1963

South Dakota Controlled Environment Poultry Housing

Boyd Bonzer

Louis Lubinus

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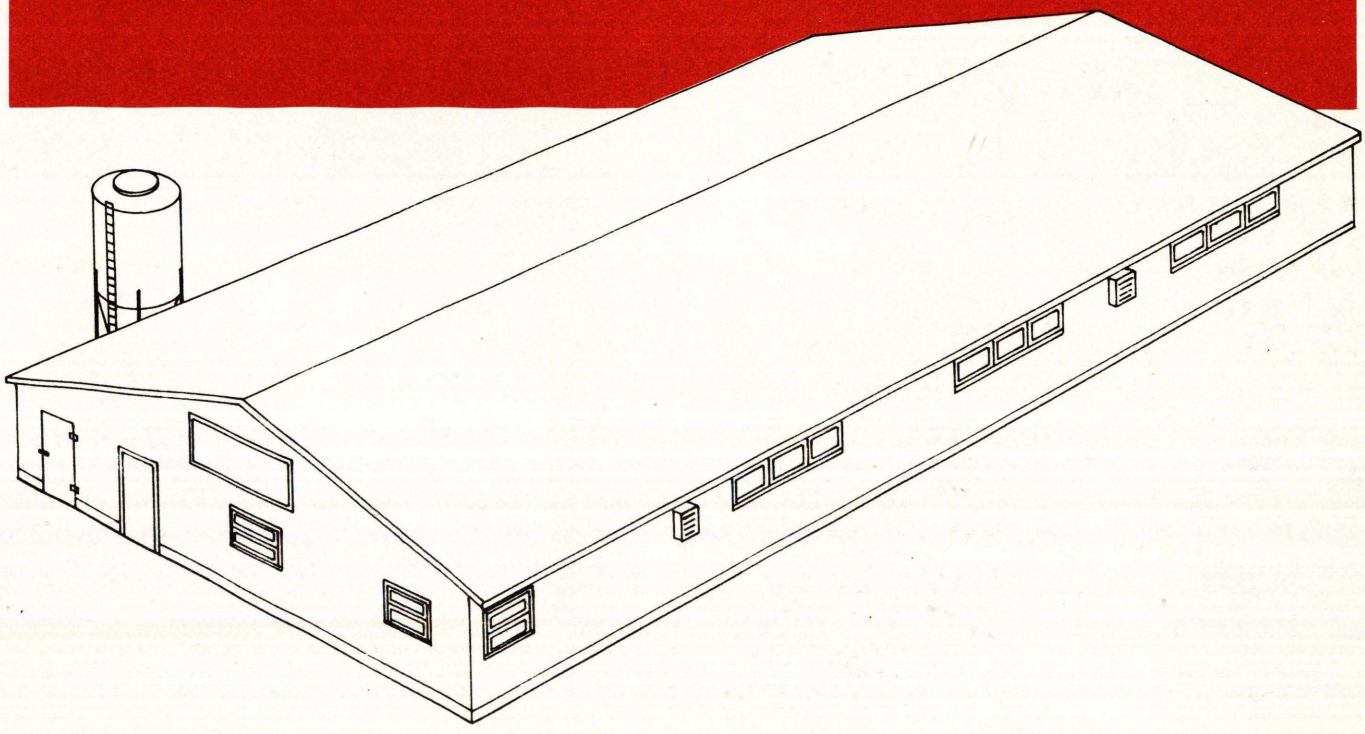
EXTENSION CIRCULAR 627

SOUTH DAKOTA
controlled environment
POULTRY HOUSING



COOPERATIVE EXTENSION SERVICE
SOUTH DAKOTA STATE COLLEGE
U. S. DEPARTMENT OF AGRICULTURE

Authors of this publication are Boyd Bonzer, Extension Poultryman,
and Louis Lubinus, Extension Agricultural Engineer

POULTRY HOUSE PLANS

Poultry house plans are available from the Extension Agricultural Engineer, South Dakota State College, Brookings, S. D., 57007 or through your county extension office. Ask for a plan entitled "36′ Vari-Length Laying House," (8 sheets at a cost of 15c per sheet) or South Dakota Extension Circular 624, "South Dakota Controlled Environment Poultry House," (free copy of laying house plans).

Controlled Environment
Poultry Housing

An efficient, practical poultry house is an asset to a farm. It need not be expensive to give good results. Sometimes a building already on the farm can be remodeled inexpensively to serve the needs of hens; however, for larger flocks seriously consider new housing.

A poultry house must protect the birds from the hot sun in summer, cold temperatures in winter, and temperature extremes in spring and fall. It must also provide for moisture removal and be a comfortable, dry place for the hens. Such a house will increase production, lower feed cost, produce cleaner eggs, and save labor. Other factors for a successful project are egg production breeding, balanced feeding, and efficient management.

To invest money wisely, give careful attention to materials, floor plan, and use of labor-saving devices. Plan a new construction so it could also be used for other farm livestock if the situation would warrant a change of enterprise. Insulation, ventilation, and equipment all are essential for controlled environment poultry housing in South Dakota.

INSULATION

Insulation saves heat for effective ventilation, maintains desirable temperatures, and reduces condensation on the walls and ceiling. The insulation value or rating of a wall or ceiling is determined by adding the *resistance rating* of each component part (table 1) as shown in figure 1.

A resistance rating of 10 is required for the side walls and a rating of 15 for the ceiling in South Dakota. More insulation is required in the ceiling because heat has a tendency to rise. Larger numbers indicate better insulation.

