

First Year Experience with Hoophouse Hogs

Steve Weis, Osage

Editors' note: Steve and June Weis, Osage, recently completed a SARE-funded project to document their transition to swine production in hoophouses. (SARE, the Sustainable Agriculture Research and Education program of the USDA, supports producer grants in the North Central Region for projects like this one.) The following is extracted from their final SARE report.

Steve Weis at his June field day



I received a SARE (Sustainable Agriculture Research and Education) grant to look at the differences between our confinement building and our hoop buildings. This is a compilation of what I have noted during this past year.

Construction: The three units were built the summer of 1996. The buildings are from Bio-tech and are each 30 ft. by 72 ft. The company rates them at 200 head each, at 10.8 sq. ft./head. We don't put that many in each, but instead fill them with one farrowing room of pigs, either 15 or 18 stalls. Cost of the buildings came to \$11,200 per building, including fill, water, electricity, and fencing. I do not have an accurate cost on labor since we worked on the project all summer with different family members at different times through the summer. I have talked to several people and would estimate the cost at \$2,000-\$3,000 per building to have someone else build them for you. At 150 head per building, cost is \$75/head, and at 200 head per building cost is \$56 per head.

The cement pad on the south end is 16 feet deep and is raised 1½ feet above dirt level. The cement pad was poured flat, but I wish I had sloped it in toward the bedding slightly to get rid of urine, manure, rain, and melted snow. Some companies recommend sloping the concrete toward the outside of the building, so that if your waterer breaks, the water will run outside the building.

Wayne Fredericks (with microphone) was part of the outdoor panel discussion at Steve and June's field day.



Some people never clean off the cement. This probably has a lot to do with the cement slope and getting the pigs started right when they come into the hoop. We lock our pigs off the cement the first 2-3 nights so they don't sleep on the cement, and also to teach them to dung down in the bedding area when they get up in the morning. The amount of manure that has to be scraped off varies a lot. In most cases it amounts to less than a scoop shovel full. After a rain, it is usually more and sloppier.

Bedding: I have used large round bales of different types of bedding including straw, Japanese millet, corn stalks, and soybean straw. Paper could also be used, but the main idea is to use a bedding that is available to you and is as cheap as possible. I think it is important to have multiple sources of bedding in case something happens that you can't get all your bales baled. (Such as last fall with cornstalks when it was very wet with an early snow and cold.) Ideally, you should store your bales inside for best quality. I think that at a minimum you need to cover your bales to protect them from rain, snow, and ice. Getting your bedding baled has to be a top priority; it isn't something you can put off until later. We've bedded the hoops from both ends, but usually do so from the north end. We use 2-3 people to bed, since I have good help from my two boys; one drives the tractor with bale spear, and two of us move bales in the building. When the pigs are small, we bed once or twice in the first month, then once a week for the next 1½ months, and then two times a week until market time. It takes us 5-10 minutes per bale, depending on the weather. Bedding gets done a lot by looking ahead at the weather and working around the weather, especially in the winter. I have used both small (600-700 lb) and large (900-1000 lb) bales. I definitely like the smaller bales better. You can move them easier and roll them where you want them. You also need to consider that the bales will pick up moisture from rain and snow, and from just sitting on the ground.

Seasonal Changes: We started pigs last December and January in very cold temperatures and had no trouble at all with starting the pigs. This is with pigs coming out of a 65 degree grower unit at 65 pounds. Very little snow blew in, even during blizzards, except for right inside the south gate, where at the worst a 2 foot high drift formed. The bedding area, at worst, received a dusting of snow.

Summer heat is a problem, since you need to concern yourself with the bedding pack giving off heat. In summer the plywood is taken off both ends, and the north curtain is raised all the way up. To cope with the heat on 90+ degree days, I sprayed the manure areas a couple times a day with a hose and spray

nozzle, and also bedded them down more to insulate them from the heat. Some people put up a mister inside the building. Still, the pigs were often fighting to get at the waterer, not so much because they were thirsty, but because they wanted to lay in the water. A two-hole waterer put on each side of the cement pad might prove useful to give the pigs more access to a waterer.

