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EC1419 Revised 1937 A Standard Laying House Unit

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Extension Circular 1419 -37

Revised April, 1937

A Standard Laying House Unit



The 20 x 20 laying house may also be used for large broods of chicks.

The University of Nebraska Agricultural College Extension Service
and United States Department of Agriculture Cooperating
W. H. Brokaw, Director, Lincoln

A Standard Laying House Unit

F. E. MUSSEHL

LAYING HENS are especially responsive to environmental influences. Hens must be kept comfortable if we are to get maximum egg production, and so the *first essential* of poultry housing is to *provide the maximum of hen comfort*. The *second principle* is *convenience of the caretaker*, and the *third factor* always to be considered is *the overhead cost*.

There is a distinct advantage in having standard units which can be duplicated as often as necessary to provide the required capacity. Excellent results have been obtained with the standard shed-roof-type, 20x20 unit which is described in this bulletin. Each standard 20x20-foot unit will accommodate 125 Leghorn or 115 general-purpose-type hens.

Building Materials

Lumber and tile are the materials most often used for building poultry houses. Lumber has the advantage of being well adapted to construction by semi-skilled workers. The standard plan herein described is so simple that anyone that is at all skilled with hammer, saw, square, and level can do the construction work. Such work can be done during periods of slack work on the farm with a material saving in the expense.

Lumber has the virtue of providing good insulation per unit of volume. For the wall construction, drop siding, car siding, and shiplap are most commonly used. For framework, 2x4's are rigid enough to serve the purpose.

Hollow tile has the good qualities of being fireproof, and of having a low maintenance requirement. Another type of building material now being used experimentally consists of a mixture of earth with from three to five per cent of cement, this mixture being tamped into forms to make a wall 10 to 12 inches thick.

Floors and Foundations

Concrete foundations extending at least 18 inches below the ground level are recommended to prevent rats and other rodents from burrowing under the floor. Foundations which are six inches wide will be satisfactory.

Concrete floors have proved generally satisfactory for poultry houses, but recent experiments indicate that much less material needs to be used for floor construction than was formerly thought necessary. A one-to-six cement-gravel mixture laid just the thickness of a common 2x4 laid flat-wise will be heavy enough for all practical purposes. An experimental slab of cement floor just the thickness of a barn board has been in use for two years at the State experiment station at Lincoln with good results up to the present time. The advantage of having less material in the floor is that the cost is reduced, and, furthermore, the floor can be kept drier during the winter months because there is less material on which moisture will condense when air temperatures change suddenly. Much of the mois-

ture in the litter during the winter months is due to this condensation, and not to capillary action from underneath as was thought to be the case.

It has been found that a slope of five inches in 20 feet (the depth of the house) toward the front is very desirable in floor construction in order to keep the litter more evenly distributed near the front where the feeding and watering equipment will be located.

Roof Construction

Shed-type roofs are easy to build, and are practical for units with a depth no greater than 20 feet. A drop of at least three feet in 20 feet of depth is desirable for shed-type houses. Roof rafters should be placed 24 inches apart, and roof boards should be tight so that when windows and doors are open at certain seasons of the year, wind cannot blow



FIG. 1.—A 20 x 80 laying house that will house 500 hens.

through the roof from underneath, thus loosening the roofing paper at the points at which it is nailed. Some economy in roof construction can be effected by using one-ply roofing paper stripped with one inch metal strips every 18 inches. If the entire roof is then treated with asphalt emulsion and sprinkled with sand, the builder will have many of the qualities of a good, durable, built-up roof at relatively low cost.

Shingles can also be used, but for best results the roof slant should be at least 25 per cent when shingles are used.

Temperature Protection

Observations at the experiment station poultry farm at Lincoln indicate that a tight, single, board-wall poultry house, without additional insulation, will provide about 12 degrees of temperature differential on an average, quiet, winter day with zero outside temperatures. If this same house is lined with shiplap or car siding, and the four inch space between the studs and ceiling rafters is filled with shavings, crushed corncobs, or similar insulation material, an additional 20 degrees of temperature protection can be provided. With climatic conditions such as prevail over most of Nebraska, it is still a question whether the extra investment required by insulation is economical, but surely one can reason that insulation should be used before artificial heat is considered. The temperature protection provided by insulation is, of course, provided year after year with much less attention than would be necessary with any artificial heat-

ing system. It is estimated that the cost of insulating a standard 20x20 laying house unit need not exceed \$60.00 per unit, or about 50 cents per hen housed. If this additional cost is distributed over a ten-year period, the added temperature protection which the insulated house provides will cost about five cents per bird per year. Birds with inherently good laying ability will probably respond with enough extra eggs to pay for the extra overhead, but poor layers may not return enough more income to pay the extra cost of insulation.

