Poultry House Equipment

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FOREWORD

One of the fundamental principles underlying a successful and profitable poultry enterprise is the provision for protection, comfort, and efficient management of the birds involved.

To assist those planning the construction of a new or the remodeling of an old poultry house, a series of three publications has been prepared. Station Circular 173, “O.S.C. Poultry Laying House” gives detailed plans for the construction of a conventional single-story poultry laying-house designed for flocks of 500 to 1,000 birds. Station Circular 174, “Two-Story Poultry House,” gives detailed plans for the construction of a two-story poultry house designed to accommodate 1,000 to 2,000 birds. The present circular is a companion publication for the above two. Within its pages will be found a discussion, plans, and illustrations of various pieces of equipment necessary for efficient management and care of laying birds.

As indicated by the authors, there is no one best house or piece of equipment for all conditions. There are, however, certain principles that should be fulfilled. The equipment illustrated in this circular has been used under commercial conditions and found satisfactory. As new designs are tested and found applicable under Oregon conditions, supplemental publications will be issued.

Wm. A. Schoofeld

Dean and Director
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Good poultry house equipment increases labor efficiency, reduces poultry mortality, and aids in obtaining maximum production of high quality eggs and poultry meat.

There perhaps is no one best piece of equipment to serve each functional need in a poultry house, but there are certain basic principles that must be met by each if it is to render maximum service and efficiency.

The equipment discussed and illustrated in this publication has been designed to meet the needs on most poultry farms. All equipment illustrated has proved satisfactory under commercial conditions.

**Mash and grain troughs**

Many types of feeding equipment are now in use. The open-trough style has quite generally replaced the older self-feeding type of hopper. Important points to be observed are the reduction of wastage, freedom from contamination by the birds' droppings, and the supply of an adequate amount of feeding space.

The troughs shown in Figures 1 and 2 are provided with lips on the upper inside edges. The purpose of these lips is to prevent the birds from pulling feed out on to the floor as they eat. If the amount of feed in each trough is held to about one half to one day's supply, these lips work quite effectively.

The revolving reel on top of the trough reduces feed wastage and helps to prevent birds from contaminating the feed with their droppings. These reels or rollers may be made in several styles. If the troughs are made more than 8 feet in length the reels sag and do not function properly. Wire grills with wires spaced 2 to 2½ inches apart are preferred by some poultrymen. The trough shown in Figure 2 is protected by a single wire held taut by a screen-door spring. This arrangement is simple and works effectively.

When grain is hand fed about 20 lineal feet of mash trough space is required for each 100 laying hens. (One 10-foot trough or two 5- or 6-foot troughs provide this amount of space if birds eat from both sides.) When the all-mash system is used or grain and mash are fed free-choice, the trough space should be about doubled (Figure 3).
Figure 1. O.S.C. mash and grain troughs.

Figure 2. Mash and grain trough.
MASH TROUGH

Figure 3. Drawing of mash trough.
The mash troughs shown provide 14 feet of feeding space. The hens eat from both sides of the 7-foot mash-containing section. The rest of the space is used for feeding grit, oyster shell, and perhaps granulated bone. When grain is hand-fed the following number of 7-foot mash troughs are suggested.

<table>
<thead>
<tr>
<th>Number of hens</th>
<th>Number of illustrated troughs suggested</th>
<th>Feeding space provided per 100 hens</th>
</tr>
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<tbody>
<tr>
<td>100</td>
<td>2</td>
<td>28 ft.</td>
</tr>
<tr>
<td>250</td>
<td>4</td>
<td>22 ft.</td>
</tr>
<tr>
<td>500</td>
<td>8</td>
<td>22 ft.</td>
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</table>

**Bill of Materials for One Eight-Foot Mash Trough**

1—2"x3"x6' S4S No. 1 Common
1—2"x8"x2' S4S No. 1 Common
3—1"x6"x8' S4S No. 1 Common
2—1"x4"x8' S4S No. 1 Common

2—1"x2"x8' Blind Stop
1—1"x2"x10' Blind Stop
16 lineal feet of Quarter Round
1 lb. 6d box nails
Nests

There are two general kinds of poultry nests, open nests and trap nests. Open nests are of varying sizes and descriptions and the hens are permitted to leave whenever they wish. A trap nest imprisons an individual hen until released by an attendant.

Open nests are recommended except where pedigree breeding is being practiced. These may be individual type or community type nests. About 20 of the individual type nests are required for each 100 hens. It does not pay to stint on the number of nests provided for any flock. Crowded nests invariably mean dirty and broken eggs. It may be found advisable to darken open nests with oilcloth or burlap curtains. The darkened nests reduce egg eating and cannibalism.

There are many types of open nests. One that has been used by many Oregon poultrymen is shown in Figures 5 and 6.