The pigs in the hoops eat more feed than in our confinement building. This seems to be as much as 1 pound more per day per pig. We have been adjusting our rations in the hoops. Except for the heat of the summer, we always run 10% wheat midds in the ration to bulk up the ration. Last winter we upped this to 15% after 125 pounds was reached. We are still adjusting rations, but it looks like we can maybe feed an even less nutrient-dense ration. Ideally, we think we can attain the same ADG in the hoops as in confinement and make the difference in F.E. up by feeding a cheaper ration. We feel that there is still a lot to be learned yet of rations and feeding pigs in hoop buildings.

Table 9. Finishing performance in confinement and hoop structures.

Parameter	Hoop Structures	Confinement Building
Average Daily Gain (lbs. per day)	1.67	1.76
Feed Efficiency (lbs. feed/lb. gain)	3.45	3.25
Death Loss	1.83 %	1.71 %
Finished Weight	250.6 lbs.	254.7 lbs.
Backfat	1.12 inches	1.13 inches
Percent Yield	75.3 %	75.4 %
Avg. Bedding Required	65.3 750-lb bales	
Lung Score †	6.30	6.87
Mange Score ‡	0.13	0.20
Liver White Spots §	0 – 80.3%; 1 – 17.5%; 2 – 2.3%	0 – 98.7%; 1 – 1.3%
Rhinitis ¶	0.87	1.10

† Lung score is the average percent of the lung that is included in the pneumonia process. National average is 7.5%.

‡ Mange is graded on a scale of 0-3, with 3 being the worst. A score of less than 0.5 is desirable.

§ White spots on the liver are scar tissue caused by migrating worm larvae, indicating that worms are or were present in the intestines. Livers are graded from 0-2, with 2 being the worst (10 or more liver spots).

¶ Rhinitis is graded on a scale of 0-5. Five is the worst, indicating severe loss of structures in the nasal passages. The national average is approximately 1.7.

Something I noticed this summer was a possible advantage to not hauling the raw manure right from the hoops to the field. Instead we piled it up to self-compost for 3 weeks or longer. After setting that long, the material has heated up and broken down some more. By piling the manure you can avoid hauling during the winter or while you have crops in the field. You can haul when conditions are right for you. Odor from the hoops is minimal when there are pigs in them. If there is an odor, it probably means you aren't using enough bedding. When the manure is hauled to the field, there is an odor, but definitely less than when hauling liquid manure. I thought flies might be more of a problem with the hoops, but that isn't the case. There was no difference in flies between the confinement building and the hoop buildings.

Production: We tracked production numbers for both the hoops and the confinement building during the past year (see Table 9). Looking at the numbers, you see probably more of a disease effect rather than a building effect. We were hit with PRRS at the start of our study, and that translated into one very poor set of pigs in both the hoops and the confinement building. As we have learned how the cope with PRRS and its side effects, we have gotten better and more reliable data. ADG was less in our hoops than our confinement. I expected this to be closer and it maybe would have been with better health. FE was poorer in the hoops as was expected. With higher consumption you need to compensate by changing the diet fortification and cheapening the diet. Surprisingly, the backfat and yield percentage were very close for both buildings. I expected the hoops to be fatter and lower yielding but that didn't seem to be the case.

All in all, I think hoop buildings have a place on our farm, and probably many other small to mid-size farms. They are versatile, low priced, and low risk. Even if they don't work out for hogs, they can be used for some other livestock or for storage of machinery, bedding, or hay. They also may be revolutionizing the hog industry due to all the versatile ways you can use them, such as for gestating sows or as a farrow to finish unit. Our confinement building is very nice, and we will probably always get better production numbers from it. On the negative side, there is a high capital outlay to build what is essentially a single-use building. Comparing the cost of production between the buildings is hard. With the confinement building, we have a higher capital cost, higher feed cost (due to feeding fat for dust control, micro-aid for odor control, and extra lysine to compensate for lower consumption), and a higher energy cost due to heating during the winter and running the pit fan, feed lines, and curtains. With the hoops we get a poorer ADG and FE, the cost of bedding, and probably a slightly higher labor cost due to the need to bed.