INSULATING THE WALLS

The insulated wall consists of:

Outside sheating and/or siding
Insulation
Vapor Barrier
Inside Sheathing

Table 1. Insulation Resistance Values of Common Building Materials

Material	Thickness in inches	Resistance rating
Air space, ordinary	¾″ or wider	.91
Air space, faced one side with aluminum coated paper, heat flow horizontal	¾″ or wider	1.94*
Air space, faced one side with bright aluminum foil, heat flow horizontal	¾″ or wider	2.64*
Air space, faced one side with aluminum coated paper, heat flow up	¾″ or wider	1.47*
Air space, faced one side with bright aluminum foil, heat flow up	¾″ or wider	1.84*
Air space, faced one side with aluminum coated paper, heat flow down	1½″	3.23*
Air space, faced one side with bright aluminum foil, heat flow down	1½″	5.56*
Asbestos–Cement board	⅛″	.03
Asbestos–Cement board	¼″	.06
Asbestos–Cement board	⅜″	.09
Blankets and batts, general:		
Wood fiber	per inch	4.00
Mineral fiber	per inch	3.70
Glass fiber	per inch	3.70
Brick, common	4″	.80
Concrete Block:		
Sand and gravel aggregate	4″	.71
Sand and gravel aggregate	8″	1.11
Sand and gravel aggregate	12″	1.28
Cinder aggregate	4″	1.11
Cinder aggregate	8″	1.72
Cinder aggregate	12″	1.89
Slag, pumice, or shale, aggregate	4″	1.50
Slag, pumice, or shale, aggregate	8″	2.00
Slag, pumice, or shale, aggregate	12″	2.27
Concrete block, expanded shale, cores filled with insulation as laid	8″	5.88

Table 1. Insulation Resistance Values of Common Building Materials (cont.)

Material	Thickness in inches	Resistance rating
Concrete, gravel aggregate	8″	.64
Fill, insulation:		
Fluffy mineral fiber	1″	3.33
Fluffy mineral fiber	3 5/8″	12.00
Fluffy mineral fiber	5 5/8″	18.70
Vermiculite, (expanded)	1″	2.08
Vermiculite, (expanded)	3 5/8″	7.54
Vermiculite, (expanded)	5 5/8″	11.70
Sawdust or shavings	1″	2.18
Sawdust or shavings	3 5/8″	7.86
Sawdust or shavings	5 5/8″	12.49
Gypsum board	3/8″	.32
Gypsum board	1/2″	.45
Insulation board, typical fiber	1/2″	1.32
Insulation board, typical fiber	25/32″	2.06
Insulation board, typical fiber	1″	2.63
Paper and vapor barriers	0″	.00
Plaster with metal lath (sand aggregate)	3/4″	.13
Plaster with metal lath (lightweight aggregate)	3/4″	.47
Plywood	3/8″	.48
Plywood	1/2″	.64
Plywood	3/4″	.96
Pressed fiber board	1/4″	.18
Roofing roll, 55 (vapor barrier)	1/4″	.15
Sheathing and flooring	3/4″	.94
Sheet rock	3/8″	.32
Shingles, asbestos		.21
Shingles, wood		.94
Siding, drop	3/4″	.79
Siding, lap	1/2″	.81
Stone	16″	1.28
Surface, inside (air film)		.61
Surface, outside (15 mph wind)		.17
Windows:		
Single glass		.10
Single glass with air films, outdoor exposure		.88
Double glass, 1″ spacing		1.88

*These values can be added to insulating values of blanket insulation if faced with reflective surface. Values are given for 30°F. temperature difference across the air space.

Insulation Terms

BTU—British Thermal Unit, a unit of heat energy. A BTU is defined as the amount of heat required to raise the temperature of one pound of water by one degree F. All objects contain some heat, down to absolute zero, which is 460 degrees below zero.

"U" Value—The heat loss, expressed in BTU per hour per square foot of surface, for each degree of temperature difference. This value includes all the heat passing through.

"R" Value—An expression of the insulation resistance of the material. It can be taken as the number of hours required to pass one BTU of heat through one square foot of the material with one-degree temperature difference. The "R" value may be equal to 1/U, 1/k, or 1/c. "R" values are particularly useful because they can be added together to get a total "R" for a wall and converted into BTU per hour or watts heat loss.

Heat Production of Animals, Sensible (available for heating)

Dairy cow, 1000 lb. at 50° F	2550 BTU per hour
Hog, 50 lb.	250 BTU per hour
200 lb.	520 BTU per hour
Hen, 3 lb.	35 BTU per hour
4 lb.	43 BTU per hour
5 lb.	50.4 BTU per hour
6 lb.	57.5 BTU per hour

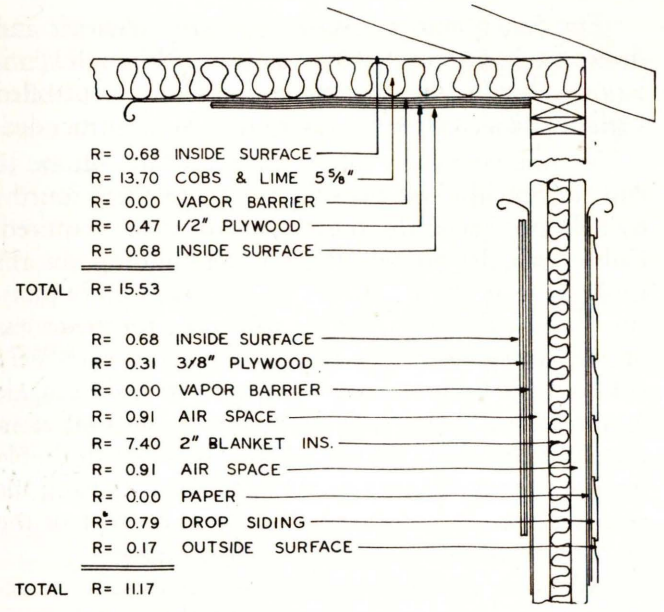


Figure 1. Adding insulation values of the component parts of a ceiling and wall.

