



Hog Feeder Adjustment – Rosmann Family Farm

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http://bit.ly/pfi_livestock

In a Nutshell

- Organic hogs typically grow slower and are less efficient than conventional hogs. Differences in management may account for some of this.
- The Rosmanns worked with ISU swine specialists to implement three levels of feeder management (once-weekly and twice-daily adjustment, and hand-fed).
- Hogs under once-weekly and twice-daily adjustment had similar growth and production parameters, with a slight advantage to twice-daily.

Key findings:

- Twice-daily adjustment resulted in slightly better feed efficiencies than hogs under once-weekly adjustment. However it required more labor.
- Adjusting feeders more frequently provides some feed cost savings and improves the efficiency of gain in finishing organic hogs.

Project Timeline:

2013

Background

Organic agriculture focuses on preventative, holistic management to ensure livestock health and productivity, rather than feed additives, antimicrobials, and other “chemicals.” When properly managed, the system naturally reduces the incidence of illness and loss from parasites, bacteria, viruses, and other pathogens. Animals are maintained at appropriate stocking densities, are fed quality feedstuffs, and are monitored for signs of disease.

However, organic hogs tend to be less efficient than conventional hogs, requiring additional feed and time to reach finishing weight (Stender and Swantek, personal communication, 2013). Contrib-



Hogs are sorted at the Rosmann farm, near Harlan, Iowa. The Rosmanns implemented three levels of feed management and monitored feed efficiency and animal condition. Photo courtesy of Matt Swantek.

uting factors include breeds and genetics not tailored for extremely high lean gain and fast growth (both desirable attributes for hog production), fibrous (less digestible) diets including small grains and pasture, and exposure to the environment (cold, wet, and/or disease) (Muirhead and Alexander 2013). Management may play a role as well. Organic farms are often highly diversified, requiring labor to be distributed among multiple enterprises at any given time, and certain processes may be hand-operated rather than automated. In conventional hog systems, systems such as feeding may be more automated: feed delivered by pipes or tubes rather than by bucketloads or in a free-choice feeder. This may contribute to differences in feed efficiency of finishing hogs, because of differences in feed wastage. The disparity between feed efficiencies in the two systems may be at least partially due to differences in feed wastage – feed that is lost from the feeder for reasons other than animal consumption.

This trial was designed to determine the effects of feeder management on grow-finish growth performance in finishing organic hogs.

Materials and Methods

Ron Rosmann and his family raise organic crops and livestock near Harlan IA, in Shelby County. The trial, designed by Matt Swantek, included thirty-six finishing hogs (Berkshire, Chester, and Duroc bloodlines) which were weighed and measured for 10th rib backfat. Hogs were divided into six pens consisting of six hogs each. Hog sex was balanced among pens (three barrows and three gilts) and all hogs averaged 133 lb at the start of the trial. Two pens each were assigned to one of three treatments:

1. **Twice-daily** feeder slot adjustment
2. **Once-weekly** feeder slot adjustment
3. Twice-daily hand-feeding of 90% of the previous intake of the twice-daily treatment (**hand-fed**)

A 10- or 12-hole Smidley feeder in each pen was modified so that only two slots were accessible by pigs, which facilitated measurement of feed disappearance. The inside compartment of the feeder was also partitioned to hold about 300 lb of feed. In the twice-daily and once-weekly treatments, feeder slots were tightened or loosened to constrict or ease the flow of feed from the inside compartment into the feeder pan for pigs to eat. The target was to achieve 55% coverage of the bottom of the pan (**Figure 1**), which is based on the recommendations from the 2013 IPPA Regional Swine Conference (van Heugten 1997; Euken 2012). Pan coverage was observed either twice each day (twice-daily treatment) or once each week (once-weekly treatment) and the feeder was adjusted to promote more or less coverage as indicated. The weekly feed consumption of the twice-daily hogs was estimated visually and divided by seven to approximate daily intake. The hand-fed treatment was provided 90% of this amount each day, as 60% in the morning and 30% in the afternoon.

The total amount of feed offered in the twice-daily and once-weekly pens was determined by recording the number of times the inside compartments of the feeders were filled and multiplying that number by 300 lb, knowing that the compartments could each hold about 300 lb. Feed disappearance was calculated by subtracting the amount of feed remaining in the compartments at the end of the trial from the total amount of feed used. In the hand-fed pens, the number and weight of buckets used at each feeding was recorded.

All hogs were weighed and scanned for 10th-rib backfat with a Renco Lean-Meater at the start, approximate midpoint, and end of the trial. The diet was also adjusted at the midpoint to reflect changes in weight and maturity of the hogs (**Table 1**). The total trial period was 56 days (May 2 through June 27; midpoint May 30).

Feed disappearance was divided by the duration of the trial in days to determine average daily feed disappearance (ADFD). The difference between the beginning and ending weights was divided by the duration of the trial to determine average daily gain (ADG). Total feed disappearance was divided by total weight gain to calculate the feed-to-gain ratio.

Results and Discussion

Statistical analyses were unable to be completed due to the small sample size and few replications. Averages of the three pens in each treatment are presented.

Due to miscommunications, the hand-fed pigs received 79% of what the twice-daily treatment received instead of 90%. This likely contributed to performance differences between the groups.

Table 2 displays performance parameters for the hogs in the trial. The average starting and ending hog weights were 133 and 222 lb, respectively. However, final weights differed among treatment groups,

with once-weekly hogs being the heaviest (but very similar to twice-daily) and hand-fed hogs the lightest. Average daily gain (ADG), average daily feed disappearance (ADFD), and backfat followed this trend.

