



## Drip Cooling of Sows in Farrowing House

Research at Kansas State University indicates that summer heat stress on sows can be reduced by using a system that continually drips water on the sow's shoulder in hot weather.

In this study, the system used was constructed from commercially available drip irrigation equipment sold by some garden supply stores, plant nurseries, or hardware stores. A thermostat and solenoid valve were added for control. A complete system with nozzles, pipe, and controls, designed for farrowing buildings, is also commercially available (figure 1).

In the research study, sows exposed to a temperature of 86°F had a respiration rate of 63 breaths per minute. Sows under the drip system, also at 86°F, had a respiration rate of 30 per minute. Sows ate 2 pounds more feed a day when cooled. Litters from the cooled sows were 11 pounds heavier at weaning than a control group not cooled.

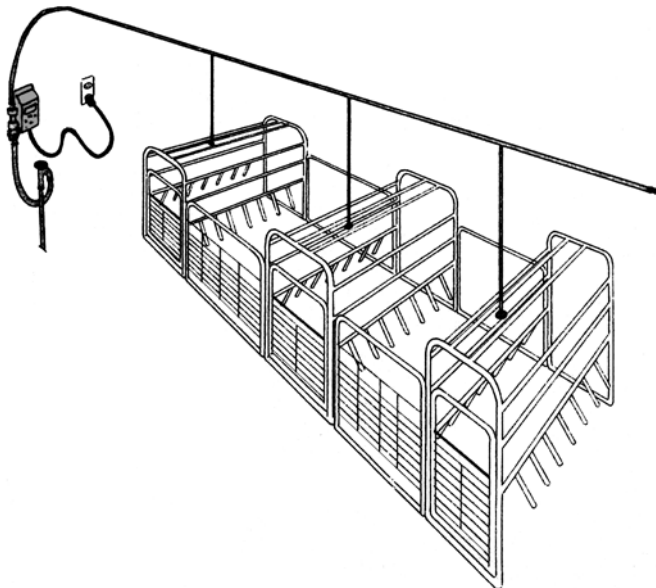


Figure 1. Example of commercially available drip cooling system with nozzles, pipe, and controls.

### Installation

The pipe or tube is installed about 20 inches behind the front headgate of the stall so the dripper wets the shoulder area behind the ear. This area has a high blood flow rate for heat transfer to the skin. The dripper should be far enough back to avoid wetting the feed in the sow's feeder but forward enough to minimize wetting the pigs (see figure 2). Locate it high enough so the sow can't reach it. Select a dripper rated at about 1/2 to 3/4 gallon per hour. The flow rate also is affected by the water system pressure. Some dripper kits contain plastic washers with different size orifices or holes that are used to control pressure and flow at the dripper.

The water line pressure and the number of drippers used on a line determine the size of washer to use. Line pressure can be controlled with a pressure regulator.

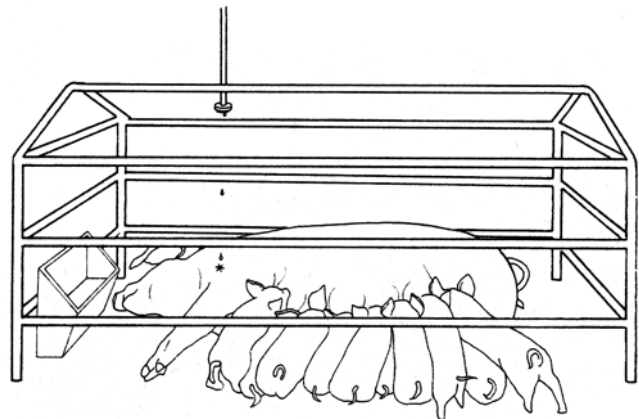


Figure 2. The dripper should be far enough back to avoid wetting the sow's feed but forward enough to minimize wetting the pigs and high enough so the sow can't reach it.

The flow rate of the drippers can be checked by putting a container under the dripper and measuring the output of the dripper for one hour. Or measure for 30 minutes and multiply the amount collected by two to get the rate per hour.

The drippers should be installed so that the lowest point in the line is directly above the sow (figure 3). Otherwise, the water might move down the tube and drip alongside the sow.

### Controlling the Drippers

The dripper system can be controlled automatically with a thermostat and a solenoid valve. Normally the thermostat is set at about 85°F to turn the system on. If the sows experience heat stress at a lower temperature, adjust the thermostat lower. With a rate of 1/2 to 3/4 gallons per hour, the drippers can operate continuously whenever the temperature is above 85°F. Commercial kits contain this equipment. If you put the system together yourself, you can purchase thermostats and solenoids from a heating and plumbing contractor.

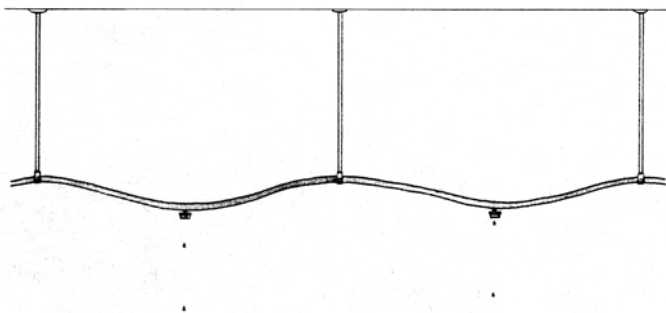


Figure 3. Install the dripper so the lowest point in the line is directly over the center of the farrowing stall.

### Ventilation

With drip cooling, the ventilation rate can be reduced from standard summer rates. Instead of 500 cfm per sow and litter it appears possible to get by with about 250 to 300 cfm. Good air distribution is still required to avoid heat buildup in part of the room.

### Water Filter

A filter should not be needed unless you have rust or foreign material in the water. Observe the drippers for several weeks and recheck the flow rate. If the drippers begin to plug, install a water filter.

If hardness in your water is a problem and residue forms on the drippers, it is usually cheaper to replace the low cost drippers than to treat the water.

### Floor Type

A floor type system works best when the sows are on raised crates with wire mesh or other type of slotted flooring. The floor might remain wet if this system is used on a concrete floor or a bedded floor. The wet floor would increase health problems for the pigs.

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File: Engineering 1

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