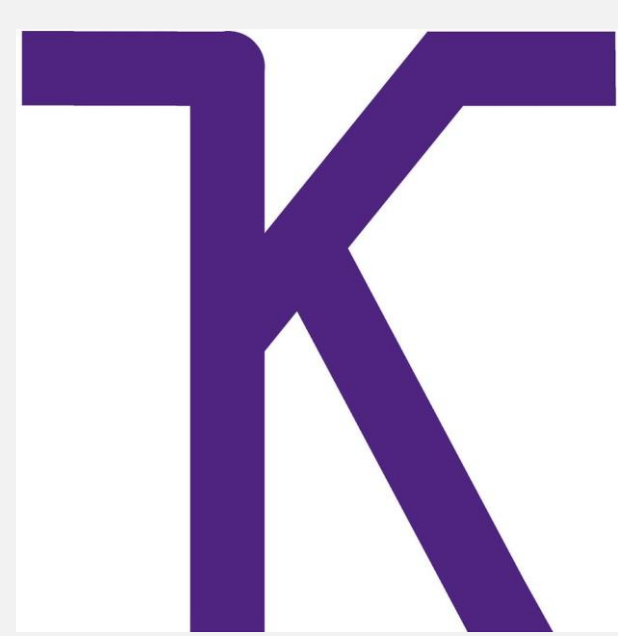
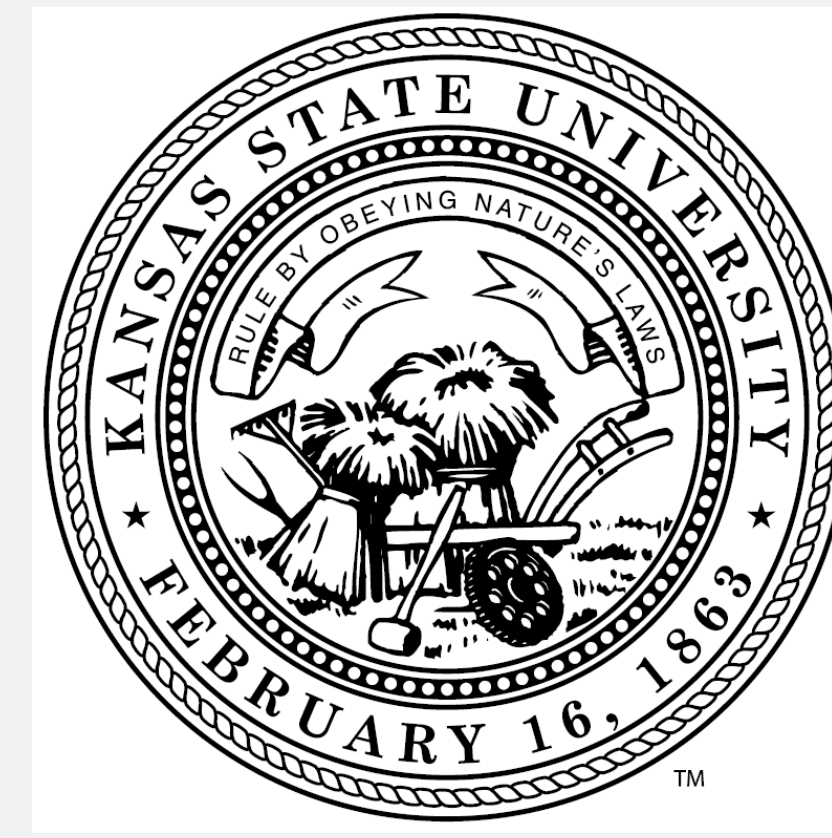




Evaluating the standardized ileal digestible Histidine:Lysine requirement for 15 to 25 lb pigs

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Introduction

- Histidine (His) may be the sixth-limiting amino acid in practical nursery diets formulated with high levels of crystalline amino acids.
- A prior study at KSU demonstrated the SID His:Lys requirement ranged from 29-30%.

