IF A POULTRY HOUSE IS:

DRY
DURABLE
WELL LIGHTED
EASILY CLEANED
REASONABLY INEXPENSIVE
UNIFORM IN TEMPERATURE

IT WILL MAKE A COMFORTABLE HOME FOR HENS.

MICHIGAN SHELF

F. E. FOGLE,
Asst. Prof. in Ag. Engineering

Profitable poultry husbandry is pursued in an intelligent manner. The management must consider how well fed, will not the hens be? Fed well, will not the hens grow? How will the litter be managed? What will be the ventilation? The Michigan Shed is simple. Fig. 1.—The Michigan Shed, simple.

EXPENSIVE HOUSE

It is not necessary that the house be a large and costly structure in order to secure the desired results. The cost of the house will vary with the care with which it is built. The care in planning to build or remodel the house will make it most suitable for the purpose.

DRYNESS

The first essentials are dryness and ventilation. A large amount of the moisture is exhaled through the respiratory tract. This means ventilation with moisture. If this moisture is not removed, the litter becomes damp, the atmosphere becomes damp, and the house becomes unhealthy.
Profitable poultry husbandry can become a fact only where the business is pursued in an intelligent way. Birds of good breeding, no matter how well fed, will not return maximum profits unless well housed.

EXPENSIVE HOUSES ARE NOT NECESSARY

It is not necessary that elaborate and expensive houses be constructed in order to secure the best results. The fact that excessive over-head will of necessity limit profits, must be borne in mind. In planning to build or remodel a poultry house, the conditions which will make it most suitable must be considered.

DRYNESS IS ESSENTIAL

The first essentials are dryness and adequate ventilation. Hens void a large amount of the moisture from the system through the respiratory tract. This means that the air is continually being charged with moisture. If this moisture laden air is not continuously removed, the litter becomes damp, the ceilings are covered by drops of condensing water, and the house has a damp, stuffy odor.
DIRECT SUNSHINE IS A FACTOR IN HEALTH

Light is the second essential. Birds will not remain healthy in dark, dingy houses. Not only is light essential, but direct sunlight is far superior to sunshine filtered through glass. The ultra-violet ray, one of the short rays of the sun, has decided medicinal factors. It prevents rickets, aids in calcium retention, and consequently improves the quality of the egg and its hatching power. This ray does not pass through glass, and in order to be sure that the birds are exposed, direct sunshine is necessary. The windows should be arranged accordingly and hinged to permit opening on fine days.

A DRY

The first consideration is ventilation. Soil drainage is highly desirable. The most suitable sand or gravel should be avoided. Low land, free from surplus water, must be avoided. Air pockets or locations are to be avoided. Low land, free from surplus water, should be at sufficient distance from the house to facilitate air circulation and prevent the birds from coming into contact with damp or cold air.

BUILD TO AVOID

While a hen will thrive on a diet of corn and other grains, it will not fail to produce eggs of high quality. The writer does not recommend the use of corn as the only food. While a hen may live on corn, and will produce eggs of fair quality, it will not be as healthy as a hen that is fed a balanced diet. A dry, well-drained site is highly desirable. The house should be well-ventilated, and the drainage should be adequate to prevent the accumulation of water around the house.

Fig. 2.—Floor plan—note the arrangement of openings, nests, perches, ventilators, and dry mash feeders.

Fig. 3.—South Elevation—Air pockets or locations should be avoided. Low land, free from surplus water, should be at sufficient distance from the house to facilitate air circulation and prevent the birds from coming into contact with damp or cold air.

BUILD TO AVOID

While a hen will thrive on a diet of corn and other grains, it will not fail to produce eggs of high quality. The writer does not recommend the use of corn as the only food. While a hen may live on corn, and will produce eggs of fair quality, it will not be as healthy as a hen that is fed a balanced diet. A dry, well-drained site is highly desirable. The house should be well-ventilated, and the drainage should be adequate to prevent the accumulation of water around the house.
A DRY SITE IS ESSENTIAL

The first consideration in building a new poultry house is the location. Soil drainage is highly important to maintain dry, sanitary conditions. The most suitable location is a southern exposure, on a light sandy loam or gravelly loam soil. Heavy clay soils are difficult to drain and soon become contaminated. Very light sand is not highly desirable. While sanitation is easily maintained on a soil of the above mentioned type, it is extremely difficult to maintain on it any growing crops for forage.

