Remodeling Existing Structures

PANEL:
Vern Meyer, retired ISU agricultural engineer
Marty Gingrich, Wellman
Jim Trainer, Northwood
Facilitator: Saqib Mukhtar, ISU Extension Agricultural Engineering Field Specialist

The tape recorder malfunctioned during both concurrent sessions on this topic; thus, the following is based on notes taken during session two. — Ed.

[Introduction of speakers]

Marty grew up in Wellman, Iowa, on his great uncle's hog farm. He purchased a portable nursery, and he uses lean-to's and a shed as breeding areas. His uncle sold the sows after he got started. Now he weans the pigs and takes them to this uncle's site.

Vern worked in Extension for approximately 35 years. He became interested in swine development in the late 1960s, and has a number of ideas on renovation (see handout at the end of this section). His philosophy is that if both the foundation and the roof of a structure are bad, one should try to use it as it is or tear it down.

Jim has a farrowing house, converted cattle sheds, and the like. The farrowing house originally was a nursery, then additions were done to divide it into rooms and pens, so the nursery will hold 475 head. Insulation keeps the heat in for the nursery and the sow rooms, but the walls "sweat."

QUESTIONS AND DISCUSSION

Do you use primarily farm labor or mostly your own?
(Jim:) Mostly our own, though I hired a carpenter who helped with the addition.

What did you do with your nursery? What was it originally?
(Jim:) A grainery, 16'x26', and we dropped the ceiling down and put in insulation, pens south and north, 4'x4' decks, a south room 6'x10', and a 5'x7' deck on top. The cement floor for the hairpin-type gutter is flat, with no slope. The divider wall is about 4" thick, and there's a 3' opening on the end.

When we remodeled the grainery, we added a 12' x 16' office on the southwest corner. We also added a 16' x 40' room on the east side. The original grainery was split into two rooms.
The 16' x 40' addition has a 12' wide, 40' long, 8' deep pit under it with a concrete lid on it. There are 4 shallow pits on top of the deep pit lid. They are 12" deep with pull plugs on both ends dropping into the deep pit. There are six 6'6" x 12' pens on wire above these pits. There are four 4' x 8' decks on top of the 6'6" x 12' pens. There is a 4' high x 8" wide concrete insulated wall all the way around this building. The wall was built by pouring 3" of concrete in the 4' tall forms, letting it set up. We then moved the inside form out and put 2" of styrofoam insulation over the ties, replaced the inside form, and poured 3" more concrete in the form. This is how we constructed the insulated walls.

The smaller rooms have shallow pits running beneath the wire floors connected by PVC pipes to the big pit under the big room. These PVC pipes are controlled by pull plugs also.

We are using the small rooms as a hot nursery. The big room is used for a cold nursery for larger pigs. It has been working very well for us.

I made a slide, and it only gets down about 4 inches. Did you? (Jim:) We left enough in for a slide.

What about cost? (Marty:) We pay about $100 a month rent to house hogs, but each situation is different. It depends on the size of the facility and long-term/short-term facilities, and whether or not I want to plant myself in that community for an extended period of time. Crunching numbers is involved, but there are other factors.

(Vern:) It's difficult to determine the actual cost of remodeling. The contractor makes a rough estimate. But if you do it yourself, you can afford to do it generally.

(audience comment:) Remodeling looks cheap compared to building something new that I can't afford to run.

My finishing barn needs repairs. Everything's good except up top, with the boards (in) a flat spot on the roof. I've got sidewalls, not the regular cement block used today; I've got to do something with the roof because it leaks.

(Vern:) Rafters are a major factor; a building may be old, but rafters can still be strong.

(audience comments) I use my barn for gestation, but the roof needs repair.
I recommend shingles, asphalt and/or steel.

I’ve gotten a variety of estimates.

I’ve got a preference for sheet steel, but I can’t see spending big money for my size of herd.

(Vern:) Steel can rust. One solution is to spray with urethane, a protective coating. It keeps the roof warm, so no condensation builds on the bottom, so there’s no rusting. It keeps the roof rigid, but it costs $2 a square foot. So it’s expensive stuff. I also use coatex rubber buffers to keep birds from tunneling. The life expectancy is 10 years for the coating.

(Vern:) A builder in Chickasaw (County) uses the coating, and it holds up.

Are there other insulation options?
(Vern:) Inside the room, space can be tight. If there’s enough room in the alleyway, use styrofoam or 2”x4” studs to hold insulation. Use reinforced plastic. Remodeling involves trying to keep costs down, so sometimes using cheaper methods can help in the short-term until something better comes along.

Is it better to buy plywood and put up a plastic cover? Or fiberglass?
I used insulated plywood, the thinnest they had that pigs wouldn’t destroy. It’s cheaper than "shower room" plywood.

(Vern:) In northern Iowa, I used to get stuff that they would throw out from an RV factory. Plastic fittings worked well.

Be careful with hollow plywood.

Jim, Marty, what about controlling rodents and birds? Feed management? Outside drainage?
(Jim:) Birds are no problem for me. Styrofoam to keep the buildings from “sweating” (condensating) is helpful.

