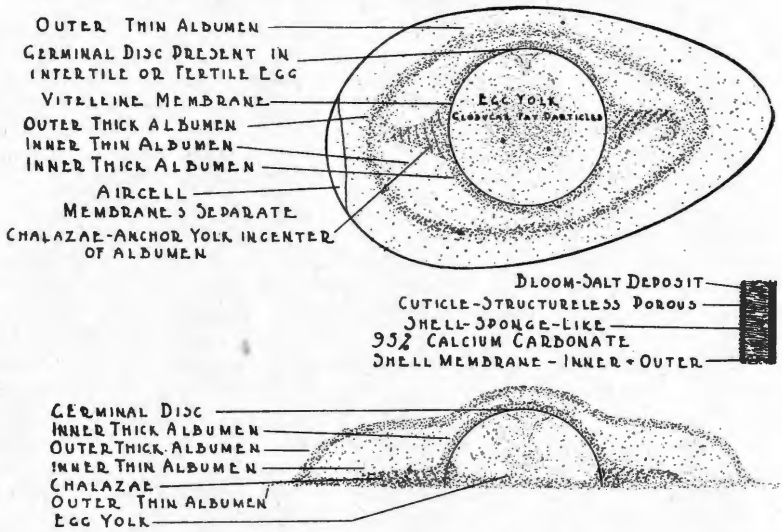
State College of Washington
EXTENSION SERVICE
Pullman, Washington

Poultry Pointers

No. 29 (Revised) July, 1942

EGGS AND THEIR CARE

The Poultry Council[1] of the State College of Washington



Structure of the Egg

Figure 1.

QUALITY IN EGGS

Exterior Quality. An egg is judged to be of good exterior quality if the shell is smooth, properly shaped, evenly colored, and absolutely clean.

Interior Egg Quality by Candling. The interior quality of an egg is determined by the process of candling the egg. To be of good interior quality, the yolk must be uniformly light-colored and well-centered, the chalazae (Figure 1) must be indistinct, and a small air cell is desirable, as it shows proper handling.

Yolk Color. Egg yolk color varies from a light cream to a deep orange, depending principally on the amount of pigment-bearing feeds the birds receive. Yellow corn, alfalfa products, and fresh green feeds are the most

[1] THE POULTRY COUNCIL of The State College of Washington is composed of staff members of the State College of Washington at Pullman and Puyallup engaged in teaching, research and extension problems of poultry husbandry and pathology.

Published and distributed in furtherance of the Act of May 8, 1914, by the State College of Washington, Extension Service, F. E. Balmer, Director, and U. S. Department of Agriculture cooperating.

common sources of this pigment. The Washington laying rations fed according to the description in Poultry Pointers No. 20 will produce light-colored yolks.

Albumen Color. Normally the albumen is a clear, semi-transparent mass. However, smoke-colored albumens are frequently noticed. Some old hens will lay a characteristically milky albumen. Slightly smoky or cloudy albumens are quite common in eggs. This condition is normal in eggs less than one day old, in eggs in which the albumen stands up well around the yolk, and in eggs that have been held at low temperatures. Thus, a cloudy albumen is indicative of freshness, high quality, and proper holding temperatures.

ABNORMAL EGGS

Double-yolk Eggs. Pullets just starting to lay are likely to be erratic in ovulation for the first few months. Occasionally two or more yolks mature at the same time and start down the oviduct together, thus producing a large number of double-yolk eggs. Few hens lay double-yolk eggs consistently.

Shelless and Soft-shelled Eggs. The large number of shelless and soft-shelled eggs produced during the first few weeks after the pullets come into production is due to erratic ovulation and abnormal functioning of the uterus, which is the shell-forming portion of the oviduct. Thin-shelled eggs may be caused by an insufficient supply of calcium or vitamin D.

Thin- and Rough-shelled Eggs. Shell thickness may be an inherited characteristic. Rough, pebbly, chalky, or thin egg shells may be the result of an abnormal uterus, but frequently result from an unbalanced calcium-vitamin D ratio in the diet or from an extended period of heavy production.

Blood Spots. Sometimes when the yolk follicle ruptures to release the yolk into the oviduct, a tiny blood vessel is broken and a drop of blood is carried along on the yolk. A large clot may fuse with the albumen and cause a bloody egg. Such eggs are classed as inedible, solely because of appearance.

