



NUTRITION NOTES

Innovation + Research from Kent Nutrition Group

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EVALUATION OF TRYPTOPHAN-TO-LYSINE RATIOS IN GROW-FINISH PIGS

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Producing lean pork requires the right balance of amino acids in the diet. In grow-finish diets, lysine (Lys) is the first-limiting or essential amino acid (standard) that is required, followed by threonine, methionine and tryptophan (Trp) as other key essential amino acids. The terminology to express amino acid requirements is based on the digestible levels of these amino acids (called standardized ileal digestible or SID) which reflects the amount of each amino acid absorbed and utilized for efficient synthesis of muscle. Amino acid requirements are based on the ratio of these essential amino acids to Lys. In 2011 we evaluated the ratio of SID Trp to SID Lys and observed that the ratios of 16 were adequate (35 replications per treatment) compared to the levels of 18 in pigs that had a growth rate of 1.73 lb/day. However, since 2011 there have been more advances in genetics resulting in faster and leaner pigs that require higher levels of essential amino acids. We now know that these leaner pigs require higher levels of Lys as well as other essential amino acids. So in this trial, we re-evaluated the SID Trp to SID Lys levels to determine if our diets required ratios of 18 which have been reported in the industry to be more optimum with today's genetics. We utilized 1,310 pigs involving 84 replications per treatment with the Control pigs having SID Trp to SID Lys ratios of 16.5 while the treatment with higher levels of synthetic tryptophan had ratios of 18. We used a five-phase program utilizing NexGen VTM 6/5 PT and 200 lb/ton of Distillers Dried Grains with Solubles. The overall performance data are shown below:

Effect Of Sid Tryptophan To Sid Lysine Ratios On Overall Performance, Carcass Traits, And Economics In Grow-Finish Pigs

Treatments	1	2
SID Trp/SID Lys Ratio	16.5	18
Number of Pigs	654	656
Number of Pens	84	84
Initial Wt, lb	38.90	38.96
Days 0-117		
ADG ^b , lb	2.051	2.070
ADF, Lb	5.556	5.546
F/Ga	2.705	2.676
Cost/lb Gain ¹ , ¢	22.22	22.16
Net Return, \$/Pig		
@ \$55/cwt live price ^c	78.60	79.45
@ \$60/cwt live price ^c	90.60	91.56
@ \$65/cwt live price ^b	102.60	103.66
@ \$70/cwt live price ^b	114.60	115.77
Carcass		
Percent Lean	57.00	57.04
Dressing Percent	75.30	75.37
Grade Premium, \$/Cwt	7.00	7.17

^a Trp to lysine ratio effect $P < .05$; ^b Trp to lysine ratio effect $P \leq .08$; ^c Trp to lysine ratio effect $P \leq .09$

¹ Corn, \$3.35/bushel; Soybean Meal, \$290/ton

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NUTRITION NOTES (continued)

Increasing the SID Trp to Lys ratio from 16.5 to 18.0 significantly improved feed efficiency by 0.029 units, which resulted in a cost of gain that was slightly less (22.16 vs. 22.22). Moreover, there was a tendency ($P \leq .08$) for improved gain (2.07 vs. 2.051) for the higher ratio. By having a very large number of pens per treatment, we were able to find very small but important differences between these two ratios of Trp to Lys. In addition, the higher level of Trp to Lys resulted in a much greater net return (value of gain minus feed cost) of \$0.85/hog marketed when using a live price of \$55/cwt. Note that the growth rate of 2.07 lb/day with a percent lean of 57 is very indicative of a very fast growing and efficient hog that is responding to higher levels of Trp compared to what we had tested in 2011.

SUMMARY:

Increasing the SID-Tryptophan-to-SID-Lysine ratios to 18 resulted in a significant improvement in feed efficiency, a trend for greater gain, and higher net returns of around \$1/hog marketed.