

Feeding strategies to slow down growth of pigs discussed

By SARAH WEILAND*

IN typical market situations, slowing pig growth or reducing feed intake is not something that those in the swine industry strive to achieve. However, there are times when market or growing conditions dictate the need to limit feed intake and/or reduce growth.

Many producers are experiencing this pressure now due to limited packing capacity caused by the COVID-19 pandemic and its impact on workers at processing plants. There are many diet options to slow pig growth and/or reduce feed intake, but knowing which to choose can be challenging, as researchers tend to focus on technologies that enhance growth.

Fortunately, the Iowa Pork Industry Center and scientists at Iowa State University acted early in the outbreak to put together a project that evaluates the pigs' response to several strategies that slow pig growth and/or reduce feed intake. This article will consider the data reported by the Iowa Pork Industry Center and discuss how producers and swine nutritionists might make use of such implementation.

The project was completed at the Iowa State University Swine Nutrition Farm in Ames, Iowa, using five to six individually penned pigs per treatment. The dietary treatments varied in neutral detergent fiber (NDF), essential amino acid concentrations and calcium chloride levels.

Treatments included:

1. Control;
2. 15% NDF;
3. 20% NDF;
4. 25% NDF;
5. No soybean meal (97% corn);
6. Half the soybean meal of the control (89% corn);
7. Calcium chloride at 4%, and
8. Calcium chloride at 2%.

Pigs remained on the test diets for 28 days, and then all pigs were placed on the control diet to measure any compensatory gain response. The study ended after 42 days from the start of the dietary treatments.

NDF diets

Increasing dietary NDF levels resulted in lower pig bodyweight for the duration

of the trial, but the response was only significant at day 7 within the 15% NDF treatment; no other NDF treatments had a significant impact on pig bodyweight. The average daily gain (ADG) and average daily feed intake (ADFI) responses to increased dietary NDF were highly variable and not significant beyond day 7.

It is also important to remember that this intervention is only an option if high-fiber feedstuffs are available. In the case of COVID-19, nationwide lockdowns reduced fuel demand, resulting in dramatic or complete reductions in production at many ethanol plants, which then greatly reduced the availability of corn dried distillers grains plus solubles, a commonly used high-fiber feedstuff. This made implementation of a higher-fiber diet unlikely and very costly compared to other alternatives available at the same time.

Essential amino acid diets

Diets limiting essential amino acids (89% corn and 97% corn) were formulated by replacing 50% and 100% of soybean meal with corn, respectively. The 89% corn diet did not alter pig bodyweight or performance compared to the control.

The 97% corn diet significantly reduced ADG over the first three weeks of the trial and reduced pig bodyweight in all four weeks but did not significantly affect ADFI or feed efficiency. At the end of the 28-day feeding period, pigs on the 97% corn diet had gained 30 lb., while the control pigs gained approximately 75 lb.

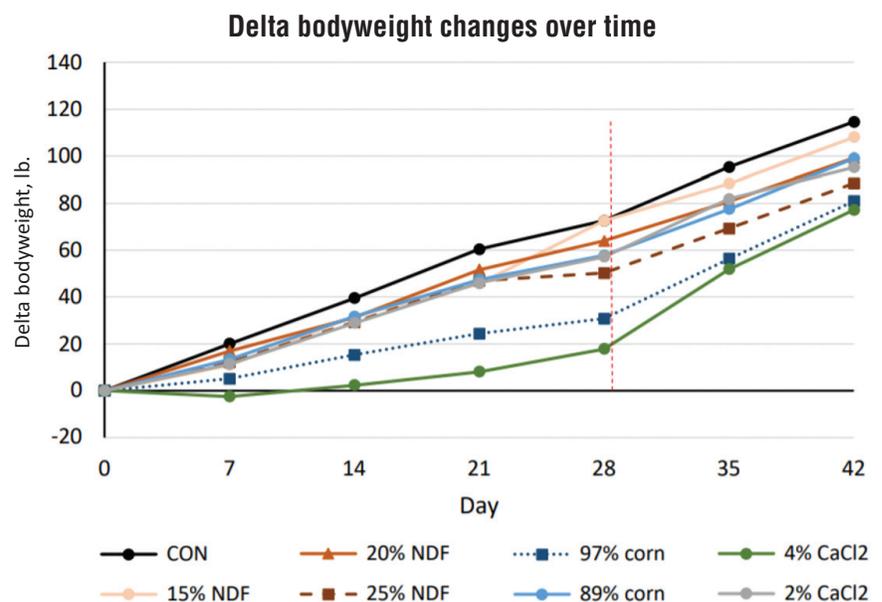
The change in amino acid profile did not affect backfat but did significantly reduce loin eye area due to the change in bodyweight.

