

## **Response of growing and finishing pigs to high and low crude protein diets**

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### **Summary**

Supplementing a low protein diet with the limiting amino acids is often more cost effective than using an additional amount of the particular protein source. Two experiments conducted using grower and finisher pigs confirmed that performance could be maintained when either high or low crude protein diets are fed if amino acids are balanced and the diets are formulated to be similar in net energy.

### **Introduction**

Availability of crystalline amino acids has allowed reduction in the crude protein (CP) content of swine diets. Low CP diets supplemented with essential amino acids can decrease nitrogen excretion in the manure and may reduce diet costs. The objective of these experiments was to study the performance of growing and finishing pigs fed high and low CP (4% lower) diets supplemented with crystalline amino acids.

### **Materials and methods**

This work is part of a larger project. The high CP diets were formulated to meet the lysine requirement of the pig (Table 1). Low CP diets were formulated to provide the same amount of lysine but the CP was reduced from 20% to 16% in the grower and from 16% to 12% in the finisher diet. Diets were formulated to be equal in net energy and sodium bicarbonate was added to the low CP diets to maintain the dietary electrolyte balance.

### **Results and discussion**

During the grower experiment, average daily feed intake (ADFI) was numerically reduced when the pigs consumed the high CP diet ( $P = 0.13$ ) and ADG was similar between treatments, resulting in an improved gain:feed ratio with the high CP diet ( $P < 0.01$ ; Table 2). Similarly, low and high CP diets had no effect on pig performance during the finishing phase (Table 2).

### **Conclusion**

Reducing CP levels by 4% in grower and finisher pig diets did not adversely impact performance when diets are formulated to be equivalent in true ideal AA digestibility, NE and dietary electrolyte balance.

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**Table 1. Ingredient composition and calculated nutrient contents of experimental diets**

Ingredients (% As fed)	Grower (25 to 55 kg)		Finisher (75 to 120 kg)	
	High CP	Low CP	High CP	Low CP
Corn	60.50	73.51	77.25	87.80
Soybean meal	34.50	20.80	18.70	7.40
Tallow	1.13	0.00	0.87	0.00
Lysine	0.00	0.43	0.03	0.38
Methionine	0.00	0.11	0.00	0.02
Tryptophan	0.00	0.05	0.00	0.06
Threonine	0.00	0.05	0.00	0.06
Valine	0.00	0.05	0.00	0.03
Isoleucine	0.00	0.00	0.00	0.03
Other <sup>a</sup>	3.87	5.69	3.18	4.80
<b>Nutrients</b>				
DE, Mcal/kg				
NE, Mcal/kg <sup>b</sup>	2.30	2.30	2.40	2.40
Crude protein, %	20.44	16.94	16.13	12.31
Calcium, %	0.70	0.70	0.50	0.52
Phosphorous, % (total)	0.60	0.60	0.45	0.47
TID Lys, %	1.02	1.02	0.66	0.66
TID Met, %	0.29		0.22	0.26
dEB, meq/kg	221	222	145	146

<sup>a</sup> Consisting of dicalcium phosphate, limestone, salt, sodium bicarbonate, potassium carbonate, vitamins, minerals and celite.

<sup>b</sup> Estimated according to CVB (1998).

**Table 2. Performance of grower and finisher pigs fed high or low CP diets.**

	Grower				Finisher			
	High CP	Low CP	SEM	P value	High CP	Low CP	SEM	P value
Initial body weight (kg)	25.28	25.26	0.30	0.98	77.14	77.39	0.88	0.84
Final body weight (kg)	52.79	53.56	1.36	0.70	116.1	113.8	1.83	0.39
ADG (kg/d)	0.98	1.01	0.04	0.67	1.11	1.04	0.10	0.34
ADFI (kg/d)	1.78	2.00	0.10	0.13	3.42	3.30	0.11	0.43
G:F (kg/kg)	0.55	0.51	0.01	0.01	0.32	0.32	0.01	0.51