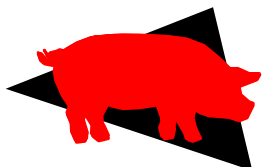


SWINE RESEARCH REPORT 3



PST Treated Pigs Respond to Increased Dietary Lysine Levels

Objective

Determine the lysine requirement of finishing swine injected with PST and to determine its effects on growth and carcass characteristics.

Experimental Procedures

Animals

Seventy-two finishing pigs (36 barrows and 36 gilts) averaging 57.6 kg were allotted on the basis of weight and ancestry to one of six treatments. There were to pigs per pen and six observations per treatment.

Diets

Treatments include either a daily injection of 4 mg PST or placebo, in combination with a pelleted corn-sesame meal diet (.6% lysine) or diets containing .8, 1.0, 1.2 or 1.4% lysine provided by L-Lysine HCl. All diets were formulated to contain at least 200% of NRC (1979) recommendations for other amino acids. Control pigs received a placebo injection and the .6% lysine. Diet. Plasma urea and lysine concentrations were determined on day 28.

Experimental Procedures

Relative to Lysine	Dietary lysine level (%)				
	.6	.8	1.0	1.2	1.4
Lys	100	100	100	100	100
Thr	137	103	82	68	59
Trp	42	31	25	21	18

Table 1. Diet composition

Ingredient	(%)	Calculated Analysis (%)	
Corn	62.25	CP	17.7
Sesame meal	23.40	Lys	.6
Soybean meal (44%)	5.00	Thr	.82
Soybean oil	5.00	Trp	.25
Monocalcium phos	1.29	Ca	1.0
Limestone	.68	P	.8
Salt	.50		
Trace mineral premix ^a	.20		
Vitamin premix ^b	.50		
Selenium premix ^c	.05		
Threonine	.10		
Sucrose/L-Lysine ^d	1.03		
Total	100.0		

^aContained 5.5% Mn, 10% Fe, 1.1% Cu, 20% Zn, 0.15% I and 0.1% Co

^bEach lb of premix contained the following: Vitamin A 800,000 IU, Vitamin D 60,000 IU, Vitamin E 4,000 IU, Riboflavin 900 mg, d-pantothenic acid 24.0g, Choline chloride 92.2g, Niacin 5.0g, B₁₂ 4.4 mg, Menadione dimethylpyrimidinol bisulfate 331 mg

^cContained 90 mg Se/lb premix

^dSucrose was replaced by L-Lys HCl to provide dietary lysine levels of .8, 1.0, 1.2 and 1.4%

Lysine (%)	.60	.60	.70	1.0	1.2	1.4
PST	-	+	+	+	+	+
ADG (kg) ^{ab}	.90	.75	.97	1.16	1.20	1.16
ADFI	2.77	2.26	2.46	2.51	2.47	2.40
F/G ^{ab}	3.07	3.03	2.54	2.18	2.07	2.08

^aLinear effect of lysine (p<.01)

^bQuadratic effect of lysine (P<.01)

Lysine (%)	.60	.60	.80	1.0	1.2	1.4
PST	-	+	+	+	+	+
Adj. backfat thickness (cm)	2.59	2.16	2.13	2.29	2.16	2.26
LEA area (cm) ² ^{ab}	31.90	31.40	39.10	40.50	42.30	42.50
Ham wt, (kg) ^{ab}	6.92	6.94	7.76	7.95	7.89	7.82
Loin wt. (kg) ^{ab}	6.79	6.44	7.06	7.35	7.13	7.25
Kidney fat, (kg) ^a	1.45	1.32	1.15	0.88	0.94	0.83
Urea (ml/dl) ^a	32.10	29.30	23.10	17.90	16.10	13.70
Lysine (ml/dl) ^{ab}	0.99	0.72	0.86	1.08	1.92	3.36

^aLinear effect of lysine (P<.01)
^bQuadratic effect of lysine (P<.01)

Discussion

Increasing levels of dietary lysine resulted in increased average daily gain and improved feed conversion (linear and quadratic, P < .01) for PST treated pigs. Likewise, improving amino acid balance increased performance with best performance observed at an amino acid balance approaching ideal protein. PST treated pigs had less backfat (P<.05) than control pigs. Longissimus muscle area, trimmed increased among PST treated pigs (linear and quadratic, P<.01). Kidney fat decreased (linear, P<.01) with increasing dietary lysine level.

Conclusion

Results indicate a high requirement for lysine and other amino acids in PST treated pigs. Growth performance and carcass traits were optimized at dietary lysine levels of 1.2 to 1.4%, which corresponds to lysine intakes of 30 to 36 grams/day. PST administration nearly doubles the lysine requirement of finishing swine. Recommended amino acid balance for finishing swine should be as follows:

	<u>Relative to lysine</u>
Lysine	100
Threonine	65
Tryptophan	18

Bibliography

Goodband R.D., J.L. Nelssen, R.H. Hines, D.H. Kropf, R.C. Thaler, B.R. Schrick & G.E. Fitzner. 1988. The effects of porcine somatotropin (PST) and dietary lysine level on growth performance and carcass characteristics of finishing swine J. Anim. Sci. 66:59A.