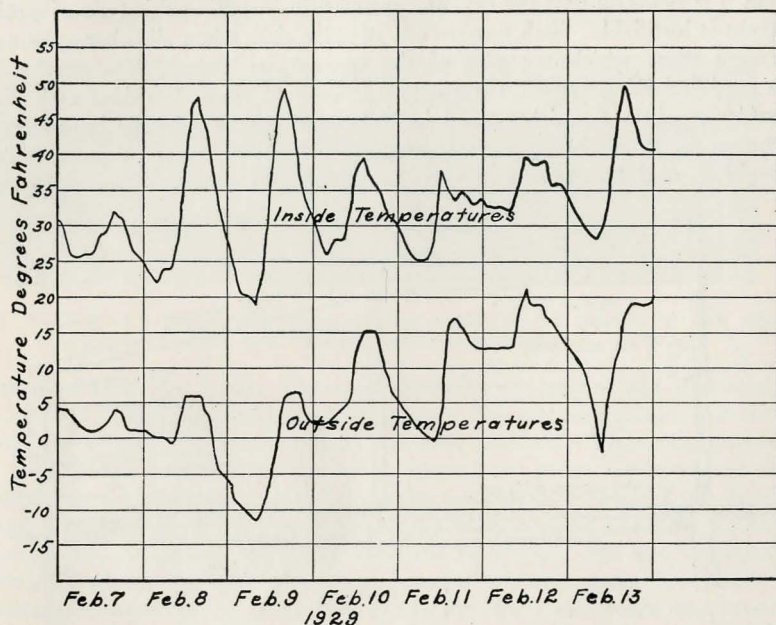


FIG. 2.—Chart showing protection provided by a well-built poultry house when the outside temperatures went to zero or below on three occasions.

The popularity of straw-loft poultry houses is due to the economical and effective insulation which straw provides. For this purpose straw should cover the ceiling to a depth of at least 12 inches. The front half of the standard shed-roof house can be adapted for straw-loft insulation, but, because of the lack of room, the back half of the ceiling would have to be insulated with shiplap, car siding, or similar material. Various types of insulation boards have been recommended for poultry houses, but the lack of durability of these materials suggests caution in their use.

Ventilation

As a management problem, poultry-house ventilation has provoked much speculation, but until recently little real investigation. Some recent

experiments at the Iowa and the Nebraska experiment stations show that during the winter months there is sufficient air leakage through walls and around doors and windows of even well-built poultry houses to maintain a proper degree of air quality. During cold weather heat conservation, rather than ventilation, is the important principle, for it has been quite clearly shown that at low temperatures hens are able to adapt themselves to conditions of low air movement with no ill effects.

King ventilation systems have been modified for use in poultry houses, but it is doubtful that the expense incurred in installing this type of equipment is justifiable. Such systems are effective only when all other openings, except those which are part of the system, are closed. The service of a modified King system, therefore, is limited to about 100 days each year under conditions which prevail in Nebraska. As has already been stated, during most of this period ventilation is a minor rather than a major problem, and heat conservation is the significant factor.

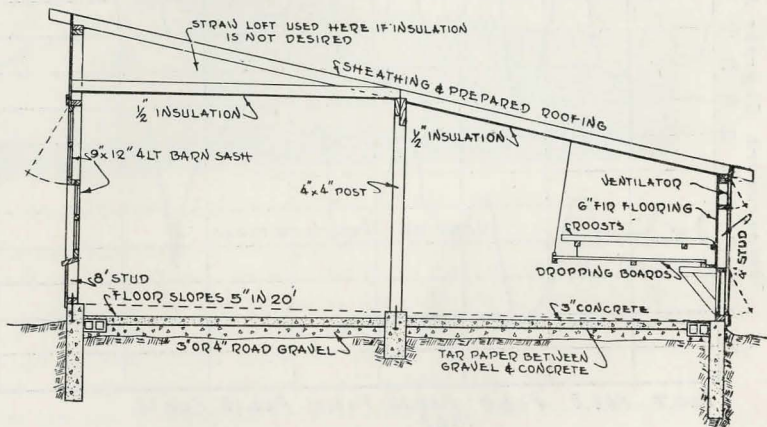


FIG. 3.—Cross section of a laying house. See Figure 5 for details of a roosting rack and dropping pit. See also discussion of floor materials.

