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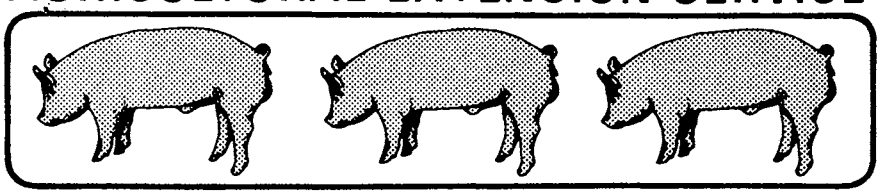

Swine Update

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USING HOVERS IN THE FARROWING ROOM

There has been increased interest in using hovers in farrowing facilities to not only provide a warm environment for baby pigs and avoid chilling, but also to protect them from being crushed by the sow. The use of hovers also has the advantage of providing a closable space to hold baby pigs for processing (cutting needle teeth, castrating, ear notching, etc). Disadvantages include difficulty in building a hover in many conventional farrowing crates and/or pens, plus the inability to sometimes see pigs in some hover designs.

A definition of a hover may be, "an area covered by a solid top with or without sides and with or without supplemental heat". This general definition would cover any of the commercial or home-made hovers in use today in farrowing rooms. There are little design criteria available for building hovers. Space requirements vary from one half ft^2 per piglet at birth up to one ft^2 per piglet at two to three weeks of age. Although many hovers do have rigid sides and a floor, those criteria are not absolutely necessary. The common box hovers are, however, useful in holding piglets for processing or removal from crates. Some hover designs consist of only a top piece of plywood or solid panel, which tends to create a warmer environment by reducing the radiant heat loss of the baby piglets to the room's ceiling and part of the walls. It is also generally agreed that some type of solid flooring is needed in the hover, be it a part of the crate floor or a fiberglass heating pad or sheet of plywood. Some hover designs have used flexible plastic curtain sides to improve and reduce air movement through the hover.

The obvious advantage of using hovers in a crate or pen is that the room temperature can be reduced by 10°F to 15° F (down to 65°F) while maintaining an air temperature of 80° to 90° in and around the baby pigs. This saves energy costs for heat, plus makes a more comfortable environment for the

sow, allowing her to increase feed intake, resulting in better reproductive performance after she weans the pigs. In addition to these advantages, producers who have used hovers have reported less crushing death loss of baby piglets during the first several days after farrowing. The logic behind this is that once the baby pigs know where the hover is located they will go there to sleep and rest after they are done nursing, thus greatly reducing the common problem of baby pigs lying close to the sow to keep warm and thus becoming crushing victims.

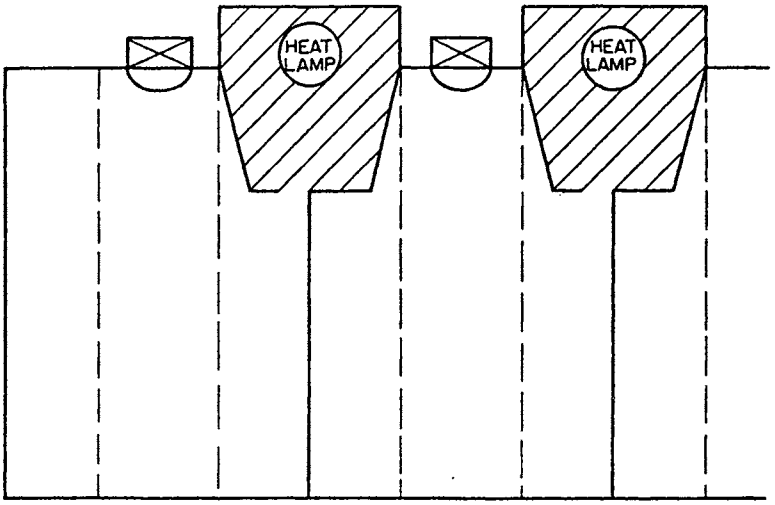
One major disadvantage is extra management time spent during the first day of farrowing to make sure baby piglets find the hover. Another management concern is temperature regulation in the hover making sure that it is not too cool and, maybe more importantly, not too warm for the size and age of the piglets. If an enclosed hover is built, often any supplemental heat can be turned down significantly or removed completely after one to two weeks after farrowing.

