Improving diet palatability to stimulate sow feed intake during lactation in summer

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Feed intake during lactation is critical to ensure the sow is able to satisfy the nutritional needs of her growing litter whilst maintaining body condition.

Of the many factors that can limit production efficiency climate can have the greatest influence, particularly during the summer. In heat stress conditions, appetite and voluntary feed intake decreases in order to reduce the thermic effect of feed digestion (TEF). Numerous strategies to alleviate this problem have been explored, such as cooling buildings or animals and increasing diet nutrient density to compensate for reduced feed intake. Improving diet palatability through the addition of flavouring additives also offers the potential to stimulate sow feed intake during this critical period. This study was undertaken to evaluate the supplementation of different levels of a proprietary flavouring (Krave® AP) in diets for sows during lactation and its impact on their productive and reproductive performance.

Materials and methods

A total of 300 mixed parity high-prolific sows (Danbred) were divided into three replicates of 100 sows. Within each replicate, sows were distributed in a completely randomised experimental design among three dietary treatments according to body weight, backfat thickness and parity (1st, 2nd and 3rd – 4th parity) at weaning.

Sows were allocated of three treatments:

T1. Control diet

T2. Control diet + 250g/t Krave® AP

T3. Control diet +500g/t Krave® AP

The sows were individually housed in farrowing crates with controlled access to feed fed at a rate of 2kg for the sow and 0.5kg/piglet and water ad-libitum. Each treatment consisted of 100 repetitions with each animal considered as an experimental unit. Within 48 hours after birth piglets were ear tagged and cross fostered as necessary to standardise litter size

at 15 piglets. Piglets were not offered creep feed during the lactation period.

Daily maximum, minimum, mean, and variance of daily ambient temperature and relative humidity were averaged and analysed for the entire experimental period. Body protein, fat, and energy contents at farrowing and at weaning were estimated according to the equations of Dourmad et al. (1997). Protein, lipid, and energy losses during lactation were estimated as the difference between calculated values determined at farrowing and at weaning. Daily milk production over the lactation period was calculated from litter growth rate, litter size between d 2 and 24, and milk DM using the equation from Noblet and Etienne (1989). The sows' performance and physiological parameters were measured during lactation. Litter parameters were collected at farrowing and at weaning.

Table 1: The impact of Krave® AP on sow and litter performance during lactation

	T1. Control	T2. Krave® AP 250g/t	T3. Krave® AP 500g/t	P
Number of Sows	99	99	98	-
Average Parity	2.45	2.44	2.45	ns
Piglets per litter (after cross fostering)	14.83	14.82	14.80	ns
Lactation duration (days)	23.3	23.4	23.7	ns
Daily Feed Intake	5.08^{c}	6.02^{b}	6.60^{a}	***
Av. piglet weight at birth (kg)	1.39	1.37	1.34	ns
Av. No. of piglets weaned/sow	12.95^{b}	13.07^{ab}	13.45^{a}	*
Av. piglet weight at weaning (kg)	5,86^{c}	6,16^{b}	7,00^{a}	***
Av. Sow milk production (kg/day)	8.59^{b}	9.55^{b}	12.99^{a}	***

Means across rows with different superscript are significantly different ***P<0.001, *P<0.05

Results and discussion

A summary of results is shown in table one.

Average minimum and maximum temperatures and relative humidity levels measured during the experimental period were 32.1 and 16.5℃, and 96.1 and 37.1%, respectively. Litter size was the same at start of trial for all treatments (i.e. 14.83; 14.82 and 14.80, respectively for T1, T2 and T3).

The level of Krave® AP inclusion had significant influence (P<0.05) on feed intake, the feed consumption of T3 sows was higher than T2 and T1 (6.60 vs. 6.02 vs. 5.08 kg d-1, respectively). When compared among sows fed KRAVE® AP, the higher level of inclusion (T3) showed a 9.6% (P<0.05) improvement in feed intake compared with T2 sows. There was no difference in sow body weight loss between the treatments.

As for the litter size at weaning, T3 sows showed a higher (P<0.05) number of weaned piglets when compared to T2 and T1 (13.45 vs. 13.07 vs. 12.95 respectively). There was an effect of treatment (P<0.05) on litter daily gain where litters from T3 sows

showed a higher daily gain when compared to T2 and T1 (3.37 vs. 2.75 vs. 2.58 kg/d respectively). Average weaning weight was also higher for piglets from T3 sows when compared to T2 and T1 (7.00 vs. 6.16 vs. 5.86 kg respectively).

Average daily milk production was 43 % higher ($P<0.05$) in the T3 sows when compared with the T2 and T1 fed sows (12.99 vs. 9.55 vs. 8.59 kg/d). It could be suggested that the increase of milk production is directly connected to an increase of nutrient availability for milk production from feed intake.

Conclusion

Under tropical conditions, lactating sows reduce voluntary feed intake in order to reduce heat production due to the thermic effect of feed; this reduced voluntary feed intake has negative consequences on body reserves mobilisation, milk production, and future reproductive and productive career of the sow. The use of feed flavours may allow an increase in voluntary feed intake and partially attenuate the negative effects of tropical climate on performance of sows and their litters.

This experiment has demonstrated that the strategic use of Krave® AP to stimulate an increase in sow voluntary feed intake can benefit milk production and as a consequence improve litter performance all of which can help attenuate the negative effects of heat stress conditions on the nursing sow.

References available on request from author - simon.eskinazi@adisseo.com