Meat Spots. Meat spots are usually small pieces of tissue that have been sloughed off from the oviduct and have been included in the albumen as it was formed in the isthmus of the oviduct. These spots are usually found in the thick albumen and the chalazae.

There is some proof that certain hens have a tendency to produce eggs with either of these faults.

CAUSES OF POOR EGGS

Shrinkage. Holding of eggs in an unsatisfactory room will cause shrinkage due to evaporation of moisture from the eggs. Egg shells are so constructed that they are porous and permit exchange of gases. Thin- or porous-shelled eggs seem to be especially susceptible to shrinkage.

Dirty Eggs. The most frequent causes of dirty eggs are dirty nests, dirty yards, insufficient nests, and infrequent gathering. Damp, dirty litter, water fountains too close to nests or feed hoppers, dirty containers, and a dusty egg room—all contribute to the causes of dirty eggs.

Checked Eggs. "Chex" (cracked eggs) are the result of careless handling, too few nests, infrequent gathering, poor containers, and thin shells. They constitute a loss to the poultryman that may be overcome.

PRACTICES AFFECTING EGG QUALITY

Reduce Blood Spots. An abnormal increase in the number of blood spots may sometimes occur. This is generally caused by rough handling or

frightening of the birds. To prevent blood spots, avoid rough handling and frightening of the birds.

Keep Eggs Clean. Clean nests are the first essential in the production of clean eggs. (See Poultry Pointers No. 30.) Clean, dry litter and well-drained yards are of prime importance. Eggs soiled with droppings, straw stains, blood or yolk stains are classified as dirty eggs. Dirty eggs may be cleaned with abrasives such as sandpaper or steel wool. It takes more time to clean eggs than it does to keep them clean.

Gather Eggs Frequently. At least one nest should be provided for every five hens, and the eggs should be gathered at least three times daily in fall and winter and four times or more when the temperature rises above 70° F. in the laying house.

Cool Eggs before Casing. It has been found that eggs placed in the cases while warm require at least 12 hours to cool down to room temperature. Those held in galvanized buckets cool in three-fourths of that time (nine hours), and when the eggs are gathered and held in wire baskets, less than half the time (five hours) is required to reach the same temperature.

Temperature and Humidity. A temperature of 60° F. or lower seems to be entirely satisfactory for holding eggs a short time if a humidity of 75-78 per cent is maintained.

Cool and Humidify Cases. It is very important that the case, with fillers and flats, be cooled before the eggs are placed in it. Eggs placed in a warm, dry case lose moisture rapidly and the grade is lowered as a direct result. Surplus cases should be kept in the humidifier. **A dry case may draw as much as a pound of moisture from 30 dozen eggs in 48 hours.**

Hints on Casing Eggs. Extra large or long eggs should be placed in the corners or outer edges of the fillers. If there is a large number of big eggs, staggering them with slightly smaller eggs will give a safer pack. Eggs should always be placed in the case **small end down.** If the large end is placed down, the air cell is more likely to become loosened, resulting in a lowered grade.

BREEDING FOR DESIRABLE EGGS

Rough shells, as well as other abnormal egg characteristics, are associated with certain individuals. The inheritance of egg weight and shell color has long been accepted, but other characters such as quantity and quality of albumen, shell strength, and the ability of the egg to withstand heat, age, and transit are problems which the breeder may assist in solving. Selection and breeding for desirable egg characters is one way to improve the initial quality of the egg.

COOL, HUMID EGG ROOM A NECESSITY

An egg room may be built above the ground or under the ground. An egg room that is below, or partially below, the ground is to be preferred to one that is built on the ground. The cool air does not rush upstairs to get out of a room that is below the ground level. It does rush out when a door is opened on the floor level of the egg room. The doors and windows (if any) of an egg room should be on the north side.