BUILD TO AVOID EXTREME TEMPERATURES

While a hen will thrive in relatively low temperatures, extremes should be avoided. In cold locations, more attention must be given
to the insulation of the houses. Narrow houses of ten or twelve feet width, expose the birds to lower temperatures than do houses eighteen or twenty feet wide, where the birds roost at a considerable distance from the front of the buildings. An excess of glass area causes the temperature of the houses to drop quickly at night. Allow one square foot of glass to every ten or twelve feet of floor space. Houses which are too high are much colder than lower buildings. The houses should not be any higher than will give sufficient head room for the attendant.

Use concrete for foundation and floors

The trench for the foundation wall should be about two feet six inches deep and ten inches wide. It should be filled one foot six inches with cobble stone. Gravel or cinders may be used, provided the fill is soaked with water and thoroughly tamped. Forms should then be erected for a fall eight to 12 inches above the ground level, and six inches thick. The concrete mixture should be one part cement to two and one-half parts sand and five parts gravel. A mix clean, sharp, bank-run gravel should contain as much mix screen as will go through eight inches to 12 inches a age. Gravel or cinders may be used. The gravel or cinder fill should be thoroughly settled by soil or cinders may be used. Clay or cinder fill settled well act as an insulator and floor. This roofing should be sealed with roofing cement. The three inch concrete as for the foundation. To be placed in each side. By mixing the surface of the floor cleaned more readily.

PREPARED ROOFING

Shingles cannot be reco flooring, covered with three and easily put on. Slate has wearing qualities, but plain of roofing paint every two
five parts gravel. A mixture of one part cement and six parts of clean, sharp, bank-run gravel may be used. Good bank-run gravel should contain as much material which will stay on a one-quarter inch screen as will go through it. Concrete floors should always be built eight inches to 12 inches above the ground level, to insure good drainage. Gravel or cinders make the most satisfactory fill.

The gravel or cinder fill should next be placed. This fill should be thoroughly settled by soaking with water and tamping. After the fill is leveled, it should be covered with a layer of two-ply roofing paper to act as an insulator and to prevent moisture coming through the floor. This roofing should be carefully laid, and the joints should be sealed with roofing cement.

The three inch concrete floor is then laid, using the same mixture as for the foundation. Two anchor bolts eight inches long should be placed in each side. By means of these bolts the sills are made secure. The surface of the floor should be troweled smooth, so that it may be cleaned more readily.

**PREPARED ROOFING IS ECONOMICAL AND SATISFACTORY**

Shingles cannot be recommended on a flat roof. Shiplap or six inch flooring, covered with three-ply roofing, is very satisfactory, economical, and easily put on. Slate covered roofing is better in appearance and wearing qualities, but plain surfaced is satisfactory if given a coating of roofing paint every two or three years.
Fig. 6.—Interior perspective. The equipment is arranged to give as much clear floor space as possible. The roosts are suspended in front of the ceiling, and the dropping boards are braced to the foundation, giving more clear floor space.
Fig. 7.—Framing perspective as used for vertical siding. When horizontal siding is used, the studding should be placed two feet apart, without girts. The purlin plate prevents sagging of the roof.
THE VENTILATING SYSTEM PROVIDES FRESH AIR AND REMOVES MOISTURE

The ventilating system consists of four intake flues and one large outlet flue. The two intake flues on the front of the house are in the studding space between the windows. The rear intake flues are built outside the wall, connected with flues between the rafters, and they discharge air near the purlin plate. A portion of the plate should be cut away to make the flue full size at this point.