Figure 5. Drawing of open nests.

It is recommended that ¼-inch hardware cloth be used for the bottoms of these nests. Loose dirt and some of the nesting material will sift through the wire bottoms. The nests are so designed that even when double or triple tiered this material will sift clear through to the floor. It is possible, however, to use removable plywood bottoms held in place in each nest by small cleats tacked near the lower inside edge of the front and rear nest walls.

**Bill of Materials for 6 Open Nests**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1&quot;x2&quot;x12&quot; S4S No. 1 Common</td>
</tr>
<tr>
<td>1</td>
<td>1½&quot;x 6&quot;x12&quot; S4S No. 1 Common</td>
</tr>
<tr>
<td>1</td>
<td>1½&quot;x 4&quot;x12&quot; S4S No. 1 Common</td>
</tr>
<tr>
<td>1</td>
<td>1½&quot;x 2&quot;x12&quot; S4S No. 1 Common</td>
</tr>
<tr>
<td>1</td>
<td>1½&quot;x4½&quot; Wire Mesh Bottom</td>
</tr>
<tr>
<td></td>
<td>1½&quot; Wire Mesh Bottom Front</td>
</tr>
<tr>
<td></td>
<td>1½&quot; Wire Mesh Bottom Side</td>
</tr>
<tr>
<td></td>
<td>6 sq. ft. ¾&quot; mesh hardware cloth</td>
</tr>
<tr>
<td></td>
<td>½ lb. 6d box nails</td>
</tr>
<tr>
<td></td>
<td>½ lb. ¼&quot; poultry netting staples</td>
</tr>
</tbody>
</table>

These nests may be built in batteries of any length and should be so assembled that they can be easily removed for cleaning and spraying whenever desirable. Batteries of six have been found con-
venient. The bill of materials for a battery of six open nests listed at the bottom of page 9 may be helpful. Where nests are tiered, the 1 x 6 inch top boards are not needed for the lower tiers.

Figure 6. Open nests (individual type).
Community type nests are preferred by some poultrymen. This type of nest is usually between 2 and 2 1/2 feet in width and extends in length to fit the nest location. Frequently there are no partitions and the front is open to permit entrance by birds at any point. Community-type nests as shown in Figures 7 and 8 have one or two openings for the entrance and exit of birds. The top of these nests is usually sloped and hinged. This keeps the birds from perching on the nests and makes it more convenient to gather eggs. A 2 1/2 x 5 foot or 2 x 6 foot community nest will care for 50 to 60 hens.

Figure 7. Community-type nests.
To provide adequate ventilation in community nests it is important that the upper portion of the back be left open. For the same reason the nests should not be set any closer than 3 or 4 inches to a flat surfaced wall. Two methods are shown for setting these nests up in a pen. It is also possible to use hangers in suspending the nests from walls.

Figure 8. Community-type nest with top opened for gathering eggs.
Watering devices

From 3 to 5 gallons of water are required daily for each 100 hens. More water is required during hot weather and during periods of high egg production. The ideal solution is to have running water

Figure 9. Trough-type watering fountains.
Figure 10. Drawing of circular-type watering fountain.
piped to the poultry house. The watering devices or systems illustrated are based on the assumption that running water will be available.

Figure 11. Circular-type watering fountain.

Figure 12. Trough-type watering fountain on an outside wall of the pen.
There are many other satisfactory fountains available. Some of these fountains are the originals of those illustrated, some are modifications, and others are distinctly different. All have been designed with an effort to reduce water wastage, to save labor in cleaning, and to reduce spillage of water in the litter surrounding the fountains. The main requisite of any satisfactory fountain, however, is to furnish an adequate supply of fresh water to the birds at all times. All other factors though important are secondary.

**Liquid milk feeder**

The liquid milk feeder shown in Figure 13 has proved to be a very satisfactory type of feeder. If no more milk is fed at one time than what the birds will clean up in about 30 minutes, any type of pan or trough is satisfactory. Graniteware or enamel pans will not corrode or rust during the normal period of usage. The pan fits into and is held in place by a \( \frac{3}{8} \)-inch iron ring. This ring is welded to a short piece of iron (1-inch by \( \frac{1}{4} \)-inch) by which it may be fastened to the poultry-house wall. The diameter of the pan will determine the diameter of the iron ring. The holder should keep the top of the pan about 12 inches from the top of the floor litter.

*Figure 13. Liquid-milk feeder.*
Green-feed hopper

Many poultrymen feed chopped green feed to laying hens. If this green feed is thrown on the floor, as is too frequently done, a good portion of it will be wasted by the birds and because of the high water content it becomes just another added source of moisture.

Figure 14. Green-feed hopper.

Figure 15. Construction details of green-feed hopper.