Figure 2 shows the floor plan of an above-ground egg room. It is 8 x 10 feet, outside measurements. This room may be installed in a corner of another room, or it may be constructed as a separate building. When so constructed, it should have a concrete foundation. The floor may be of wood or concrete, or a dirt floor covered with sand. The walls are constructed of 2 x 6-inch studding sheathed inside and out, and with shavings

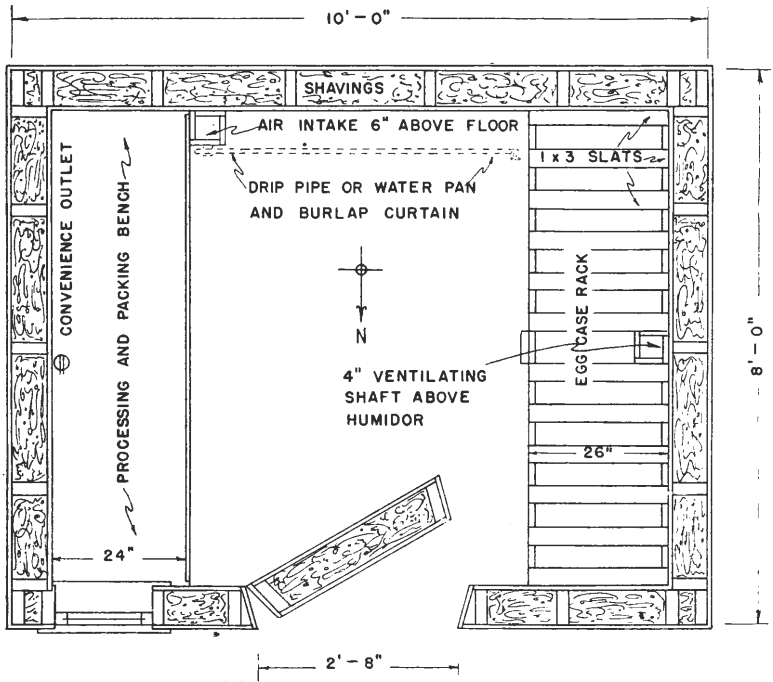


Figure 2. Floor plan of egg room.

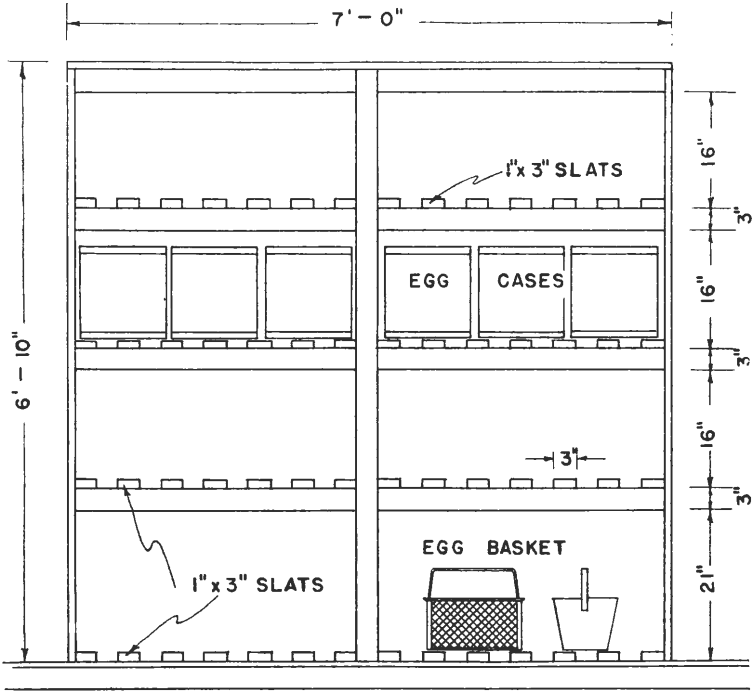


Figure 3. Rack for egg cases.

or sawdust packed between for insulation. The building is designed to be seven feet in the clear from the floor to the ceiling, or to the joists that support the ceiling.

The floor plan shows a work bench that is 24 inches wide and should be 30 inches above the floor. The rack on the opposite side is intended to hold empty cases on the upper shelf and full cases on the lower shelves (See Figure 3). The double electric plug may be used for a light or a candler and an electric fan, used to increase air circulation or humidity. A window is shown on the north end above the work bench. Some light is needed when entering an egg room before the artificial light is turned on.

The floor plan shows the location of a water pan or drip pipe about six inches from the rear wall. When constructing this, it should be approximately 6½ feet above the floor. A burlap curtain should be hung below the drip pipe, or one end may be immersed in and suspended from the water trough. The edge of the water pan over which the curtain hangs should be rounded, as sharp edges compress the burlap fiber, shutting off the water. This burlap curtain tends to humidify and cool the air. If the ventilating flues, indicated in the drawing, do not provide enough movement of air, an electric fan may be used.