The inlet flues admit air to the house near the roof and take it from the outside near the ground. This arrangement prevents a direct draft into the house, and to a certain extent keeps the intakes from acting as outtakes. The intake flues should be closed, or partly closed, in case of extremely cold weather. During a strong wind they should be closed on the side of the house against which the wind is blowing. The outlet flue draws air from near the floor, thus holding the warmer air in the upper part of the house. The damper in the outlet flue should be closed only in sub-zero weather.

For summer ventilation, both doors and the front and rear windows should be opened. The four inch space back of the dropping boards permits a circulation over the perches.

As an extra means of ventilation during warm weather, an opening is made into the outlet flue near the roof. This opening is kept closed in cold weather.
THE OUTTAKE VENTILATOR

The outtake flue should be fitted with a metal ventilator to make it weatherproof and to give the building better appearance. The ventilator should be as large as the flue; so that the flue capacity is not limited by the roof ventilator. Because of low cost and simplicity the stationary type ventilator is well adapted for the purpose. This is especially true when it is desirable to keep the cost to the minimum.
Fig. 11. — A simple method of testing watering pans.

less than 12 inches from dropping board, but they amount of light in the rear.
WATER PANS AND FEEDERS SHOULD BE PROTECTED FROM FILTH

Fig. 11 shows a simple method of protecting drinking dishes from contamination. The drinking dish may also be protected by a revolving cover of the type used on the dry mash feeder. The watering pan is an excellent medium for the distribution of infectious disease. It should be cleaned frequently, and filled with fresh, clean water daily.

NESTS

Clean eggs can be produced only in clean nests. The straw must be frequently changed, and during warm weather a close watch must be kept for mites. Figure 10 illustrates a simple battery of wall nests. These should be set so that the lower nests are not less than 12 inches from the floor. Nests may be placed under the dropping board, but they are more difficult to clean and reduce the amount of light in the rear of the house.
CARE AND MANAGEMENT OF THE POULTRY HOUSE

Dropping boards aid in sanitation if cleaned regularly

The purpose of dropping boards is to prevent the soiling and contamination of litter. Where the boards are protected by wire, as shown in figure 12, the birds cannot scratch in the droppings, thus spreading disease and soiling eggs. It is good practice to clean the boards every morning as part of the daily routine, but where this is not possible they should not be left more than two or three days, particularly in warm weather.

The accompanying figure, No. 13, shows a type of feeder which is particularly adapted to general poultry keeping conditions.

Litter provides exercise

The floor should be kept covered with about six inches of dry litter. Wheat or rye straw is most suitable for this purpose. This should be replaced as soon as it becomes damp or badly broken up and soiled. When houses are filled to capacity, litter should not be left in more than a month.
BILL OF MATERIAL FOR MICHIGAN SHED TYPE POULTRY HOUSE, 18' x 20'