Bill of Materials for One Green-Feed Hopper

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>1&quot;x12&quot;x12&quot; No. 1 Common</td>
<td>1</td>
</tr>
<tr>
<td>1&quot;x4&quot;x10&quot; No. 1 Common</td>
<td>1</td>
</tr>
<tr>
<td>1&quot;x4&quot;x14&quot; No. 1 Common</td>
<td>1</td>
</tr>
<tr>
<td>3 feet of 30&quot;-1&quot; mesh poultry netting</td>
<td>1</td>
</tr>
<tr>
<td>⅛ lb. 1&quot; poultry netting staples</td>
<td>1</td>
</tr>
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in the litter. A good, inexpensive, homemade green-feed hopper is illustrated in Figure 14. If dropping boards are used, this hopper may be constructed so that it will slide under them. This can be accomplished by nailing properly spaced grooved boards under the dropping boards and adding cleats to the upper outside edges of the hoppers, which can then be slipped in and out like drawers. If used elsewhere a board top should be provided to keep the birds out of the green feed.

Litter carrier

A litter carrier is an economical addition to any laying house of 250-hen capacity or more. The track should be placed so that the carrier will run parallel to and just in front of the dropping boards or pit. This will reduce the labor in house cleaning.

A practical homemade carrier and a simple method of track installation are illustrated in Figures 16, 17, and 18. Such a carrier may be installed in almost any type of poultry house.

Figure 16. Scraping screened droppings to litter carrier.
Figure 17. Construction details of a practical home-made litter carrier and a simple method of supporting the carrier track.
The 2" x 6" which supports the track is bolted to the ceiling through the cross ties. If not installed while the house is being built, it may be necessary to use lag screws instead of bolts as in some houses it is not convenient to work from above after the ceiling has been put in place. The 2" x 6" and track should extend through a door at the end of the house for a distance of 16 to 20 feet from the building, thus enabling the dumping of the carrier directly into a manure spreader, covered manure pit, or on to the ground. Figure 18 illustrates a good support for this outside track.

The carrier box has 2" x 2" ribs with sides and ends made of 1" boards. The box is fastened to the frame by two ½" x 5" bolts placed 6" from the bottom. A pin placed near the top at one end keeps the box in an upright position. The removal of this pin permits the box to swing on the two bolts, thus dumping its contents.

In a house with internal partitions and dropping boards, the carrier which is correctly hung with respect to the edge of the dropping boards will not quite clear the partition door jamb unless it is pulled an inch or two away from the dropping boards. Slightly tapered pieces of 2" x 4" can be nailed to the under edge of the dropping boards, on each side of the partitions, so as to push the carrier out far enough to effect clearance automatically. Without this provision the carrier box will soon become damaged by frequent collisions with the door jambs.
Feed Bins

Feed bins should be a part of normal poultry house equipment. They are easily constructed and greatly facilitate feeding operations. If properly constructed this equipment will soon be paid for out of feed savings alone. Two general types of feed bins are illustrated in Figures 19 and 20.

Figure 19. Construction details of a small feed bin.
Figure 20. Construction details of a large mash bin.
Broody Coops

The duration of broody periods of hens can be shortened if such hens are placed in broody coops or cages. This practice is also desirable if for no other reason than to keep broody birds out of nests. Broody coops should be open on all sides and the bottom, thus providing good ventilation; hence, they are usually constructed largely of wire. To reduce labor in caring for birds confined to broody coops, it is well to locate them over the dropping boards or pits. Some people, however, prefer to keep all broody birds in wire coops or fattening batteries located in the feed room or other convenient building where they can be cared for as a group rather than as individuals. A broody coop suspended over dropping boards is shown in Figure 21.

![Figure 21. Broody coop.](image)

Sun Porches

Sun porches offer fowls protection from contaminated soil, thus enabling poultrymen to keep a larger number of birds on a much smaller area of land than otherwise would be possible. Wire porches are one of the better of the many types in use. Vegetation should not be permitted to grow high enough under sun porches for birds to reach it. Such growth interferes with the passage of droppings
through the wire, as well as offering birds indirect access to soil that may have been contaminated by previous birds. Applications of oil or commercial weed poison to the ground under the porch are good methods of preventing growth of grass and weeds.

For adult birds a porch six feet wide and running the length of the laying house will be sufficient. The wire should be 1-inch mesh and no lighter than 18 gauge. It is advisable to cover the sun porch with light fencing to keep the birds from flying out or moving from one pen to another.

Other types of yards such as slatted porches, gravel yards, and concrete runs have been used by various poultrymen in Oregon over a long period of time with good success.

Figure 22. A wire porch in front of an O.S.C. commercial laying house.

**Screened Dropping Boards**

Many poultrymen feel that it is desirable in the interests of sanitation and cleaner eggs that fowls be kept from droppings that accumulate on the dropping boards or in pits. Figures 23 and 24 illustrate one method of accomplishing this effectively.
Figure 23. Bolts used to tighten dropping-board screen wires.