The only ventilators shown in the plan are an outlet flue going from a point immediately over the egg rack up through the ceiling and the roof and an intake flue coming from a point above the roof and projecting through the ceiling to a point six inches above the floor. It may be necessary to have a sliding damper in this intake flue in order to control the movement of air. It should always be open at night.

Figure 2 shows a double insulated door opening inward. This door might better be opened outward in a building constructed above the ground.

Figure 4 shows the same egg room sunk four feet below the ground and projecting three feet above. In this case a six-inch concrete wall is used in place of the frame construction shown in Figure 2. An area-way with six steps and seven risers is shown going from the ground level to the floor level of the egg room. This stairway is covered with a horizontal

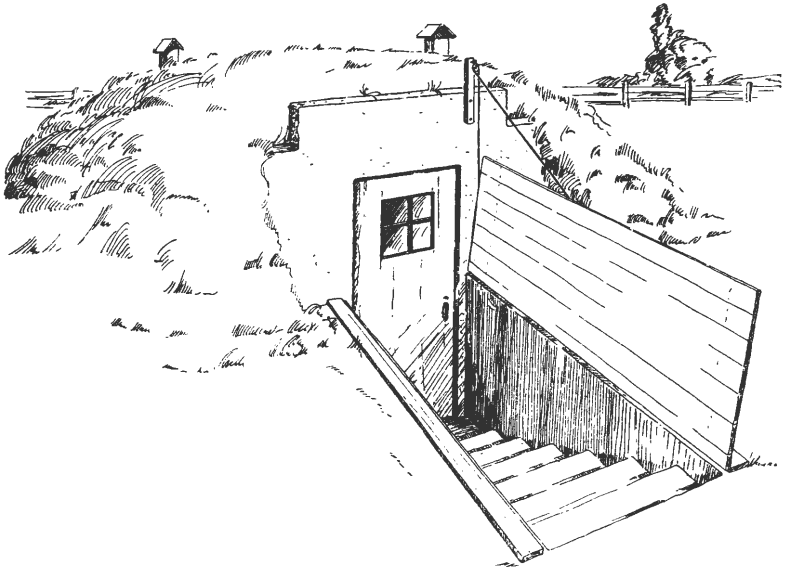


Figure 4. Below-ground egg room.

door, which should slope about two inches from the front of the building to the top of the stairs. A counterweight hung as indicated in the drawing makes the door easy to lift.

The perpendicular door at the foot of the stairs opens inward, as shown in Figure 2. It is two feet eight inches wide and six feet four inches high. The concrete wall above the door is extended two feet above the level of the construction wall in order to keep the dirt in place. The excavated dirt is piled around the walls and over the flat roof of the cave, in order to give perfect insulation. Grass may be planted in this dirt. This should be watered often to keep it green. The moisture will also increase the humidity of the room and the evaporation from the roof will have a cooling effect.

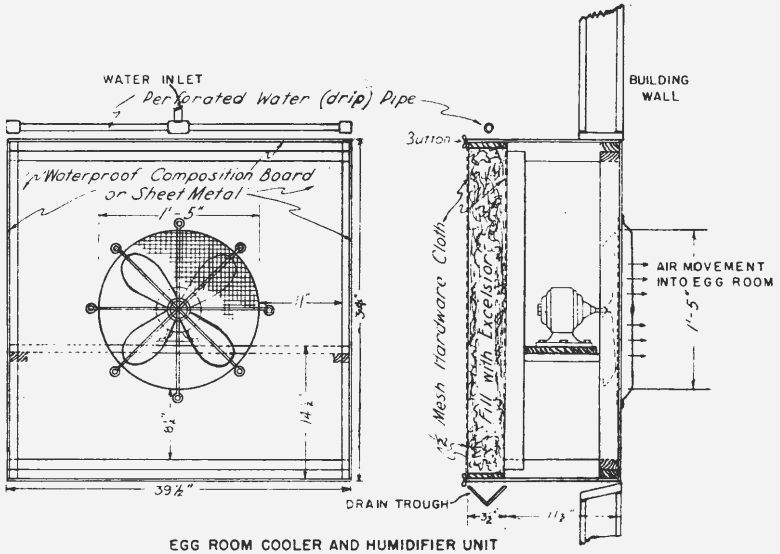
It is suggested that 2 x 8 inch timbers spaced one foot apart, with cross pieces between to keep them from buckling, be used for the roof of the cave. The boards covering these timbers should be covered with sheet metal, tar paper, or a two-inch layer of a rich mixture of concrete. This will keep the lumber from rotting, and will support the weight of the insulating earth.