One important distinction is that the goal of these diets was for essential amino acids to be lower than the requirement for optimal growth. A 97% corn diet formulated to meet essential amino acid requirements would be expected to have less of an impact on growth rate.

Calcium chloride diets

Both diets containing calcium chloride reduced ADG, ADFI and gain:feed over the first three weeks of the evaluation, but only the diet containing 4% calcium chloride had significant effects on each.

The 2% calcium chloride diet numerically lowered pig bodyweight each week, while the 4% calcium chloride diet significantly reduced pig bodyweight each



Note: All pigs fed control diet after 28 days.

Source: Iowa Pork Industry Center (2020).

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week and resulted in the pigs gaining approximately 16 lb. of bodyweight over the 28-day evaluation.

Calcium chloride was the only intervention that dramatically reduced feed intake, and the decrease was seen immediately in the first week of feeding.

There are some concerns regarding the impact of low mineral consumption and altered dietary undetermined anion concentration on bone health when feeding diets containing calcium chloride, but no such issues were observed in this study. Still, it is important to note that phosphorus was supplemented in these diets to maintain a 2:1 ratio of calcium to standardized total tract digestible phosphorus.

The reduction in growth rate did not alter backfat, but pigs on calcium chloride had significantly reduced loin eye area compared to control pigs; this highlights that lower-bodyweight pigs have smaller loin eye area.

Compensatory gain

Only the 97% corn and the 4% calcium chloride diets significantly differed from the control treatment at day 28. After two weeks with all animals on the con-

trol diet, these two treatments only tended to be different than the control.

In the last two weeks of the study, control pigs gained 42 lb., while pigs fed the 97% corn diet gained 47 lb., and pigs fed 4% calcium chloride gained 60 lb. However, some compensatory gain on the 4% calcium chloride diet may be attributed to increased gut fill and water retention rather than lean growth, according to the researchers.

Implementation

Of all diet options included in this project, the 97% corn and 4% calcium chloride diets had the greatest effect on pig performance. The 97% corn diet decreased pig bodyweight but did not significantly affect ADFI. This presents a viable option for producers if pig growth must be slowed and corn is available on site or can be delivered.

The diet containing 4% calcium chloride decreased ADFI and pig bodyweight, so in cases where feed transportation is disrupted, like weather events, this diet can be used to reduce feed intake and extend the time between feed deliveries while reducing pig growth rate.

The Bottom Line

Each dietary treatment in this study numerically decreased bodyweight over a 28-day period, but only the 97% corn and 4% calcium chloride diets resulted in significant reductions in pig bodyweight. Of these two options, only the 4% calcium chloride diet significantly lowered ADFI each week. Both diets resulted in decreased loin eye area compared to the control. No health issues due to diet were observed in this study.

These data suggest that decreasing essential amino acids and calcium chloride utilization can effectively slow pig growth, and a 4% calcium chloride diet can effectively reduce pig feed intake.

However, the impact of feeding these diets for longer than 28 days has not been determined, and their effect on meat quality had not been reported at the time this article was written.

Reference

Iowa State University-Iowa Pork Industry Center. 2020. Project — Preliminary data: Nutritional approaches to reduce growth rate and feed intake in finishing pigs. Version 5, June 3, 2020. Accessed at www.ipic.iastate.edu/information/NG2005DataSummary.pdf. ■