EFFECT OF AMINO ACID INTAKE IN GESTATION ON SOW PERFORMANCE

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Supplementing lysine at more than the recommended rate isn't necessary.

Summary

Proper management of the breeding herd leads to an increase in output of pigs throughout subsequent stages of production. Re-defining amino acid requirements for high producing sows in gestation will lead to maximized productivity and efficiency. Therefore, the effect of lysine level (below and above NRC, 1988) in the gestation diet on sow performance was determined. Total lysine intakes greater than 10.6 g/d (8.3 g Dlys/d) in gestation did not improve sow productivity in the present study.

Introduction

Improved production practices are needed to better suit the capabilities of 'new' high-producing genotypes to ensure their genetic potential is being realized. In particular, nutrient requirements of sows need to be re-defined. Furthermore, these nutrients need to be supplied at the lowest possible cost while minimizing the amount of nutrients being excreted into the manure. The objective of this experiment was to evaluate the effect of two levels of amino acids on sow productivity.

Experimental Procedures

At mating, 419 PIC sows were assigned randomly within parities 1, 2, and 3+ to a gestation diet containing either 0.44 (low lysine) or 0.55% (high lysine) total lysine and 3100 kcal DE/kg; other indispensable amino acids were adjusted to lysine based on ideal protein ratios. The two levels of lysine were set above and below the recommendations of NRC (1988). Feed allowance in gestation was determined factorially using estimated DE requirements for maintenance, maternal gain and conceptus growth. Sows were allowed free access to lactation diet.

Results and Discussion

Sows gained 49.6 ± 0.5 kg in gestation and 4.8 ± 0.6 kg in lactation. Sows farrowed 12.0 ± 0.1 piglets and 11.2 ± 0.1 live born piglets per litter. Gestation lysine level did not affect gestation body weight gain, regardless of parity ($P > 0.10$). Gestation BW gain was affected by parity ($P < 0.05$) as sows of parity 1 and 2 were actually fed to gain more weight than sows of parity 3 and higher ($P < 0.05$; Figure 1). Gestation weight gain was correlated negatively with lactation weight changes ($P < 0.05$). A treatment x parity interaction for backfat was found in lactation ($P < 0.05$), parity 2 sows on the HL gestation diet lost more backfat in lactation than parity 2 sows on the LL gestation diet. The total number of pigs born and the pigs born alive per litter were not affected by gestation lysine level ($P > 0.10$), but were affected by parity with parity 1 sows farrowing fewer piglets ($P < 0.05$). Gestation weight gain and the number and weight of piglets born and born alive were correlated positively ($r = 0.41, 0.40, 0.51, 0.51$ for piglets born per litter, piglets born alive per litter, total weight of the litter and total weight of the piglets born alive, respectively; $P < 0.05$). Every kg BW gain in gestation corresponded to an extra 0.14 piglets born and 0.04 piglets born alive. This resulted in 50 g additional litter weight at birth. Results are summarised in Table 1.

Implications

Feeding sows to meet and not exceed nutrient requirements will lead to increased efficiency and sustainability. For lysine, total intakes greater than 10.6 g/d (8.3g Dlys/d) did not improve sow productivity in the present study, indicating that NRC (1988) recommended lysine requirements met the needs of these sows for maximum productivity.

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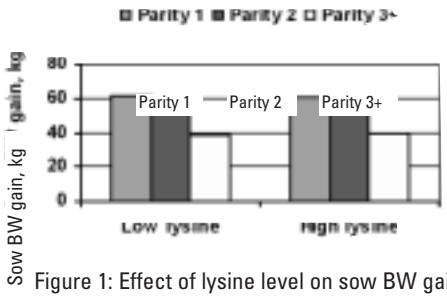

Figure 1: Effect of lysine level on sow BW gain

Low lysine High lysine

Degussa Hüls AG [1]

Table 1. Sow performance in gestation and lactation

Gestation Diet	Parity	LL	HL	Mean	SEM
Sow Traits					
Initial Body Weight (kg)	1	159.2	157.1	158.2	1.6
	2	168.2	168.0	168.1	1.5
	3+	207.9	206.7	207.3	1.1
	Mean	178.4	177.3	177.9	1.8
Body Weight Gain [a]	1	61.7	60.8	61.3	1.2
(day 1 to 110; kg)	2	60.4	59.7	60.1	1.2
	3+	38.3	39.4	38.9	1.3
	Mean	53.5	53.3	53.4	.8
Change in Backfat [b]	1	1.6	2.2	1.9	.4
(day 1 to 110; mm)	2	2.6	1.1	1.9	.3
	3+	2.1	2.0	2.1	.3
	Mean	2.1	1.8	2.0	.2
Weight Change	1	3.0	-1.9	.5	2.0c
(day 1 to weaning; kg)	2	5.9	7.7	6.8	1.5
	3+	6.0	5.5	5.8	1.5
	Mean	5.0	3.8	4.8	1.2a
Initial Backfat (mm)	1	16.4	16.8	16.6	.4
(day 1)	2	16.4	15.9	16.1	.3
	3+	16.3	16.2	16.3	.2
	Mean	16.3	16.3	16.3	.1
Backfat Change	1	-.2	.2	-.1	.3
(day 1to weaning; mm)	2	.2	-.3	0b	.2
	3+	.2	.4	.3	.2
	Mean	.1	.1	.1	.1
Avg. litter size					
Total Born[a]	1	11.9	11.1	11.5	.4
	2	12.0	12.2	12.1	.3
	3+	12.5	12.5	12.5	.3
	Mean	12.1	11.9	12.0	.2
Born alive[a]	1	10.7	10.3	10.5	.4
	2	11.4	11.4	11.4	.3
	3+	11.8	11.9	11.8	.3
	Mean	11.3	11.2	11.2	.2
Avg. litter weights, kg					
Total born[a]	1	16.7	14.9	15.9c	.6
	2	18.4	18.8	18.6	.5
	3+	19.4	19.3	19.4	.4
	Mean	18.2	17.7	18.0	.3
Born alive[a]	1	15.3	14.0	14.7	.6
	2	17.6	18.0	17.8	.5
	3+	18.7	18.6	18.7	.4
	Mean	17.2	16.9	17.1	.3
Avg. piglet birth weights[a]	1	1.48	1.41	1.45	.04
	2	1.61	1.59	1.60	.03
	3+	1.56	1.56	1.56	.03
	Mean	1.55	1.52	1.55	.02

[a] parity effect ($P < .05$). [b] parity x treatment interaction ($P < .05$). [c] Treatment effect ($P < .05$).