Figure 24. The dropping-board screen bolts pull against a plank in the feed room.
Wires are strung the entire length of the boards on a level with
the bottoms of the perch supports. Holes permit these wires to
pass through all partitions. Bolts, pulling against a 2" x 12" or bus-
bar at the feed room end of the dropping boards, make possible the
tightening of the wires. The other ends of the wires are secured by
being twisted together in pairs after passing through holes in a simi-
lar bar on the outside of the building. This bar is visible in Figure
18. It is essential that these end supports be firmly secured as shown
since quite a force is operative when the bolts are tightened. Added
rigidity is given the wires by stapling them to the bottoms of the
perch supports. The wires are placed two inches apart. Galvanized
wire of No. 12 gauge is recommended.

Removable 8-inch boards prevent the hens from going under the
wires at the front of the dropping boards. Figure 16 shows one of
these boards removed and one in place.

This method of screening dropping boards is superior to the use
of wire netting. From present indications the smooth wire will last
the lifetime of the poultry house while netting requires patching and
replacement every two to four years. The smooth wires are easily
cleaned and do not mat with droppings as frequently happens with
netting.

The use of welded wire as a method of screening dropping pits
is shown in Figure 25.
Dropping pits

Many poultriesmen prefer dropping pits to dropping boards. In general they increase labor efficiency. The floor area to which the birds have access is reduced, but this may be partially if not completely compensated for by the fact that the birds spend much more time on the lower perches. A point frequently advanced in favor of dropping pits is that there is less danger of foot and internal injuries when lower perches are used than where the birds are required to fly down to the floor from the higher level of dropping boards.

Detailed construction plans for both dropping boards and dropping pits are given in Station Circular 173, O.S.C. Laying-House.

Poultry disposal pit

A problem common to all poultriesmen is that of disposing of dead birds and other refuse associated with the production of commercial eggs and poultry meat. One of the most effective ways of maintaining and spreading disease on a poultry farm is to allow healthy chickens, flies, and rats access to carcasses of birds that have died. It is, therefore, important in the management of all poultry farms to make provisions for the proper disposal of dead birds. One of two systems may be selected: the use of an incinerator or burial.

Incinerators provide a very effective and acceptable method of disposing of dead birds. Because of the inconvenience and expense of starting a fire each time a bird dies, most poultriesmen find it to their advantage to let carcasses accumulate. This accumulation even for a short time is obnoxious and may become a dangerous source of infection. Burial or use of a disposal pit frequently is more satisfactory.

In the use of a disposal pit similar to the plan shown, it is important to keep the opening covered. To further guard against flies the inside of the entrance tube and as much of the pit as possible should be periodically treated with DDT or other effective fly-killing agent.

A more complete description of construction, selection of location, and usage of a poultry disposal pit will be found in O.S.C. Circular of Information No. 444, A Disposal Pit for Dead Chickens and Turkeys.

Electric wiring

Vapor-proof fixtures and conduit are required where the walls and ceilings are to be hosed down. Non-metallic sheathed cable may be used if care is taken when the house is cleaned and washed.
For complete information on regulations for poultry house electric wiring, confer with a licensed electrician or the State Electric Inspector, Bureau of Labor, Salem.

In order to obtain maximum production through the fall and winter months it is necessary to supplement the normal daylight...
hours with artificial light to the extent of providing the birds with a 13- to 14-hour working day. Lights are normally used for a few hours in the morning or evening or at both times to provide the required lighted hours. For convenience and to assure regularity, a master control switch should be provided in the feed room or some other convenient location for all lights in a poultry house. If evening lights are to be used a dimming system should also be installed as a method of warning the hens to go to the roost before the lights are turned off completely. In general, dimming is accomplished by placing special resistance in the lighting circuit.

Lights in a poultry house should be located and spaced in a manner that will provide good illumination over the roosting space and feeders. Sixty-watt lamps with broad reflectors will usually suffice. The outlets are normally spaced 10 to 15 feet apart.

Egg room

On all poultry farms it is necessary to provide space for the care and handling of eggs. During the summer months heat and low humidity make it particularly difficult to market high quality eggs. The construction of an insulated and humidified egg storage room (see cover illustration) materially lessens this problem. The value of an egg room and detailed plans for its construction are well illustrated in Station Circular 138, "Factors Affecting Egg Quality." Provisions have also been made for the construction of an egg room in both the single- and two-story poultry houses as presented in Station Circulars 173 and 174.

Note: Blueprints of any of the equipment illustrated in this circular may be secured through the Extension Agricultural Engineer, AE 101, Oregon State College, Corvallis, Oregon. There is a charge of 25¢ for each print and an additional service charge of 35¢ for each order.