Any thoughts on tubing?
Be careful with insulation, because of holes. Some wearing can develop. They’ve got to be coated. Steel is not that good, the bars in particular, because of rust and holes.

Is there benefit in having a concrete wall?
(Vern:) I’d go with poured cement myself.
(Jim:) We cut 4 feet off, and didn't lower the roof. My friend poured over the old, but you can't see it from outside. He put new steel on the roof and the side. He utilizes the upper level for straw.

**How did you manage to support (the roof) with the four feet off?**

(Jim:) We put in rods. We've got a fairly big-sized crew to handle barn repair work during the summer.

I don’t necessarily need the loft for straw. I’m wondering if you can successfully put livestock up there.

(Vern:) The only problem is sealing the floor; maybe bedding will help.

On remodeled jobs, you’ll notice that drains and down spouts are missing. People miss those details and risk having thousands of gallons of water damaging the foundation and causing soil erosion.

**Can you raise the skid loaders? The original design was to keep them low, for pigs, and because of heat. What changes would I have to make in raising it up?**

(Vern:) Raising it up might make heat escape. Do something where you can reach in with a rake, though of course it’s not as easy. Some people put feeders right in front and add another 12 feet.

The key is having the right number of hogs in the pen.

We extended ours 16 feet, deeper doors. There’s no problem with the ledge.

Under a certain number of pigs, they start crisscrossing into different sides, marking each others’ territory. The new skidloader can't negotiate separation of pigs. Mine is 12 years old, and the cement is getting shot, although it looked good when I first got it.

**What's the expected life on rerodded (reinforced) slats?**

(Vern:) Some of the early ones didn’t have a good concrete mix, so they corroded. Rerod is better than cables—but some give out after 10 years, and 20 years is probably the best you can get out of them.

**What about pouring onto an existing floor? Are there steps to prevent sweating (my existing floor was) and drainage?**

(Vern:) Some people put plastic down first, then concrete on top.

**What about insulation under the floors?**

(Jim:) We’ve got insulation in my shop.
(Vern:) Insulation can be put along the perimeter, and that helps a lot to keep cold out. I think it’s better and more cost effective to do that. Also, insulation in walls helps prevent condensation.

(Jim:) We poured, using Styrofoam, ties, and 4”x4”s. We used 12” ties—with straps used to hold forms every 2’. Ties are reused; you can push insulation right over ties. Put rerod on the outside.

I've got a good existing cement floor, and I'm thinking of putting in a gutter. How much cement can be run in there to be a better sealant?
(Jim:) We put in 2 inches, 4000 lbs mixed (per square inch strength), and ours hasn't cracked.

At what point do you decide to tear the old floor out?
(Saqib:) Look for obvious cracking, bulging, or undulations. If cracking is bad enough that moisture is seeping in, that would be time to tear the old floor out.

What kind of heaters do you recommend in the nursery?
(Vern:) Radiant heaters are hard to adjust and may cause high levels of carbon monoxide in the room. I’d go with space heaters such as L.B. White.

(audience comment:) Our temperature range has been better with L. B. White. But in colder temperatures, the L.B. White would let heat escape and could not generate heat fast enough.

(Saqib:) That’s a good point about carbon monoxide. OSHA doesn’t recommend (extended) (50 parts per million for eight hours) exposure to carbon monoxide. Purchasing detectors, at $30-40, is probably worth it to animals and house.
SUGGESTIONS FOR RENOVATING BUILDINGS

A. Is it worth remodeling?

1. Look at location first. If it’s too near the house or is south or southwest of the house, it may not be wise to use it for livestock. Be sure it’s not in the way of any future building plans.

2. Look at condition of roof, and foundation. If either needs major repair, use it as is or tear it down.

3. Look at inside posts and what they support. In most cases, pens and stalls can be arranged around existing posts, but they may limit the inside arrangement.

4. Look at ease of insulating and lining. With conventional stud-frame construction, this is easy to do. With posts at odd spacing, this may be difficult and costly.

5. If a concrete floor exists, can it be used as is or with minimum changes?

B. Floor slopes

1. Inside floors with bedding, use 1/4 inch per foot.

2. Inside floors without bedding, use 1/2 inch per foot.

3. Outside feed floor, use 1/2 to 3/4 inch per foot.

4. Keep waterers at lower end of slope if inside the building.

C. Materials

1. Insulation - use blanket or loose fill, protected with 4 mil polyethylene vapor barrier. If barn has a hay mow, use 2 feet of hay or straw over mow floors.

2. Lining - use chip board, plywood, fiberglass, plastic, or painted metal.

3. Floors - use good quality concrete - 3500 psi mix.

4. Partitions - if wood, use oak for long life.
   - if steel, use heavy gauge for long life.
   - concrete for solid partitions is desirable.
D. Windows

1. Use minimum of glass windows in heated building - they lose too much heat in winter. Use insulated panels instead.

2. In some cases, windows can be used for summer ventilation with an insulate panel slipped into the opening for winter.

E. Curtains

1. Consider curtains for finishing building.

2. Uninsulated curtain on the south, insulated curtain on the north.

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