Sidewall Insulation

Many producers prefer using a 2- or 3-inch blanket or batt type insulation in the walls because it will not settle and leave areas without protection.

Staple blanket insulation between the studs so there will be an air space on each side when the wall is complete. Then apply the vapor barrier and the inside sheathing (figure 1 and 2).

Vapor Barrier

Suitable vapor barrier materials are: two or four mil polyethylene, two layers of kraft paper with asphalt between, asphalt roll roofing, polyethylene coated paper, aluminum coated paper, and foil.

To be effective insulation must be kept dry, hence the need for a vapor barrier. The vapor barrier is placed between the inside sheathing and the insulation. To be effective it must be continuous. Figure 1 shows proper installation.

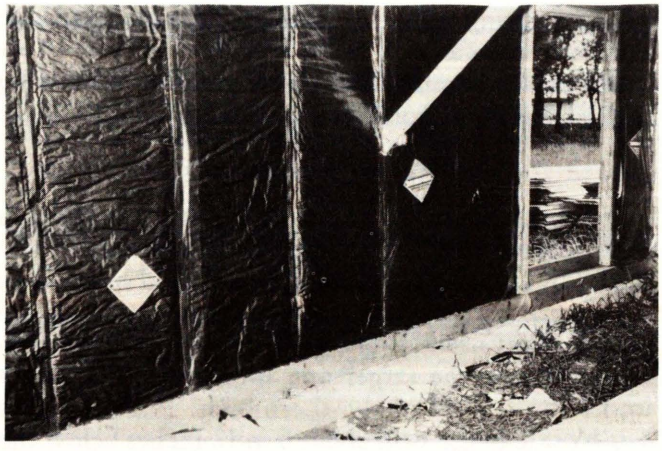


Figure 2. Insulating materials stapled between studdings leaving an air space on both sides. The vapor barrier is placed over the insulation before sheathing is nailed in place.

Building papers such as tar felts and red resin paper are not vapor barriers.

Home Processed Fill Insulation

The walls can be insulated with commercial insulation or home-processed fill such as ground cobs (pea size) and hydrated lime.

About 1 pound of hydrated lime per 10 pounds of home-processed fill is recommended to discourage rodents. Hydrated lime (available at most lumber yards) will be easier to work with if it is added to the home-processed insulation in layers as the wall is filled rather than mixing the two ingredients before putting them in the wall.

Place the vapor barrier on the studding, then cover it with ⅜-inch exterior plywood, number 3 grade or better ship lap, or other suitable sheathing and pour in insulation to fill the wall cavity.

Inside Sheathing

Sheathe the wall with exterior grade, ⅜-inch plywood or lumber to protect the vapor barrier and insulation. Two or three coats of aluminum paint will add to the appearance of the interior of the house and preserve the sheathing material.

INSULATING THE CEILING

An insulated ceiling consists of:

Ceiling Sheathing
Vapor Barrier
Insulation

Fan ventilation requires an insulated ceiling. The ceiling 8 or 9 feet above the floor can be insulated in much the same manner as the wall except more insulation is required. Fill or batt insulation may be more economical than blanket insulation at this location.

Vapor Barrier

Place the vapor barrier on the under side of the ceiling joists before putting the ceiling sheathing in place.

Ceiling Sheathing

Ceiling sheathing should be exterior grade plywood (thickness depending on joist spacing), number 3 ship lap or better lumber, or other suitable sheathing. It must have sufficient strength to support the insulation.

Two or three coats of aluminum paint or other moisture resistant paint on the inside surface will add to the appearance of the house and preserve the sheathing material.

Insulation

Eight to 10 inches of ground corn cobs or other home-processed fill or 4 to 6 inches of commercial blanket or commercial fill are required for the ceiling. Figure the resistance rating of the materials as shown in figure 1.

When home-processed fill is used, spread a layer of lime over the ceiling insulation after it is in place. Work it into the surface with a garden rake.

Outside doors to attic are handy for installing the ceiling insulation. They can also be used for summer ventilation of the attic (figure 9).

INSULATING THE WINDOWS

An insulation job is not complete unless some provision is made for doubling the windows or putting on storm sash in the winter.

Too much window space allows excessive heat loss and adds to the cost of construction. Window opening up to 5% of the floor area is considered reasonable in South Dakota; however, many houses constructed with less than 5% are doing a good job. The "South Dakota Controlled Environment Poultry House Plan" for 5000 birds calls for window and door openings equivalent to about 5% of the floor area.

Houses should have an equal amount of window space on both sides for cross ventilation in the summer.

INSULATING THE DOORS

If doors are not doubled or insulated, water will condense on the inside surface during cold weather and may warp them out of shape.

Double doors not in use by placing a panel of 25/32-inch asphalt impregnated insulation board on the inside of the opening. Protect the insulation board with a layer of hardboard or other hard material where the birds can reach it.