Table 3 shows feed disappearance and efficiency for hogs in the trial. Total and average daily feed disappearance were highest for the once-weekly hogs, intermediate for twice-daily hogs, and lowest for hand-fed hogs. Feed efficiency is evaluated through feed-to-gain ratio, which is determined by dividing the feed consumed by the pounds of liveweight gain of the animals. A lower value is desirable, indicating that the animals required fewer pounds of feed for each pound of gain. Feed-to-gain was lowest for the twice-daily hogs, intermediate (but close) for the once-weekly hogs, and highest for the hand-fed hogs.

Once-weekly hogs likely had the greatest access to feed, since frequent small adjustments were not made to the feeder. This encouraged excess feed disappearance, seen as a greater ADFD. But this disappearance was likely feed wastage more than consumption, as the once-weekly hogs did not gain much more weight than the twice-daily hogs. Other studies have found that hogs given access to more feed consume and gain more, but also waste more (van Heugten 1997). This waste in turn contributed to reduced efficiency of those hogs, seen in the higher feed-to-

Table 1
Composition and nutrient profile for two-phase diets

	Phase 1	Phase 2
Composition (lb)		
Corn	1575	1715
Soybean meal	375	240
Premix	50	45
Total	2000	2000
Nutrient Profile		
Lysine (%)	0.79	0.60
ME (kcal/lb)	1522	1532
Crude protein (%)	15.3	12.8
Fat (%)	5.68	6.11
Calcium (%)	0.61	0.54
Phosphorus (%)	0.57	0.52

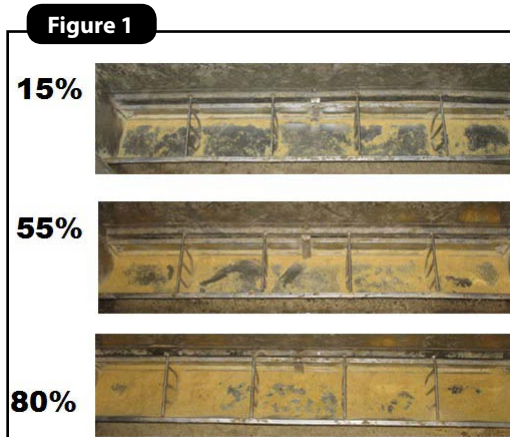


Figure courtesy Goodband et al (2009)

Table 2
Weight, average daily gain (ADG), and backfat measures of hogs managed under three systems.

Treatment	Weight (lb/hog)		ADG (lb/d/hog)	Backfat (in./hog)	
	Initial	Final		Initial	Final
Twice-daily	132.5	230.0	1.74	0.45	0.88
Once-weekly	133.2	232.4	1.77	0.44	0.89
Hand-fed	132.6	203.9	1.27	0.45	0.73

Table 3**Total feed disappearance, average daily feed disappearance (ADFD), and feed-to-gain ratio for hogs managed under three systems**

Treatment	Total feed disappearance (lb/hog)	ADFD (lb/d/hog)	Feed-to-gain ratio
Twice-daily	366	6.52	3.75
Once-weekly	378	6.75	3.81
Hand-fed	287	5.14	4.04

gain ratio.

Hand-fed hogs were to be given 90% of what the twice-daily hogs consumed, in an effort to discourage waste. The less feed available in the pan, the less that can be wasted, and the more likely that hogs will eat rather than play with it. Had this intended level of feeding occurred, the hand-fed pigs should have gained similarly to the other groups while consuming less feed – the feed-to-gain ratio would be lower. However, since feed was inadvertently low, optimal growth and gain of those hogs was not achieved with the hand-fed treatment.

How is this important in the long run? Economically, it can be quite a bit. The difference in ADFD between the once-weekly (6.75 lb/d) and twice-daily (6.52 lb/d) hogs adds up. Over the course of the entire

trial, hogs in the twice-daily treatment consumed 12 lb of feed (4%) less than the once-weekly treatment and the final weight and ADG were 1-2% lower for the twice-daily pens. However, the feed-to-gain ratio was also about 2% less for the twice-daily hogs. The savings in feed with the twice-daily treatment equates to about \$2.75/hog (using Ron's \$429/ton feed cost). This was during the final

two months of growth for these pigs – if implemented early on in the production cycle the savings resulting from the twice-daily treatment would be even bigger. As feed costs rise, particularly for organic and non-GMO ingredients, savings like this will become extremely relevant to producers.

Conclusion

Intensive feeder management for finishing hogs can improve feed efficiency and reduce costs without sacrificing gain. When feeders were adjusted twice each day, feed wastage by hogs was minimized, as evidenced by very similar gains and better feed conversion ratios compared to adjustment once a week. However, restricting feed availability too much limits hog growth and decreases feed efficiency, despite less feed wastage. Future trials

References

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Muirhead, M. R., T. J. Alexander, and J. Carr (Ed). 2013. "Efficient production." In: *Managing Pig Health: A Reference for the Farm*. Accessed online 9 July 2014. <http://www.thepigsite.com/pighealth/article/307/efficient-production>

van Heugten, E. 1997. Feeder management. *Proceedings of the North Carolina Healthy Hogs Seminar*. Accessed online 9 July 2014. http://www.ncsu.edu/project/swine_extension/healthyhogs/book1997/vanheugten1.htm

may investigate intermediate levels of adjustment – perhaps once daily or two or three times weekly – as well as rechecking the hand-fed test.



PFI staff member Margeret (Dunn) Chamas records animal weight data at the Rosmann Farm. Photo courtesy of Matt Swantek.

PFI Cooperators' Program

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