Design criteria for hovers are presently being investigated at the University of Minnesota, looking mainly at the radiative heat loss from a baby piglet. Present designs on farms consist of enclosed plywood boxes located in the front and to the side of the sow, wrapped around in the front of the crate, or in between two crates (see figure 1). These designs generally allow from one half to one square foot per pig and have the option of providing heat in the enclosed area. A different design provides a covered top to the conventional creep area heater. This simple plywood cover generally is used with a fiberglass heat pad or solid sheet placed on open flooring to protect the baby pigs from drafts on the underside in raised crates. The design, although not as warm as a box and unable to hold piglets, does have the advantage of direct observation of the baby pigs. Future improvements in designs will result, with hopefully commercially available hovers which can be easily adapted to existing farrowing crates and pens.

REDUCTION IN CORN YIELDS DUE TO KNIFE INJECTIONS OF LIQUID MANURE

The high nitrogen content of liquid manure (either cattle or swine) makes it of potential value for crop production in Minnesota. The efficient use of livestock manures has been restricted by problems with nitrogen loss from surface spreading on cropland. It has been strongly recommended to incorporate liquid manure into the soil to conserve nitrogen in the manure and reduce odor during the spreading process. Recently, in the midwest, there has been cases of yield reduction on cropland which has had liquid manure knifed into the soil. Although not common in Minnesota as yet, other states in the midwest have experienced this phenomena.

At the 1987 Livestock Waste Management Conference held in Champaign, IL, soil scientists reported on the problem in the midwest with reduction of corn yields due to knife injection of liquid manure. Yield decreases of roughly 10-20% has occurred in fields where liquid manure, including wastes from beef, dairy and swine, were knifed into the soil. The problem seems to be associated with poor root growth in and around the concentrated manure zone. Associated with this root inhibitation was a reduction in yield. The problem was reduced by shifting from a vertical (knife) to a horizontal (sweep)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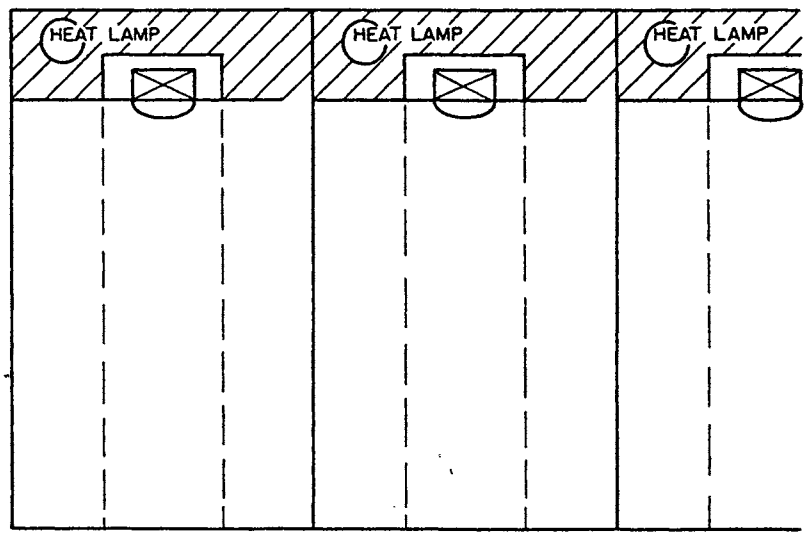
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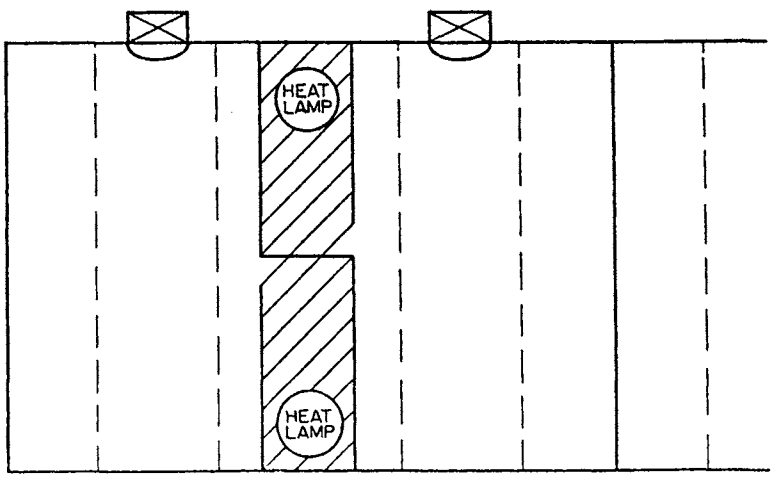
Figure 1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injection technique. Since the problem involves de-nitrification in this area of heavy manure concentrations, use of commercial nitrification inhibitors (i.e. N-serve) with the sweep application did improve yields equivalent to those of commercial fertilizer.