Insulate doors in use by installing a second door or by placing a layer of 25/32-inch asphalt impregnated insulation board on the inside of the door. Sliding doors may require a second door covered with insulating material unless the door is insulated when it is built.

VENTILATION

The ventilating system consists of:

Fans
Fresh air inlets in the ceiling
Attic louvers or openings

Fan or mechanical ventilation assures a positive air displacement from the poultry house when proper equipment is installed. Fans will lend themselves to automatic controls for regulating temperature.

The fan system exhausts moisture laden air and draws fresh, dry air into the building. Although ventilation should be continuous, some controlled variation in air volume being moved is recommended.

Set one-fourth or less of the total fan volume to run continually and regulate the other three-fourths by a thermostat or thermostats to run when required. Cold, fresh, dry air coming into the building absorbs moisture as it warms. It will absorb much more moisture than will mild, fresh air. Only one-fourth or less of the air movement is necessary during extremely cold outside temperatures compared to mild outside temperatures. A single fan system that shuts off completely when the temperature drops is not desirable because it stops the movement of fresh air causing the relative humidity and carbon dioxide content of the air to increase and oxygen level to decrease.

Adequate summer ventilation can usually be accomplished by opening the poultry house windows and doors. Half-inch hardware cloth over the openings keeps chickens in and wild birds and rodents out. During still hot weather use the fans to stir up the air. Here is where turn-about fans are handy.

THE FAN SYSTEM

The fan system should provide a total of 4 cubic feet per minute per bird in the house rated at ⅛-inch static pressure. Turn-about fans are more versatile than conventional fans. One cubic foot per minute at ⅛-inch static pressure per bird should be provided by a small fan or fans and 3 cfm at ⅛-inch static pressure per bird by a larger fan or fans.

In windowless houses increase the fan capacity to 6 cubic feet per minute per bird at ⅛-inch static pressure.

Use the ⅛-inch static pressure rating instead of the free air delivery rating on the fan literature because some resistance develops when air is moved through inlets and against the wind. A ⅛-inch static pressure rating on a fan assures the purchaser that this particular fan will move the stated amount of air when pulling against that much vacuum or blowing into a 15-mile-an-hour wind.

Fans for Small Units

In units below 1500 birds, continuous ventilation with modulation for various conditions can be obtained by using two fans. One fan should have about one-fourth and the other about three-fourths of the total capacity needed. The smaller fan should run continuously and the larger one should run as needed under the control of the thermostat. Place the fans side by side in the wall about 8 to 12 inches below the ceiling. Use cabinets on the fans to draw the cooler air from about 16 inches above the floor. Use a damper in the cabinets to further restrict the air removal

when desired. Cover all openings with ½-inch hardware cloth or netting to keep objects from getting in the fan. Equip all fans with mechanical shutters or louvers and hoods to prevent backdraft when the fans are not operating (figure 3).

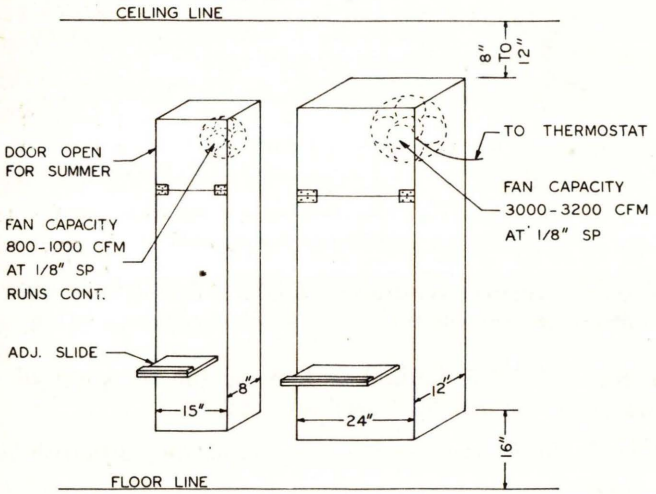


Figure 3. Details of a fan system for 1,000 birds. Note: Fan capacities shown are for 1,000 birds.

Fans for Large Units

In units of more than 1500 birds, the fans can better serve the area if they are placed individually (figure 4) in the two side walls and spaced at regular intervals to divide the wall space into equal parts. Connect a thermostat to each fan. Place the thermostat in the same area as the fan but 10 or 15 feet closer to the center of the house. Adjust the thermostats so air is well distributed. Remember a fan will cause the warm air to move into the area where it is located. About one-fourth of the capacity should run continuously and be dampered down so the house temperature is controlled by additional fans and their thermostats.

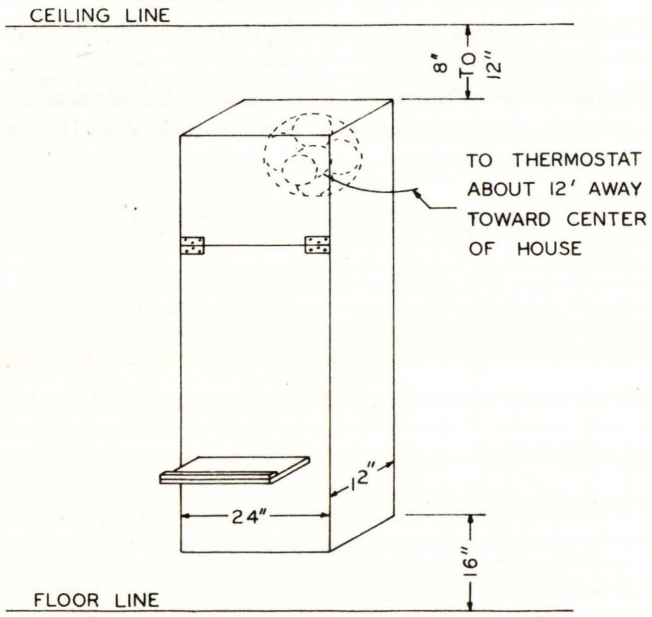


Figure 4. Detail for boxing in the fans in units larger than 1,500 birds.