Objectives

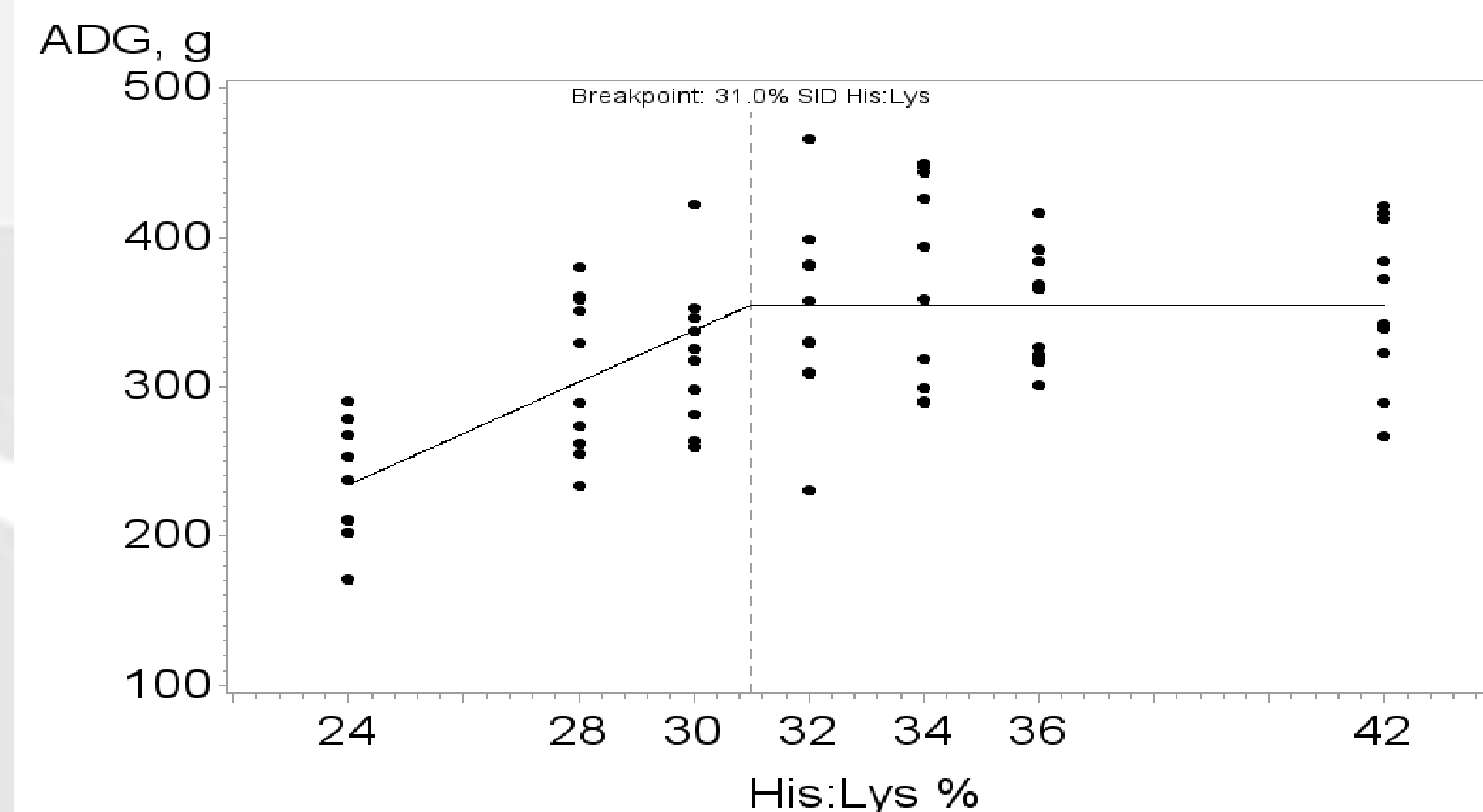
To determine the SID His:Lys requirement of 15 to 25 lb pigs

