

Effects of Dietary Protein on Performance of Pigs for Niche Markets: A Summer Trial

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Mark Honeyman, associate dean
Chris Beedle, farm superintendent
Pete Lammers, assistant professor
University of Wisconsin, Platteville

Introduction

Due to increased demand for niche market pork from pigs reared on bedding, more pigs are being produced in alternative housing systems. Many of these systems are bedded hoop barns. Most current swine growth information has been generated in confinement settings. Better characterization of finishing pigs grown in bedded hoop barns and from the genetic lines designed for niche markets will enable more accurate feed formulation for this type of pig raised in bedded housing systems, producing desirable pork for niche markets.

The objective of this study was to increase the intramuscular fat or marbling in pork and monitor the performance of pigs of genetics designed for high value niche markets by feeding lower levels of dietary protein/amino acids. The study was designed to:

1. Generate information on the effects of reduced dietary protein/amino acid levels on performance and intramuscular fat of finishing pigs of niche market genetics reared in bedded hoop barns.
2. Expand understanding of the relationship between rearing environment, dietary protein/amino acid levels, and intramuscular fat in bedded hoop barns.

Materials and Methods

The study consists of two trials in different seasons to quantify the seasonal effects on pig performance with the two dietary

regimens. This report is for the first trial conducted in summer 2017. The trial started in April and ended in August when the pigs were marketed. The trial started when the pigs were 60 lb and assigned to pens. From 60 to 160 lb, all pigs were fed the same diet. At 160 lb, the pigs were assigned to one of the two treatment diets.

All pigs were housed and fed in hoop barns bedded with first wheat straw and later cornstalks. The pigs were a mix of barrows and gilts and were a cross of white line sows on high marbling Duroc boars. Each of the barns was divided into two pens with the dietary treatments assigned to the pens. Pigs were individually tagged and weighed every 28 days to determine growth. Pigs were tracked to the abattoir where meat quality data were collected from their carcasses, including intramuscular fat or marbling levels.

The pigs were fed an ad libitum complete corn-soybean meal diet – either a standard diet or a diet with a reduced level of protein/amino acids in phase from 150 lb until market weight of 290 lb liveweight. Pigs were fed normal levels of SID lysine that met or exceeded NRC requirements or a diet with 16 percent less SID lysine: NE ratio than normal and 10 percent less crude protein: NE ratio than normal.

Results and Discussion

Pig performance is shown in Table 1. There were no differences in pig growth characteristics due to dietary treatment. The carcass quality characteristics are shown in Table 2. There were no effects of the dietary treatment. There were expected differences due to gender, for example the barrows had heavier carcasses.

Table 1. Summary of growth characteristics of pigs fed varying levels of crude protein, summer 2017.¹

	Diet ²		SEM	P-value
	N	LP		Diet
Start weight, lb	59.2	59.4	0.11	0.826
End weight, lb	294.5	287.8	0.71	0.203
ADG, lb/d	2.12	2.06	0.02	0.093
ADFI, lb/d	6.67	6.53	0.13	0.488
F/G, lb/lb	3.15	3.17	0.07	0.737

¹ADG = average daily gain; ADFI = average daily feed intake;
F/G = feed/gain.

²N = pigs fed normal levels of SID Lysine, LP = pigs fed diets delivering 16% less SID Lys: NE ratio than normal and 10% less crude protein: NE ratio than normal.

Table 2. Summary of carcass quality characteristics of pigs fed varying levels of crude protein, summer 2017.

	Diet ¹		Sex		SEM	P-value	
	N	LP	Barrow	Gilt		Diet	Sex
Hot carcass wt., kg	98.2	100.1	102.4	96.0	1.30	0.304	0.002
pH	5.7	5.7	5.7	5.7	0.02	0.660	0.660
CG L*value	53.2	52.6	53.1	52.7	0.50	0.404	0.629
Ham weight, kg	11.8	11.6	11.7	11.3	0.17	0.234	0.119
Belly weight, kg	8.0	8.2	8.3	7.9	0.24	0.496	0.234
Marbling, %	3.0	2.8	2.9	2.9	0.20	0.431	1.000
V Color	3.3	3.5	3.4	3.4	0.12	0.188	1.000
Minolta	54.6	54.2	54.5	54.3	0.50	0.578	0.771

¹N = pigs fed normal levels of SID Lysine, LP = pigs fed diets delivering 16% less SID Lys: NE ratio than normal and 10% less crude protein: NE ratio than normal.