Locating the Thermostat

Place each thermostat where it will be exposed to the representative room temperature in the house—10 or 15 feet from the fan, about 6 feet from the floor, and 1½ to 2 feet from the ceiling. Keep it away from outside walls, the direct flow of air from the fresh air inlets, and direct sunshine.

Hang the thermostat on a 1 x 4 hinged to the ceiling if it will be in the way while cleaning.

Hang a thermometer with the thermostat.

FRESH AIR INLETS

The house should provide 1 square inch of baffled inlet opening through the ceiling per bird in the house.

During cold and mild weather fresh air can be pulled in through baffled slot inlets through the ceiling and mixed with air in the house with a minimum of draft in any one area (figures 6, 7, and 9). In houses 30 to 40 feet wide, two runs of slot inlet through the ceiling the length of the building space about ⅓ of the distance "in" from the sidewalls are recommended. Stay 8 to 10 feet from the fans with open slot area to facilitate good mixing of air in the room.

On bright, sunny days the fresh air coming in from the attic will be warmed somewhat from the heat of the roof. This provides additional heat in the house so more air can be moved and additional moisture taken out of the house by the ventilating system.

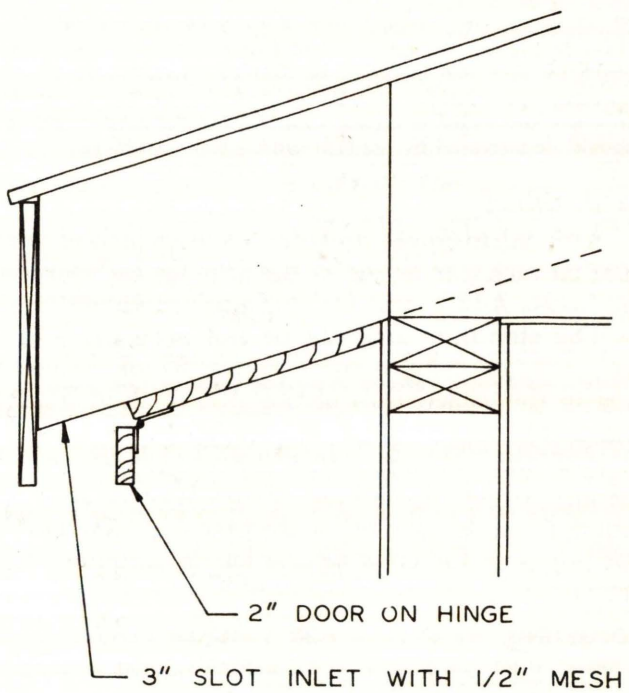


Figure 5. Detail for slot inlet under eaves.

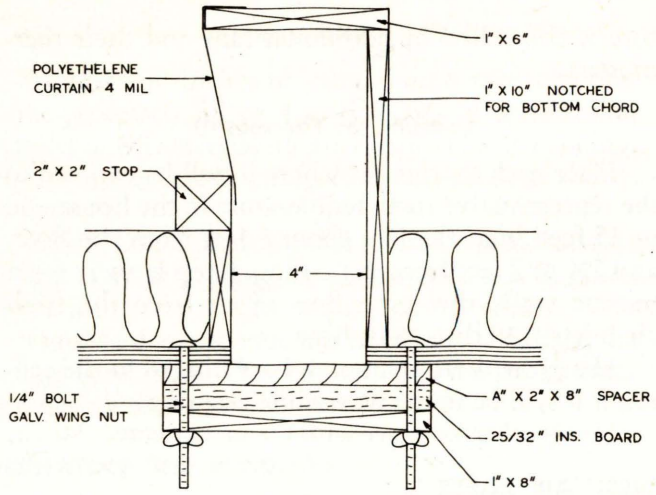


Figure 6. Alternate construction details of the slot inlet through ceiling with baffle, spacer and curtain.

Place a narrow spacer between the baffle board and the ceiling at each point where the baffle board is fastened. The thickness of the spacer will be determined by the desired opening required to balance the fan capacity in the house (table 2 and 3).

Note the anti-backdraft curtain in the slot inlet in figures 6 and 7. This keeps warm air and moisture from going into the attic if the system gets out of balance.

Table 2. The Number of Birds One Foot of Slot Inlet Will Serve When Baffle Board Is Spaced Various Distances from the Ceiling

No. of birds one running foot of baffle board will serve *	Distance Baffle is Spaced from Ceiling							
	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"
	3	6	9	12	15	18	21	24

*These figures are provided for a house with windows where 4 cubic feet of fan capacity rated at ⅛-inch static pressure is provided for each hen in the house and 24 square inches of slot opening is provided for each 100 cubic feet of total fan capacity. In a windowless house the fan capacity and slot opening figures should be increased by one-half during warm weather.

ATTIC INLETS

Attic inlets should provide ¾ square inch of attic inlet on each side or end of the attic for each bird in the house. Add to this for summer ventilation.

The attic inlet area can be slot openings below the eaves on long houses (figure 5) or louvered area in the gabled ends of the attic of short houses (figure 8).