The use of liquid livestock manures will continue in the upper midwest to provide nutrients to growing crops. This is by far the best use of this material from a pollution control standpoint. Incorporation of manure will continue to be stressed, due to the elimination of odor during the application process. Better understanding of the limitations and efficient use of livestock manure in crop production is being researched and applied. Proper techniques such as sweep applicators and the possible use of nitrification inhibitors can make efficient use of this valuable resource produced on our livestock farms.

NEW PIH FOLDER ON "COOLING SWINE"

A new Pork Industry Handbook (PIH) fact sheet entitled "Cooling Swine" is now available through the Communication Resources Bulletin room. This 6 page folder (Ag-FO 2506) discusses the principles of animal heat loss and specific cooling systems. Specifically, nozzle and water line sizes are listed for sprinkler systems, pads and water flow for evaporative wall units, and ventilation rates for uncooled or refrigerated air in zone cooling facilities. This helpful fact sheet can aid in reducing the growth and reproductive problems experienced in Minnesota during the hot summer months.

BUILDING MATERIAL SELECTION FOR USE IN SWINE CONFINEMENT

The selection of construction material in swine confinement facilities is very important from both cost and maintenance standpoints. Materials for feeders, partitions,. wall and ceiling coverings are all very important when either remodeling or building new confinement systems. Independent guidelines are not always available to the producer when selecting equipment and materials for a unit. One useful publication is Extension Folder 373 "Building Materials and Equipment for Swine Facilities," a Pork Industry Handout fact sheet with good information for anyone considering building or remodeling.

Concrete has been recommended for use in livestock facilities and especially swine units for many years. It offers a durability that is almost impossible to match and, although sometimes difficult to install, especially in existing facilities, offers a very effective material for such things as walls and partitions. Cast-in place floors, partition walls and even, in some cases, outside walls, have been used in swine confinement units. We are now seeing more use of concrete in such equipment as feeders and waterers. The major disadvantage is its weight, which makes moving of these materials difficult. Also, there has been some problems with breakdown of the concrete surface due to the acidity of some feed rations.

Steel has and will continue to be used in confinement facilities. It is generally suggested that steel thickness be at least 1/8 inch and possibly to 1/4 inch if it is in a severe corrosion area such as pen partitions. It may be better to

purchase a thicker painted steel component than a comparably priced galvanized steel unit from a durability standpoint. Reducing the number of weld joints and using all stainless steel bolts with self-locking nuts have been recommended by a large commercial hog operator in southern Minnesota.

Probably the largest single material which has been used in the last five years in swine confinement units has been plastic. Plastic partitions, hovers, floors, and even walls have gained popularity in swine facilities, with their major advantage being their noncorrosiveness. Strength of this material especially in shear is still the number one concern of swine producers. The light weight plastic material needs to be fastened to some stationary support members so the material is not allowed to move significantly, resulting in cracking. It also has the advantage of cleaning up well, particularly with a high pressure washer in places where a smooth, hard surface that cannot harbor bacteria is needed, i.e., farrowing and nursery units.

Other traditional materials can still be used successfully in confinement units. Fiberglass laminated to plywood provides an excellent wall if care is taken to protect the joints from pigs and moisture damage. High density floor board sheets can also provide a durable and washable wall surface. Fiberglass gates with stainless steel hardware also works well for nursery and growers pigs. Rough sawed oak planks can be successful pen dividers with over 10 year life spans if secured well to support posts.

One may want to considered, when remodeling or building new swine confinement units, equipment and materials which have approximately the same life span. Presently, a combination of different life spans are often used, resulting in increased installation costs and down time when a major remodeling occurs. Thus, producers may want to build a farrowing unit with all materials lasting 5, 10, or 15 years; then at the end of that time, everything could be replaced rather than intermittently.

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