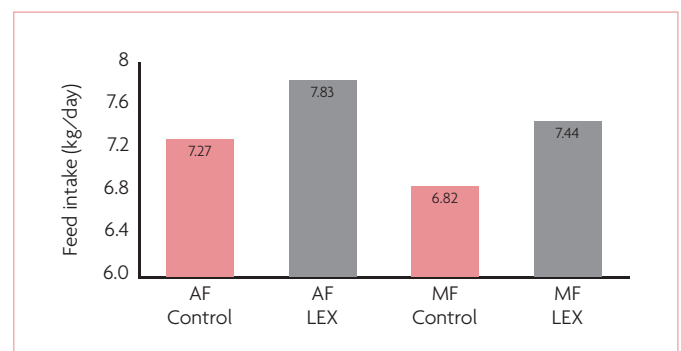
Throughout the study, piglets from sows supplemented with LEX performed numerically better than those of non-LEX fed sows. There was a statistical trend towards a

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Table 1. Description of the experimental treatments.

Housing	Automatic feeders (AF)		Manual feeders (MF)	
Treatment	Control	LEX	Control	LEX
Diets	Standard lactation diets	Control + LEX 750g/t	Standard lactation diets	Control + LEX 750g/t

Fig. 1. Sow feed intake divided by feeding system.



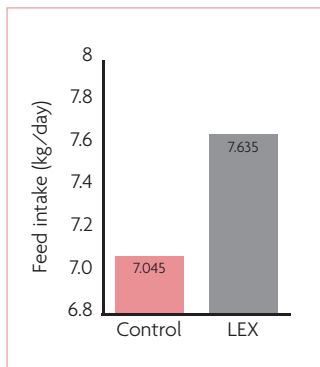


Fig. 2. Overall sow feed intake by treatment.

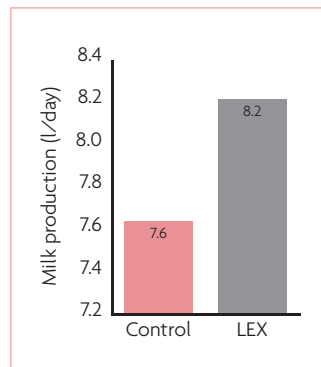


Fig. 3. Overall sow milk production by treatment.

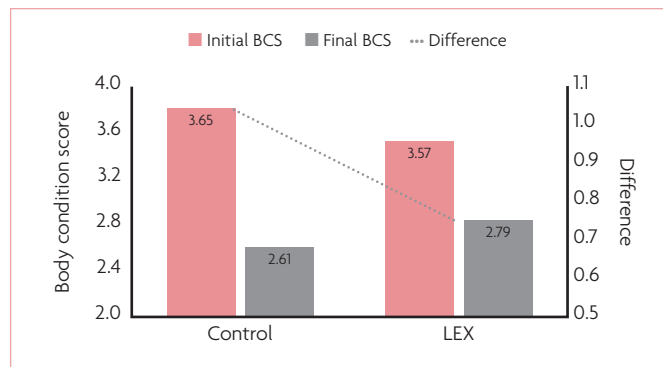


Fig. 4. Overall sow body condition scores by treatment.

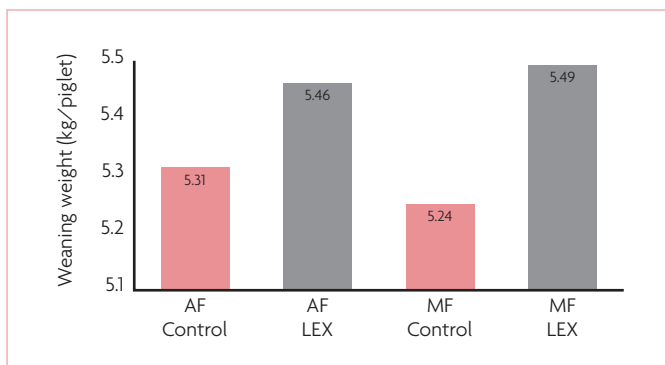


Fig. 5. Weaning weight of the piglets by feeding system. * p<0.01

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reduced incidence of diarrhoea in piglets from sows automatically fed with feed including LEX (Fig. 5).

When combining the data for both feeding systems, the piglets from mothers supplemented with LEX performed consistently better than the control piglets, with a numerical higher ADG, resulting in a statistically significant higher weight at weaning (Table 2, Fig. 6).

The results show that sows supplemented with LEX weaned an additional 0.5 piglets compared to the control (Fig. 7).

Economic analysis

The economic analysis is presented in Table 3. When a standard post weaning to market mortality of 10% is considered, sows supplemented with LEX would produce an additional 0.45 slaughtered pigs per litter.

The average benefit of using LEX is then €0.10/kg of piglet liveweight based on market price conditions in Europe in November 2020, with an average price per kg of liveweight = €1.20, and average cost per kg of liveweight = €1.10 (112kg pig).

The total benefit per 112kg pig slaughtered, would therefore be €11.2 (€0.10/kg of liveweight x 112kg).

The average duration of lactation was 22.2 days. Considering a cost of €0.29/kg lactation feed and the

average feed intake, costs for the LEX treatment were €49.79 and for the control treatment €45.36/sow/litter.

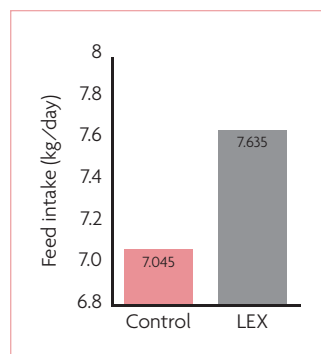
● Additional investment per sow per litter when feeding LEX = €49.79 – €45.36 = €4.43.

Conclusions

Supplementing lactation diets with LEX demonstrated to result in significant benefits for both the sow and her progeny:

- Less loss in body condition and higher feed consumption, which reduces or prevents detrimental effects of entering a state of negative energy balance.
- Higher production of milk, supporting piglet growth which led

Fig. 6. Overall average weaning weight (kg).



	Control	LEX
Average weaning weight (kg)	5.29	5.47
Difference (kg per piglet)		+0.18
Number of days less to slaughter		-1.26*
Average daily feed intake at the end of the fattening period (kg/d)	3	3
Savings in feed intake (kg/pig)		-4.26
Price of finisher feed (€/kg)	0.27	0.27
Feed cost savings (€/pig)		1.15
Average number of piglets weaned/sows		
Potential feed cost savings per litter using LEX		12.41
1.15 x 12.41 x 0.9** = €12.84		
Extra benefit per sow and litter for higher No. of piglets weaned due to LEX inclusion (€)		5.04
Extra income per sow/per year (€)		17.88
Investment in LEX per sow/year (€)		443
ROI		4

* According to Dr. William Close 0.1kg higher weight at weaning results in one day less required to reach target slaughter weight. Considering this documented impact of weaning weight on growth performance in the fattening unit, taking into account only 0.7 days less for this analysis.
** average mortality from weaning to finish.

Table 3. Economic analysis of LEX dry and liquid application.

to higher weaning weights.

● Reduced piglet mortality.

● Higher number of piglets born alive.

● Supplementation of LEX showed a

feed cost saving of €12.84 per litter or a return on investment of four. ■

References are available from the author on request

Fig. 7. Overall number of piglets per sow by treatment.