Additional openings such as doors in each end of the attic (figure 8) and the narrow door or strip on hinges in the opening below the eave will increase the opening area for cross ventilation in summer (figure 5).

ADJUSTING THE SYSTEM FOR SUMMER VENTILATION

The following recommendations may be of help in adjusting the system for summer ventilation.

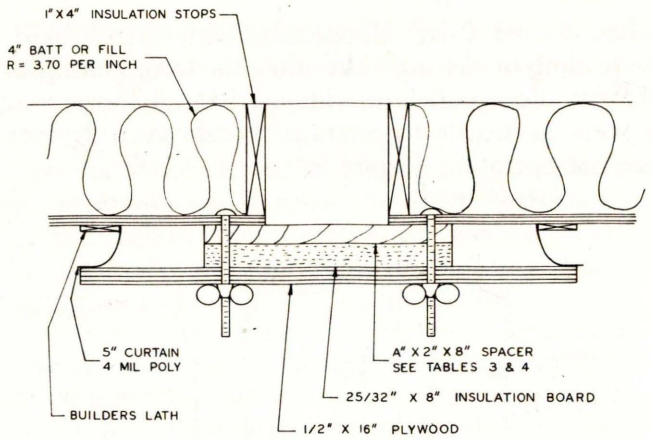
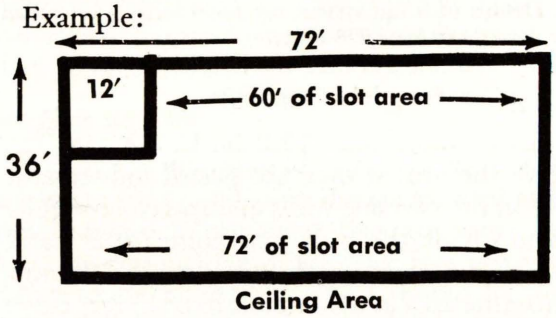


Figure 7. Alternate construction details of the slot inlet with baffle, spacer, and curtain.

Table 3. A 1-2-3 method of figuring the thickness of spacer between baffle board and ceiling.

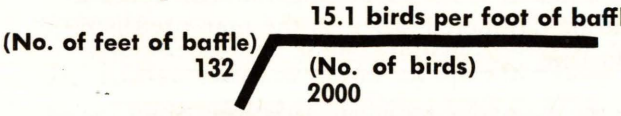
Step 1. Find number of feet available for baffled slot inlet.

Example:



Step 2. Divide number of birds in the house by the total number of feet of baffle board.

Example:



Step 3. Find baffle spacing on table 2 that will come closest to accommodating the number of birds per foot found in Step 2. Your spacer would be ⅝" thick.

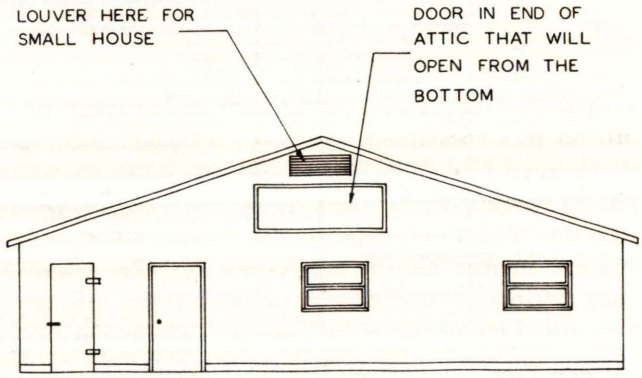


Figure 8. End louvers for admitting fresh air to the attic of short buildings with less than 1,500 birds.

Houses with Windows

Stop the fans and adjust the windows and doors for natural ventilation. Open a door in each end of the attic or increase slot area under the eaves to cool the attic area.

Close slot inlets in ceiling to prevent drawing heated air down from the loft by reversing anti-backdraft curtains or pulling baffle board tight against the ceiling.

Turn turn-about fans to provide cross ventilation during extremely hot weather.

Houses Without Windows

Open additional inlets into the attic such as doors in the ends and narrow hinged doors under the eaves to increase air movement through that area.

Here are three ceiling inlet adjustments:

Increase slot area through the ceiling by one-half and run the ventilating system same as during the winter months.

Close the slot inlets and blow air across the house by reversing the fans on one side.

Increase the baffle board spacing to 2 inches from the ceiling. Make sure that the curtain does not obstruct air flow and reverse all fans so air is forced up through the attic.

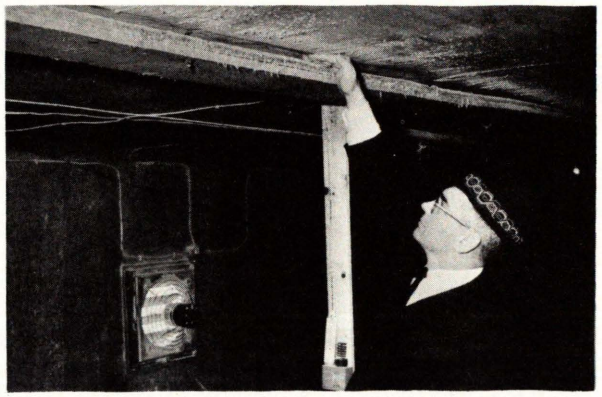


Figure 9. Fresh air is admitted to the house through a baffled slot inlet in the ceiling adjusted to balance the fan capacity.

EQUIPMENT AND ARRANGEMENT

Selecting the proper equipment for your situation and arranging it in the most efficient way is an important part of planning a new house. There are several different arrangements that will probably work equally well.

