

# Natural ventilation for swine buildings

NEWARK, De. — Many swine producers are looking for ways to reduce energy costs in confinement operations. Natural ventilation may be one way to do this, says University of Delaware extension agricultural engineer James Scarborough.

"Why not investigate natural ventilation to reduce fan and heater operation costs," he suggests. "If your confinement building contains hogs weighing over 80 pounds, this can be used without detrimental effects on the hogs."

Natural ventilation works two ways in a confinement building. First, by wind blowing across an open ridge and drawing out warm moist air which is replaced by fresh air from side vents. Also, when the wind is calm, warm moist air inside the building rises with an effect similar to what occurs in a fireplace chimney.

Temperature can be controlled by opening and closing shutters, curtains or windows as the need dictates. Scarborough says the best natural ventilation systems contain an automatic device controlled by a thermostat to open or shut curtains or shutters.

"As long as the temperature remains between 50 and 80 degrees inside the building," he says, "the hogs will be comfortable. Should it drop below zero degrees outside, you may need supplemental heat, especially if the building is not full. You also can allow the temperature to fall if you feel you can tolerate the drop in production."

Except in the severest weather, he says the inside temperature won't drop below 40 degrees.

In the summer, temperatures above 90 degrees will require some

method of cooling the hogs, such as hourly mistings.

During the three coolest months of the year, the specialist recommends using a supplemental fan to insure adequate fresh air when the building is completely closed, or when high winds preclude the use of natural ven-

tilation because of excessive drafts.

"Adequate insulation is a must in order to maintain a comfortable temperature range for the hogs," he says. "If you're remodeling an existing warm confinement unit, the insulation will be adequate. Don't install a ceiling in the

building, but insulate between the rafters to allow air to flow up to the ridge opening."

He recommends an insulation value of R-8 for the walls and R-14 for the roof. The insulation will control large temperature fluctuations in the building and reduce condensation

"Natural ventilation can be a money saver for your operation during much of the year," Scarborough concludes, "but there's no one set design for a building. You need an experienced and knowledgeable builder to get a properly operating unit."

## First month critical after breeding sow

NEWARK, De. — Breed a good sow at the right time to a fertile boar or two, and the next day there should be 16 to 18 fertilized eggs in her reproductive tract.

But swine producers don't often see litters that size. In fact, there aren't many litters larger than 10 or 12 pigs, says University of Delaware extension livestock specialist Ken Kephart.

Why should this be? "On the average," he says, "40 percent of the embryos die during pregnancy. And about two-thirds of those are lost during the first month. Since these embryos are resorbed by the sow, you never know just how many died."

Research shows that several factors influence these losses, including environmental stress, nutrition, age of the sow, and uterine space. What can producers do to minimize embryonic death? "Treat your sows with a lot of respect — especially during those first 30 days of pregnancy," Kephart says.

Avoid overcrowded conditions, for one thing. Researchers at the University of Illinois Agricultural Experiment Station found that overcrowding pregnant gilts

impairs the process of embryo attachment to the uterine wall.

"Keep your sows cool, too," he says. "It's a fact that subjecting them to heat stress will kill embryos."

Group sows at weaning, not at breeding. If they're mixed at weaning, but the time they come into heat the fighting will be over. That's one less problem for the sow after she's bred. If females need to be regrouped, wait until the second month of pregnancy, the specialist advises.

Nutrition is also important in obtaining large litters. "Provide adequate nutrition, but don't overdo it," Kephart says. "During the first month, it's probably better to underfeed than overfeed. There's little evidence that nutritional deficiencies during this interval will affect embryo viability. But many studies show that full feeding gilts in early pregnancy leads to high prenatal losses."

Age of the sow makes a difference. Older sows generally lose more embryos than gilts, partly because they start with more. But as a sow reaches the end of her productive life, embryonic mor-

tality increases and there's a sharp drop in the number of pigs born — a good sign she needs a new home.

Uterine space is another factor. Even though the uterus can be up to 8 feet long in a large sow, it can maintain only a limited number of pigs. The number of eggs shed can be increased by superovulating the female, but these efforts don't seem to increase litter size at birth.

How many pigs can a uterus support? Two separate studies conducted at the University of Illinois show that the average sow can carry up to 14 pigs before birth weight is significantly affected.

"Since most sows start their

pregnancy with at least 14 embryos, we should be able to approach an average litter size of 14 live pigs," Kephart says. "Currently the national average is about 10. So we have a long way to go."

"To close that gap, we need a major effort from swine managers. We also need more research to answer some of the many questions which remain regarding the sow's reproductive physiology. If we could reduce prenatal losses by half, we could add at least two pigs to every litter," he says. "It's certainly a goal worth working toward."



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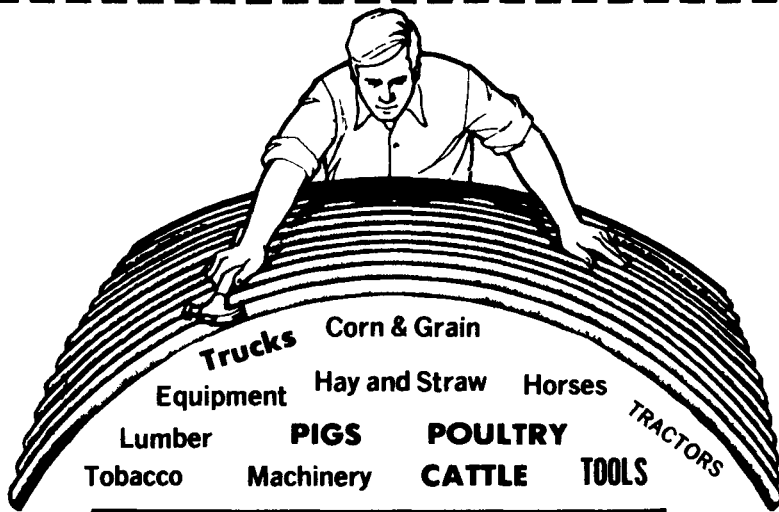
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