

Effects of Bedding on Pig Performance and Feed Digestibility: Progress Report

A.S. Leaflet R2615

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Summary and Implications

The increased demand for pork, reared in bedded systems, has caused more pigs to be produced in bedded systems such as hoop barns. Much of the current swine nutrition information has been generated in confinement settings without bedding. As omnivores, pigs ingest some bedding. The objectives of the study were to determine the effects of bedding on finishing pigs in bedded hoop barns by: 1) conducting digestibility trials using indigestible markers in the feed, and 2) conducting a growth performance study of pigs with and without bedding in hoop barns.

The trials were conducted during summer 2010 and will continue in 2011 at the ISU Western Research Farm, Castana, IA in three mini-hoop barns each with two pens. Each hoop had one bedded and one non-bedded pen of pigs. Cornstalks were used as bedding. Each pen had a self-feeder with one feeder space and an automatic waterer. The gating between the pens was altered to allow no bedding to pass through.

All pigs on the trials were barrows. There were 2 trials during summer 2010 and there will be 2 trials in summer 2011. There were five pigs per pen starting at approximately 150 lb and fed for 49 days. For the last 14 days of the trials, the feed included titanium oxide as an indigestible marker. After five days on the marker, a fecal grab sample was collected from each pig. Fecal samples were frozen for later analysis of the marker to determine feed digestibility. Because the experiment is not complete, statistical analysis was not conducted; however, the growth feed intake, feed efficiency, backfat thickness and loin muscle area were similar for the barrows with and without bedding during summer months. Feed digestibility values are pending laboratory analysis.

Introduction

Due to the increase in demand for pork reared in bedded systems, more pigs are being produced in bedded systems such as hoop barns. Most of the current swine nutrition information has been generated in confinement settings without bedding. As omnivores, pigs ingest some bedding. There are questions about the effects of the ingested bedding on growth and feed utilization by the

modern market pig. More knowledge in this area will allow for more accurate feed formulation in bedded systems.

The objectives of the study were to determine the effects of bedding on finishing pigs in bedded hoop barns by: 1) conducting digestibility trials using indigestible market in the feed, and 2) conducting a growth performance study with pigs with and without bedding in hoop barns. The two activities will be imbedded in single trials performed four times – in the summer and fall 2010 and again in the summer and fall 2011.

Materials and Methods

The trials were conducted during summer 2010 and will continue in 2011 at the ISU Western Research Farm, Castana, IA in three mini-hoop barns each with two pens with concrete floors. Each hoop had one bedded and one non-bedded pen of pigs. Cornstalks were used as bedding as needed. Each pen had a self-feeder with one feeder space and an automatic waterer. The gating between the pens was altered to allow no bedding to pass through. All pigs on the trials were barrows. There were 2 trials during summer 2010 and there will be 2 trials in summer 2011. There were five pigs per pen starting at approximately 150 lb and fed for 49 days. Thus, when the experiment is complete, there will be four trials of six pens or 24 pens total with five pigs each or 120 pigs total with 12 pens of bedding and 12 pens without bedding. A pen of five pigs is the experimental unit.

The primary treatment is bedding. There were two dietary phases fed in each trial. Phase one for 21 days and phase two for 28 days. All pigs in all pens received the same diets. For the last 14 days of the trials, the feed included titanium oxide as an indigestible marker. After five days on the marker, a fecal grab sample was collected from each pig. Fecal samples were frozen for later analysis of the marker to determine feed digestibility.

At the end of the trial, all pigs were weighed and scanned with ultrasound to determine backfat thickness and loin muscle area.

Apparent nutrient digestibility determination (dry matter, nitrogen, energy, phosphorus), growth (ADG), feed intake (ADFI), feed efficiency (F/G), backfat thickness and loin muscle area were collected.

Results and Discussion

Results of the first two trials are shown in Table 1. Barrows weighing approximately 150 lb were fed for 48 to 49 days with and without bedding. Because the experiment is not complete, statistical analysis was not conducted; however, the growth feed intake, feed efficiency, backfat thickness and loin muscle area were similar for the barrows

Iowa State University Animal Industry Report 2011

with and without bedding during summer months. Feed digestibility values are pending laboratory analysis.

Acknowledgements

The authors acknowledge the assistance of Wayne Rouse, ISU Western Research Farm and Arlie Penner, ISU Department of Animal Science for assistance with the project.

Table 1. Pig performance in hoop barns with and without bedding, 2010 trials.

	Trial 1 ¹		Trial 2 ¹	
	Bedding	No bedding	Bedding	No bedding
Days on test	49	49	48	48
Start weight, lb	149.9	150.3	154.9	154.1
End weight, lb	268.0	268.9	276.9	276.4
Gain, lb	117.9	118.6	122.0	121.3
ADFI, ^{2,3} lb/d	7.19	7.41	8.13	8.03
ADG, ² lb/d	2.41	2.42	2.54	2.55
F/G, ² lb feed/lb gain	2.99	3.07	3.20	3.15
Backfat, in.	0.85	0.82	0.86	0.82
LMA, ² sq. in.	7.25	7.07	7.32	7.49

¹Trial 1 was in May and June, 2010 and Trial 2 was in August and September, 2010.

²ADFI=average daily feed Intake; ADG=average daily gain; F/G=feed-to-gain; LMA=loin muscle area.

³Feed Intake=feed disappearance and does not include bedding.