This type of egg room is highly recommended. It may be constructed of logs or rocks if concrete is found too expensive. The floor may be of concrete, or dirt covered with sand. If the floor is kept wet, this may provide enough humidity without the use of the wet burlap curtain. **A well-built egg room will pay big dividends in the increase of quality eggs.**

Musty or moldy odors are often a problem in humid egg rooms. A dilute solution of copper sulfate (blue vitriol) sprayed over the walls, ceilings, floors, benches, etc. will prevent this condition.

EGG ROOM COOLER AND HUMIDIFIER UNIT

A very satisfactory method of egg room cooling and humidifying is pulling air through a porous wet screen such as excelsior. An electric fan or blower is of course required to get a rapid and constant movement of air, but only a very small motor (1/40 h.p.) is needed so the expense of equipment and cost of operation are low. A box about three feet square should be constructed in the wall or in a window of the egg room. The inside



EGG ROOM COOLER AND HUMIDIFIER UNIT
INSTALLED IN WINDOW OR WALL

Figure 5. Construction of humidifier unit.

surface of this box should be solid except for a hole in the center the size of the fan blades. The fan motor should be set on a shelf inside the box so located that the blades will be just inside the hole and force the air out of the box. The box should be about 15 inches deep and the front or outside portion of it should overhang the window sill or outside wall of the building. The outer part of this cooler and humidifier is built in a separate piece to facilitate filling with excelsior, and consists of two pieces of hardware cloth attached to a wooden framework that is about 3½ inches wide. The wooden framework should be made in two pieces and held together with a couple of bolts which facilitates repacking with clean excelsior when this material becomes dusty or moldy. There should be an inch wide opening along the top and bottom of the box for the water drip and drain, respectively. The excelsior box fits into the humidifier unit from the outside and is held in place by thumb buttons.

Probably the best way of keeping the excelsior wet is by means of a perforated pipe directly over the excelsior which constantly drips water on it. An eaves trough may be placed underneath the excelsior to carry off

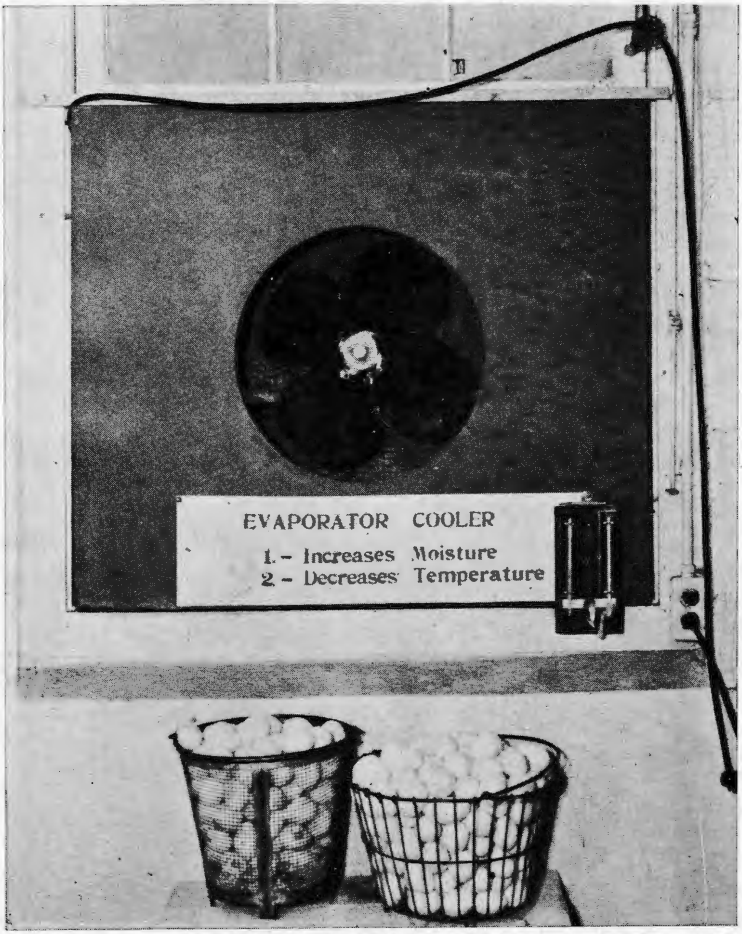


Figure 6. View of egg room cooler and humidifier from inside of egg room. Note two satisfactory egg gathering and holding baskets.