FEEDERS

Provide a minimum of 1 foot of mechanical feeder trough for 8 or 9 layers. Provide four to five round, hanging feeders or 20 feet of hand filled trough per 100 layers. Add a shell hopper and grit hopper for each 100 to 200 birds.

Flockowners with more than 1000 birds in one house should study the practical aspect of a mechanical feeder. Round hanging feeders or trough type feeders will do the job but it takes a lot of them.

Place most or all of the feeder space over the dropping pit area of the house.

FEED BINS

Provide storage space for 10 days or about 2½ pounds of feed per bird. One cubic foot of poultry feed weighs approximately 32 pounds.

It may be more practical to install a bulk bin outside the house and bring the feed in with an auger than to take insulated house space for feed storage. Plan storage for about a 10-day feed supply if delivery is dependable.

WATER SUPPLY

Provide at least 1 foot of water trough for each 15 or 16 birds or follow manufacturer's directions on fountains. Place water near feed.

Try to avoid having a build up of water and putrid smell below the water trough or fountain.

NESTS

Provide at least 1 square foot of roll-a-way nest per 7 or 8 birds in the house.

There are many types of nests and mechanical gathering equipment on the market so no attempt has been made to show any one type. Instead we have designed an egg gathering alley with reverse roll-a-way nests along the sides.

Weigh the cost of floor space for a gathering alley and equipment against the cost of possible labor saving features of a mechanical gathering unit before making a decision for or against mechanical equipment.

The hens may need nest pads, a layer of prairie hay or straw, or some other encouragement in the roll-a-way nests to get them started laying there; but the roll-a-way feature is almost a must if you are supplying a quality controlled market.

FLOORS

A concrete floor in a poultry house is optional. On deep litter, slat or wire floor the birds won't know the difference between gravel, dirt fill, or concrete.

Concrete may be practical if you need a moisture proof area for solid footing, a smooth surface for cleaning, or if there is no other way to keep rodents out. The convenience of a concrete floor in the work area and egg gathering alley is well worth the cost.

WORK AREA

Provide at least a 10 by 12 foot work area for a 1000 bird house; add more space as the flock size increases.

You will need a work area with a concrete floor and drain. This can be in the house or in another building just outside the house. Make the work area large enough so you aren't crowded. Hot water and toilet facilities are practical in the larger units.

EGG COOLER

Provide egg cooler space for about 1 week's supply or 1 case per 500 birds per day for 7 days.

An egg case covers 12 x 24 inches on the floor and is about 13 inches high. Cases can be stacked 4 layer high. Leave at least 6 inches around the stack of cases for air movement. Leave space to roll an egg cart into the cooler or space for baskets on shelves for cooling the eggs.

The egg cooler can be a self-contained cabinet or built in. Put the vapor barrier outside the insulation. Use 4 inches of insulation in the walls and 6 inches in the ceiling. A regular concrete floor or an insulated concrete floor will be sufficient.

LIGHTS

One 40 or 60 watt bulb for each 200 square feet of floor space is adequate. Distribute light over the eating and drinking area. Reflectors over the bulbs increase the light intensity at bird level. Place lights on two or more circuits so if one fails the birds will still have some light. Use a time clock to control the lighting period. Adjust it each week or 10 days to keep up with the change in length of daylight.

Use the standard 13- to 14-hour day of light unless you are on a special lighting program. This can be in morning lights, evening lights, or both.

Have the work area lights separate so they can be turned on without the rest of the lights going on.

Consider a stand-by electric plant for the larger units and windowless houses.

DROPPING PIT SPACE

Provide a minimum of ½-square foot of dropping pit area per bird in the house about 30 inches above the floor level for the pit and litter system.

Placing the feed and water on the pit area will concentrate the dropping load in the pit and relieve the litter area somewhat. This will help to keep the deep litter relatively dry and working.

DEEP LITTER SYSTEM

Deep litter offers many advantages. First, it saves labor because the house only needs to be cleaned once a year (between flocks). Second, it provides needed heat in the house to help ventilation. Deep litter in a house with the proper balance of insulation, ventilation, and bird numbers will stay relatively dry resulting in comfort for the birds and production of clean eggs.

Since deep litter depends on bacterial action rather than absorption, some definite things have to be done to make it work properly.

Start the litter in the early fall. Bacteria need warm temperatures to multiply.

Start with 6 to 8 inches of a relatively porous material such as cracked corn cobs, shavings, or chopped straw. Long straw is not good. If the litter is started late in cold weather, an inch of old rotted cow manure or clean black top soil from a field will inoculate the rest of the material with bacteria and help get the litter started.

The litter will probably go through a sweating or messy stage before the bacteria become built up to sufficient numbers to dry it. At this point, don't get discouraged and clean the house. Stir the litter when it starts to cake over on top. Adding a little more litter from time to time will help. It can be built up until it is 8 to 10 inches deep. Adding a little hydrated lime or superphosphate to wet litter will also help dry it.

It may be necessary to clean around feeders, water fountains, or other small areas in the house where birds concentrate. If this is necessary, clean out only the area that is wet. Then spread some of the old litter over the area and mix new litter with all the litter in the area. The old litter will inoculate the new with bacteria.

Once the litter gets started it should go on through the cold season with very little care. An occasional stirring with a fork and addition of litter should be sufficient.

Here is a checklist to study if deep litter is not working properly.

The house must be insulated to conserve heat. Double windows and doors are important. See the insulation section of this circular.