<table>
<thead>
<tr>
<th>Use</th>
<th>No.</th>
<th>Size</th>
<th>Quantity</th>
<th>Description</th>
<th>Price</th>
<th>Amt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation and Floor</td>
<td>8</td>
<td>5' x 5' x 12'</td>
<td>224 bds.</td>
<td>No. 2 Y. Pine</td>
<td>50.00</td>
<td>11.20</td>
</tr>
<tr>
<td>Anchor bolts</td>
<td>8</td>
<td>10 pr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame</td>
<td>8</td>
<td>2' x 4' x 8'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rafters</td>
<td>24</td>
<td>2' x 4' x 10'</td>
<td>160 bds.</td>
<td>No. 2 Y. Pine</td>
<td>50.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Ridge, Purlin, Post</td>
<td>6</td>
<td>2' x 6' x 12'</td>
<td>60 bds.</td>
<td>No. 2 Y. Pine</td>
<td>50.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Dropping Boards</td>
<td>10</td>
<td>2' x 4' x 10'</td>
<td>67 bds.</td>
<td>No. 2 Y. Pine</td>
<td>50.00</td>
<td>3.35</td>
</tr>
<tr>
<td>Porches</td>
<td>8</td>
<td>2' x 2' x 10'</td>
<td>27 bds.</td>
<td>No. 2 Y. Pipe</td>
<td>50.00</td>
<td>1.65</td>
</tr>
<tr>
<td>Roof Boards</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side, doors</td>
<td>4</td>
<td>2' x 4' x 10'</td>
<td>600 bds.</td>
<td>No. 2 ship lap</td>
<td>50.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Vent. Fuses</td>
<td>4</td>
<td>2' x 4' x 10'</td>
<td>600 bds.</td>
<td>No. 1 flooring</td>
<td>50.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Ceiling</td>
<td>4</td>
<td>2' x 4' x 10'</td>
<td>520 bds.</td>
<td>No. 2 flooring</td>
<td>50.00</td>
<td>26.00</td>
</tr>
<tr>
<td>Dropping Boards</td>
<td>4</td>
<td>2' x 4' x 10'</td>
<td>125 bds.</td>
<td>No. 2 flooring</td>
<td>50.00</td>
<td>6.25</td>
</tr>
<tr>
<td>Roofing</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corricle</td>
<td>1</td>
<td>1' x 4'</td>
<td>300 lin. ft.</td>
<td></td>
<td>3.00</td>
<td>18.00</td>
</tr>
<tr>
<td>Cornice</td>
<td>1</td>
<td>1' x 6'</td>
<td>40 lin. ft.</td>
<td></td>
<td>6.00</td>
<td>1.20</td>
</tr>
<tr>
<td>Sash</td>
<td>6</td>
<td>3' x 10 x 12</td>
<td></td>
<td>Barn sash</td>
<td>1.65</td>
<td>9.90</td>
</tr>
<tr>
<td>Door Hinges</td>
<td>2</td>
<td>5'</td>
<td></td>
<td>Cellar sash</td>
<td>1.25</td>
<td>3.75</td>
</tr>
<tr>
<td>Window Hinges</td>
<td>6</td>
<td>3'</td>
<td></td>
<td>T Hinge</td>
<td>.20</td>
<td>1.20</td>
</tr>
<tr>
<td>Ventilator Hinges</td>
<td>5</td>
<td>3'</td>
<td></td>
<td>T Hinge</td>
<td>.12</td>
<td>0.72</td>
</tr>
<tr>
<td>Door Locks</td>
<td>2</td>
<td></td>
<td></td>
<td>Rim Lock</td>
<td>.50</td>
<td>1.00</td>
</tr>
<tr>
<td>Roof Ventilator</td>
<td>1</td>
<td>18 x 18</td>
<td></td>
<td></td>
<td>.70</td>
<td>1.50</td>
</tr>
<tr>
<td>Nails</td>
<td>1</td>
<td>10 lbs.</td>
<td></td>
<td></td>
<td>.05</td>
<td>0.50</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$14.00</td>
<td>$240.20</td>
</tr>
</tbody>
</table>

NOTE: Prices must necessarily be approximate and should serve only as a basis for calculating costs, when local prices for materials and labor are known.

MAKE AN ANNUAL CLEAN-UP

In addition to the maintenance of sanitary conditions throughout the year, an annual clean-up is advisable. This should come in the fall before the new pullets are put into winter quarters. All litter and removable equipment should be carried out; the walls and ceiling swept down; the floor and dropping boards scrubbed to remove all dirt and filth. The equipment should receive a similar treatment. When this has been done, the plant is ready to disinfect. It is useless to spray disinfectant over areas covered with filth and manure.

Any of the coal tar disinfectants are suitable as a poultry house disinfectant. These should be used according to directions, and will give better results if applied warm or hot.
DO NOT OVERCROWD BIRDS

They require:

- Three and one-half to five square feet floor space per bird.
- Seven to ten inches of roost space per bird.
- One nest to each five or six birds.
- One nest to each four hens if traps are used.
- Ten feet of hopper space per 100 birds.
- Adequate drinking fountains.
- Grit and shell always available in hoppers.