surplus water. Little difficulty will be experienced in keeping egg room temperatures below 68 degrees F. and humidity above 75 per cent with such an arrangement.

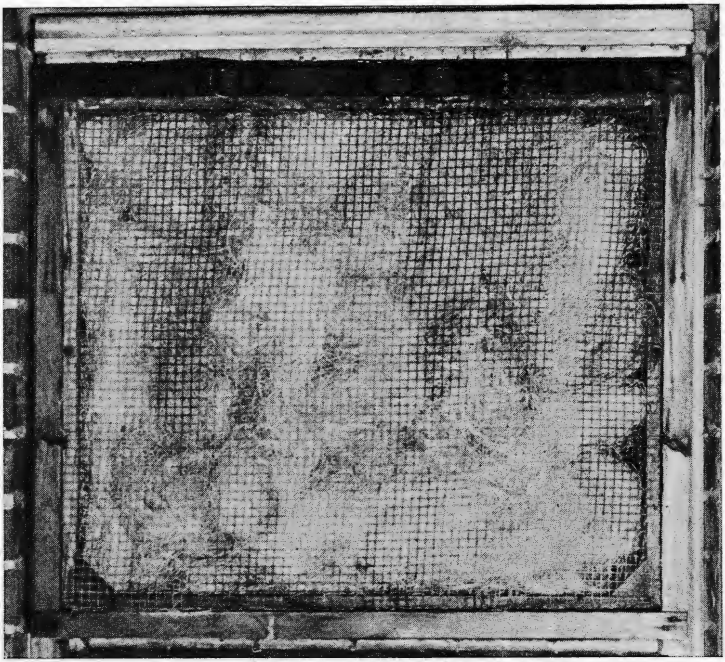


Figure 7. Outside view of egg room cooler and humidifier. Note buttons on each side. These hold in frame containing excelsior. Also note hardware cloth covering excelsior. The water drip drough is at bottom of excelsior frame.

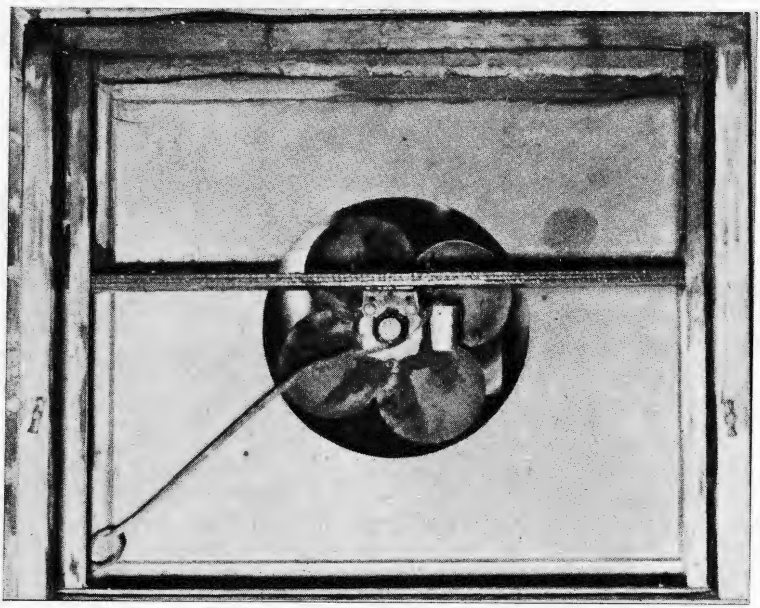


Figure 8. Internal view of egg room cooler and humidifier unit. Note support on which fan motor sets. The excelsior frame is removed.

THESE PICTURES ARE UPSIDE DOWN.