Experimental Procedures

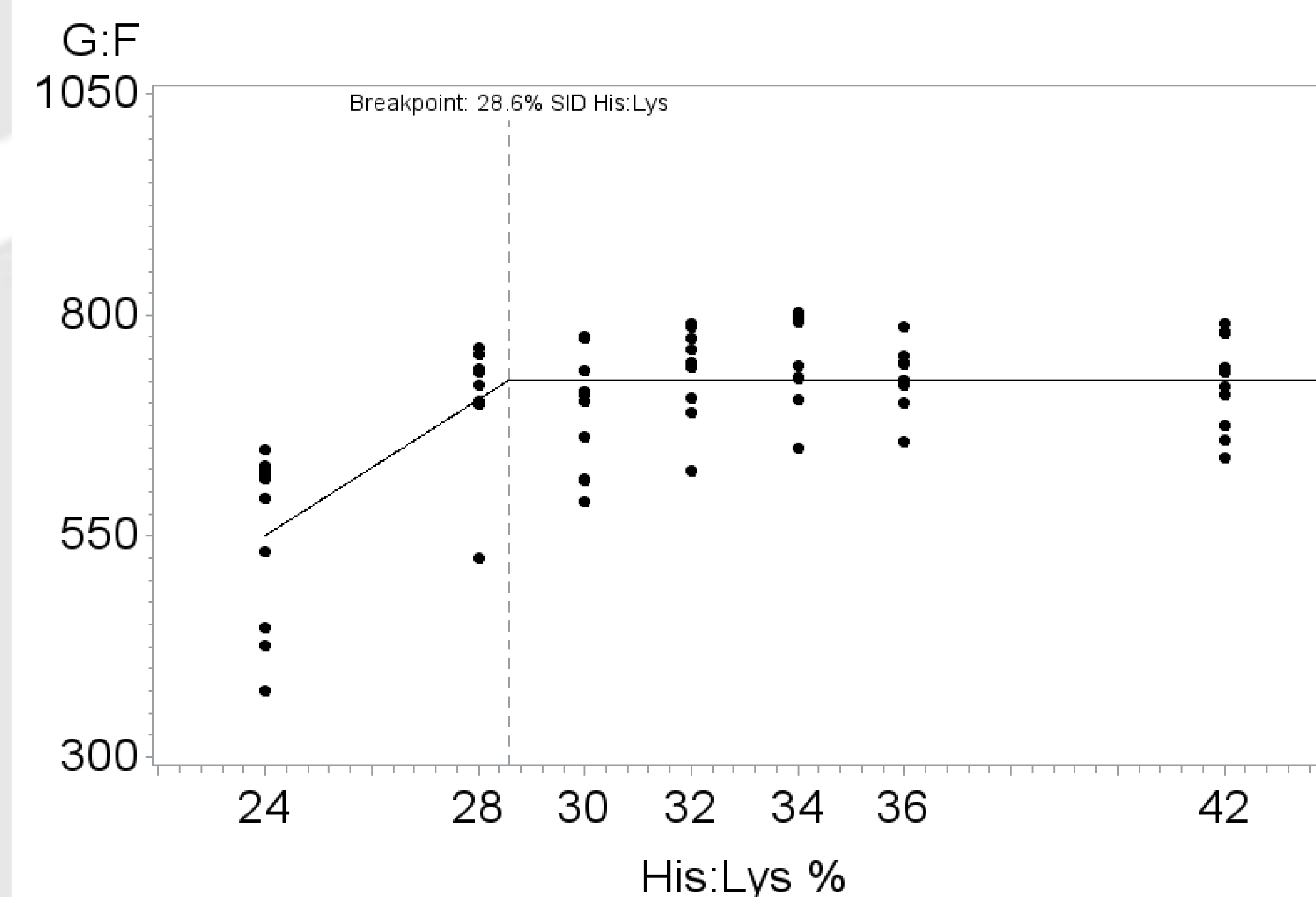
- A total of 350 nursery pigs were placed in pens of 5 pigs/pen.
- Pigs were assigned to treatment in a completely randomized block design.
- Body weight was the blocking factor.
- The pigs were fed a common pelleted diet for 10 d post-weaning (considered d 0) and a common phase 3 diet from d 14 to 28.
- Experimental diets were fed from d 0 to 14. There were 7 treatments replicated 10 times.
- The treatments consisted of increased SID His:Lys ratio of 24%, 28%, 30%, 32%, 34%, 36%, and 42%.
- Pig were weighed and feed disappearance was measured on d 0, 7, 14, 21, and 28.
- ADG, ADFI, and F:G were calculated

Experimental Results

ADG



G:F



Experimental Diets

	24	42	SID amino acids, %	
Corn	60.2	59.97	Lysine	1.25 1.25
Soybean meal	5.63	5.63	Ile:Lys	55 55
Whey Powder	7.25	7.25	Leu:Lys	105 105
Whey Protein Concentrate	7.75	7.75	Met:Lys	39 39
L-Lys-HCL	0.65	0.65	Met&Cys:Lys	60 60
DL-Met	0.24	0.24	Thr:Lys	65 65
L-Thr	0.24	0.24	Trp:Lys	19.8 19.8
L-Trp	0.07	0.07	Val:Lys	70 70
L-Val	0.26	0.26	His:Lys	24 42
L-Ileu	0.14	0.14	Phe&Tyr:Lys	100.1 100
Glutamic acid	1.50	1.50	ME, kcal/lb	1,521 1,518
L-Phenylalanine	0.34	0.34	NE NRC, kcal/lb	1,139 1,137
Glycine	1.50	1.50	CP, %	18.2 18.3
L-His	0	0.23	Ca, %	0.72 0.72
Sucrose	10	10	STTD P with phytase, %	0.52 0.52
Vitamins and Minerals	4.23	4.23	Ca:P	1.24 1.24
TOTAL	100%	100%		

Growth Performance

	SID His:Lys, %							Probability, P <		
	24	28	30	32	34	36	42	SEM	Lin	Quad
ADG, lb	0.51	0.68	0.71	0.77	0.82	0.77	0.79	0.037	0.001	0.001
ADFI, lb	0.94	0.97	1.03	1.04	1.09	1.06	1.09	0.047	0.001	0.168
F/G	1.88	1.43	1.46	1.36	1.33	1.38	1.39	0.059	0.001	0.001
BW, lb										
d 0	14.5	14.5	14.5	14.5	14.5	14.5	14.5	0.789	0.826	0.857
d 14	21.7	24.1	24.3	25.3	26	25.3	25.5	1.267	0.001	0.001

Results and Conclusions

- From d 0 to 14, ADG and F/G improved then plateaued (quadratic, $P<0.001$) and ADFI linearly increased ($P<0.001$) with increasing SID His:Lys.
- The SID His:Lys requirements were estimated at 31% for ADG and 28.6% for F/G.
- From d 14 to 28, the post-test period, ADFI increased (linear, $P=0.003$) and F/G worsened (quadratic, $P=0.002$) in pigs previously fed diets with increasing SID His:Lys.
- The SID His:Lys requirement of 15 to 25 lb pigs ranged from 28.6 to 31%.
- The current NRC (2012) recommendation is 34% SID His:Lys, which is higher than the requirements observed in this study.