The ventilating system must be adequate. It must be able to exhaust at least 4 cubic feet of air per minute per bird at ⅛-inch static pressure at maximum capacity. Inlets must be distributed so fresh air comes into all areas of the house. See the ventilation section of this circular.

Birds should be allowed about 1¼ square feet of floor space in the house. Crowding puts more moisture load on the litter. Too few birds are also undesirable because not enough heat is produced to keep the house temperature up.

House temperature should stay above freezing—preferably 45 to 55 degrees. Poor insulation may restrict the use of ventilation because of heat loss through the walls and ceiling, raising the relative humidity above what it should be.

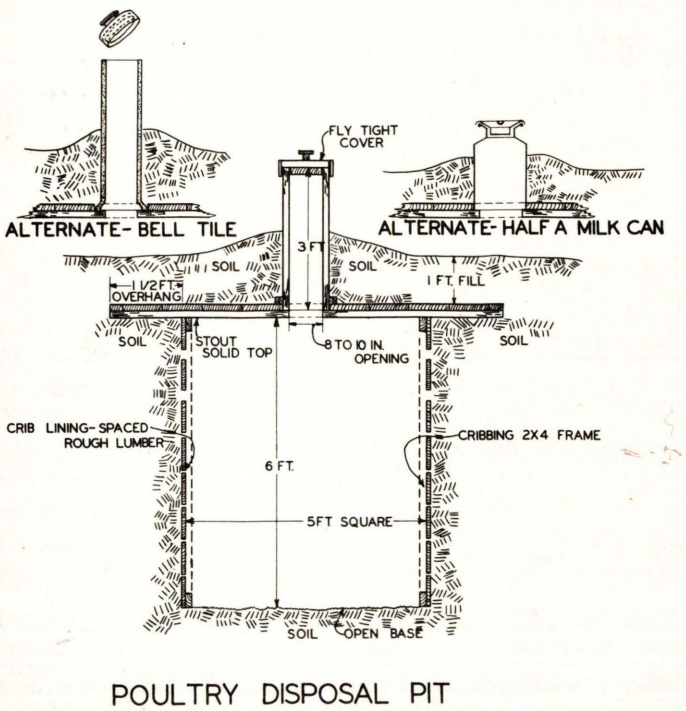
Poor drainage around the house or high water table may allow ground water to wet the litter from underneath.

Leaky water fountains or lack of provision for drainage around fountains on the floor may wet litter area.

Long straw, whole cobs, or other similar material will not make good deep litter because the particles do not lie close enough together.

Too little dropping pit space or lack of full use of dropping pit space will overload the floor litter. Put water and feed on the dropping pits to encourage birds to spend more time there.

Excessive salt, fiber or milk in the ration or minerals in the water will tend to make the droppings wet and put more load on the litter.



POULTRY DISPOSAL PIT

Figure 10. Details for building a sanitary disposal pit.

SANITARY DISPOSAL PIT

Dispose of dead birds immediately for a good disease control program (figure 10). Kill birds too sick to recover and dispose of them promptly and properly.

A sanitary disposal pit is a neat, practical way to do away with dead birds, small farm animals, and other such refuse quickly, completely, and easily. It saves time and labor.

A pit has no noticeable odors when tightly covered. It can be used the year around, even when the ground is frozen. Dead birds cannot be dug up by dogs or other animals.

Size. A pit 5 feet square and 6 feet deep should be large enough to accommodate dead birds from a flock of 2000 hens, 20,000 broilers, or 5,000 turkeys with normal mortality.

Depth. Pits should be at least 6 feet deep. The deeper the pit, the more rapid the decomposition. Dead birds decompose rapidly without the use of quick lime or other chemicals.

Location. Locate the pit conveniently close to the flock and where prevailing winds will carry odors away from the buildings. It should be at least 100 feet down from the water supply with the surface drainage away from the pit. Water in the pit will not prevent its use; but it will slow down bacterial action which will cause the pit to fill up more rapidly.

The Excavation. Dig the hole about 6 feet square and 7 feet deep with a shoulder 1 foot deep and 18 inches wide around the edge of the hole.

The Casing. Make a 5-feet square casing of rough lumber on a 2 x 4 frame. Scrap lumber or poles can be used as casing material. The type of soil will determine how tight the casing will have to be to keep the sides from caving in. Looser soils require tighter casings. Leave the bottom of the casing open.

The Top. Construct the top of two layers of pressure treated plank laid in opposite directions extending about 18 inches over the edge of the casing so the shoulder of soil supports it. Cut a hole in the center of the top section and install a wooden chute, bell tile, or old cream can with the bottom knocked out as an opening to the pit. Cover with about a foot of dirt. Slope the soil so the drainage is away from the opening. Install a tight lid over the opening to keep the odors in and flies out.

Coating the wood with a preservative such as pentachlorophenal or creosote will add to the life of the material and lengthen the life of the pit.

During a severe disease outbreak, when there might be a large number of dead birds at one time, it may be more practical to dig a separate hole and bury them rather than tax the pit. When one pit fills up, construct a second one and use the two alternately.

Some suggested floor plans for a basic 36-foot wide house, a work area, and egg cooler unit sizes, capacities, and construction are found in Extension Circular 624, "South Dakota Controlled Environment Poultry House."

Published and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914, by the Cooperative Extension Service of the South Dakota State College of Agriculture and Mechanic Arts, Brookings, John T. Stone, Director, U. S. Department of Agriculture cooperating.

5M—4-64—File: 6.2913—971