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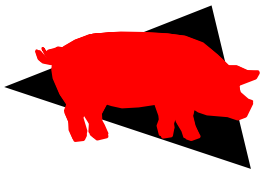
SWINE RESEARCH REPORT 29



L-Valine addition to a practical lactation diet did not improve sow or litter performance

Introduction

In recent years several research reports have shown an increased response in litter growth rate/milk production in lactating sows fed diets with a valine to lysine ratio as high as 1.20:1. This level of valine cannot be achieved in practical US corn-sbm diet formulations without the addition of L-Valine. Most, if not all, of the studies published thus far, have used diets which include high levels of 4 or 5 different crystalline amino acids, which is not economical today. This study was designed to evaluate the potential benefits of the addition of L-Valine in practical lactating sow diets.

Objective

To determine the value of adding crystalline valine to a practical corn-sbm diet for lactating sow.

Experimental Procedures

One hundred seventy nine PIC USA commercial sows (parities 1-4) were allotted to one of 3 dietary treatments. Diets consisted of corn, sbm, 12% wheat midds and each contained 0.05% L-Lysine.HCl (see Table 1). Diets were formulated to contain 0.90% total lysine with the control diet having a total valine:lysine ratio of 0.90; test diets had ratio's of 1.05 and 1.20. Relative concentrations of leucine, isoleucine and other amino acids exceeded NRC (1998) balance relative to lysine. Diets were fed from d 112 of pregnancy through a 19-d lactation. Litter size was standardized 24 hr post-farrow (10.7 ± .2 pigs) and diets were fed *ad libitum.*

Table 1. Experimental Lactation Diets

	Treatments		
	90% V:L*	**105% V:L**	**120% V:L**
Corn	59.720	59.430	59.140
SBM	21.450	21.500	21.550
Wheat Midds	12.00	12.000	12.000
AV – Fat	2.700	2.800	2.900
Dical	2.150	2.150	2.150
VTM	0.750	0.750	0.750
Limestone	0.725	0.725	0.725
Salt	0.455	0.455	0.455
L-Lysine HCl	0.050	0.050	0.050
L-Valine		0.140	0.280
L-Arginine			
	100	100	100

* V:L Valine: Lysine

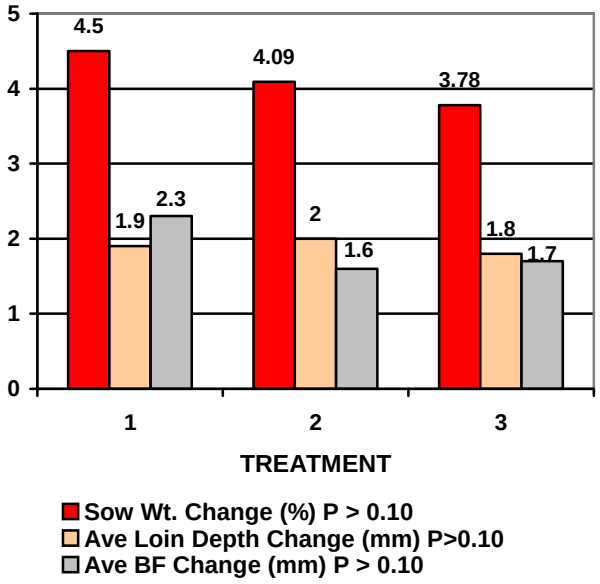
Table 1. Experimental Lactation Diets (continued)

	Treatments		
	90% V:L*	105% V:L	120% V:L
NRC '98 ME (Mcal/lb)	1.516	1.516	1.516
Lysine (%)	.90	.90	.90
Threonine (%)	.66	.66	.66
Valine (%)	.82	.95	1.09
Arginine (%)	1.09	1.09	1.09
Ca (%)	.90	.90	.90
Av. P (%)	.50	.50	.50

* V:L – Valine:Lysine

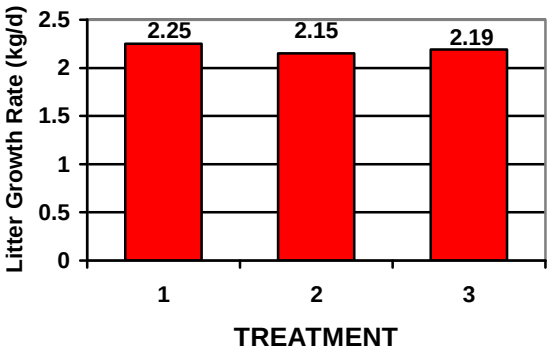
Results

Figure 1. Sow Condition During Lactation



Increasing the valine: lysine ratio in the practical lactation diet did not significantly change sow weight loss, loin depth or backfat (see Figure 1). The number of pigs weaned ranged from 10.0 to 10.2 (P > 0.10). Average feed intake of sows (corrected for assumed 7.5% wastage) was greater than expected and ranged from 6.98 - 7.05 ± 0.15 kg/d (P > 0.10). Calculated dietary lysine intake (61.7 to 62.3 g/d) vs. lysine need suggests that the requirement slightly exceeded intake, which is important when defining ratios to lysine. Loss of loin depth and body weight confirm a negative amino acid balance (Figure 1).

Figure 2. Litter Growth Performance



There were no significant (P > 0.10) differences in litter growth rate (see Figure 2).

A separate analysis of the more vulnerable parity 1 female (14 -15/diet and 178 ± 4.7 kg post farrow bw) showed no differences from the parity 2-4 females. Analysis of weaning to estrus interval and subsequent litter size data also showed no differences.

Conclusion

This study failed to show and advantage in formulating a practical corn-soy diet with valine:lysine ratio > 0.90 : 1.0.

Bibliography

Boyd, R.D., M.E. Johnston, J.L. Usry and K.J. Touchette. 1999. Valine addition to a practical lactation diet did not improve sow performance. Abstract number 108 presented at Midwest Animal Science Meetings, March 16-17, Des Moines, Iowa.