The principles of poultry house ventilation are after all not unlike those of residence sleeping room ventilation. During the winter sleeping room windows are only partially opened, while during the spring and summer months more air is needed, and wider openings are provided. The ventilator in the back wall of the standard shed-roof-type house is especially useful during the summer months. It may be emphasized that summer ventilation is much more of a problem than is ventilation during the winter months. No system of poultry house ventilation now available is entirely automatic, and the common sense judgment of the caretaker must be relied upon to meet the situation from day to day. The adjustment of the standard barn sash in the front of the house according to weather conditions will meet the situation very satisfactorily.

Laying House Equipment

Essential laying-house furniture consists of roosts, dry-mash feeders, waterers, and nests.

Roosts.—The roosting rack, as illustrated in Figure 5, has been found very practical. With this system the droppings need to be cleaned out only as often as the litter is changed, since wire is used under the roosts and in front of them to keep the birds away from the droppings. Four roosts placed along the north wall of a 20x20 unit will provide 80 lineal feet of roosting space, which will be enough for 125 Leghorn hens or 115



FIG. 4.—Back of a large laying house, showing ventilation for summer use and also cellar sash, for both ventilation and light.

general-purpose-type birds. The roosting-rack arrangement has particular advantages during the summer months when free air movement about the birds on the roosts is very necessary for their comfort. When this system of roost installation is used, the roost nearest the front of the house is placed about 18 inches above the floor, the next about 21 inches, the third about 24 inches, and the fourth about 27 inches above the floor. This arrangement encourages the birds to fill the back roost first, and the front roost last, which is conducive to most peaceful relations in the hen family. One-by-two strips have proved very satisfactory for roosts when supported every four feet with 2x2's. Lawn fencing or poultry netting is nailed underneath the 2x2's. Roosts should be treated with wood preservative when installed, and once each year thereafter to control mites.

Nests.—Twenty nests for each unit of 125 hens will be sufficient even when the flock is laying at a rate of 70 per cent. Bottom dimensions of a practical nest are 14 inches deep and 12 inches wide. Nests should be placed on shelves, but not nailed, so that they can be removed easily for cleaning. Shelves and sides should also be treated with wood preservative to control mites.

When trapnests are used, one nest for every four hens is a satisfactory ratio. Trapnests are not, however, practical laying-house equipment, but must be considered one of the instruments used by professional poultry breeders.

Dry-mash feeder.—From the standpoint of its influence on egg production, the dry-mash feeder should probably be given first place in the lay-

ing house equipment list. Most poultry men build their management system around the practice of keeping dry mash constantly available. At least two six foot feeders should be provided for each unit of 125 hens. Small containers for oyster shell or crushed limestone and another container for road gravel for grit should also be provided.

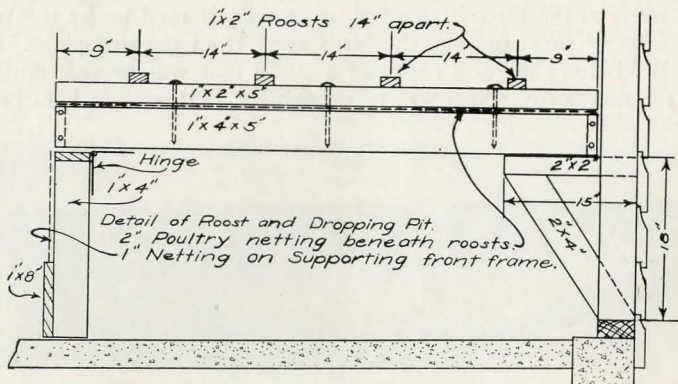


FIG. 5.—Details of a roosting rack and dropping pit.

Most of the mash feeders now being used are of the open-trough type with wire guides or reels on top to prevent birds from roosting on the feeders and contaminating the feed. Trough-type feeders have an advantage over the large-supply hopper type in that the consumption of grain and mash can be regulated more readily. The trough-type feeders are usually placed on a stand raised about 18 inches above the floor.

Watering equipment.—Equipment for watering ranges all the way from simple, twelve-quart pails to self-cleaning, running-water equipment, which may prove practical where running water is available at a low cost. When the weather is above freezing, a unit of 125 hens will require about six gallons of water daily. Setting the pail on a slatted stand above the floor so that litter will not be scratched into the water is advisable.

Other Adaptations of the Laying House Unit.

The standard 20x20-foot laying-house unit can also be used as a permanent brooder house for chicks and poults. Suggestions for adaptation to this use are given in Nebraska Extension Circular No. 1462.