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Essentials of Poultry Sanitation

ANDREW W. UREN

Fig. 1.—These pullets are being raised on clean ground in a clean range shelter. Note the excellent growth of green feed—alfalfa—and the absence of permanent shade.

Though losses suffered from infectious diseases and parasites are the greatest obstacles to success with poultry, it has been demonstrated that most of these diseases can be prevented by following a few simple rules of sanitation and providing the necessary housing and feeding facilities. If sanitation is neglected, however, any poultry venture is doomed to failure sooner or later, for profits diminish and eventually disappear as the losses from disease and parasites increase.

Disease germs, worm eggs and coccidia do not rain down from the skies. They can be prevented from infecting poultry without expending one penny for cures or drugs. The essential steps in preventing losses from poultry diseases and parasites are described in the following pages.

Sanitary Equipment and Range

The building site should be chosen to provide free, natural drainage away from the house in all directions.

If the flock is larger than 100 birds, at least two fenced runs should be provided.

The general problem of housing is of the utmost importance in the prevention of disease. The poultry house should include the following essential features:

(1) Adequate ventilation without drafts and sufficient warmth without accumulation of moisture on the walls and ceiling. Cold and drafty houses that do not have proper ventilation are conducive to outbreaks of roup and other respiratory diseases.

(2) Droppings boards or pits that are properly wired to prevent access of the birds to the droppings under the roosts. Disease germs, parasite eggs, and coccidia pass from infected birds in the droppings. Healthy birds must be prevented from coming in contact with the infectious droppings.

Fig. 2.—A systematic rotation of fenced runs that have been plowed and seeded to a green crop provides maximum insurance of a healthy flock.

(3) Equipment such as roosts, droppings boards, nests, and feeding hoppers should be easily movable. They should be so constructed and of such material that they can be quickly and thoroughly disinfected.

(4) Watering utensils that are easy to clean and disinfect. Many poultry diseases can be spread through the drinking water. The watering utensils should also be of a type that will prevent the birds from getting their feet and droppings in the water, and they should be placed on a stand high enough above the floor to prevent birds scratching litter into them.

(5) Fenced-in runs for the laying flock are necessary to permit the rotation of yards as a means of controlling parasites and increasing the pasture value of the green feed that can be provided each year. Disinfectants kill very few, if any, of the disease germs or parasite eggs in the soil. Plowing and seeding to any of the small grains is the best method now known to disinfect contaminated soil.

The natural elements that do kill germs and parasite eggs are direct sunlight, heat generated by the sun, and soil bacteria.

Experiments conducted at Kansas State College have demonstrated that the high temperatures of summer will kill all the eggs of the common roundworm on the surface of the soil and to a depth of six inches in unshaded places. In shaded places the eggs survive.

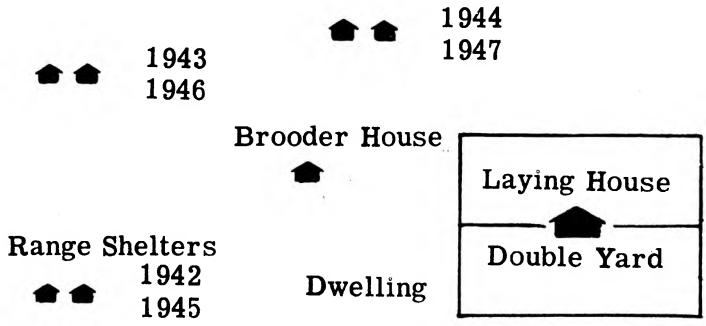

Fig. 3.—This figure illustrates the use of a yarding system for the laying hens in combination with a 3-year system of range rotation for young stock. Yarding the old flock makes it possible to have these ranges near the dwelling.

Plowing loosens up the soil and allows the summer heat to penetrate to greater depths. It also aerates the soil and increases the number of soil bacteria that destroy organic matter.

Permanent shade from shrubbery or trees is not desirable in chicken's runs because it protects and harbors disease germs and parasite eggs in the soil. Shade on the poultry runs is desirable and necessary. Shade can be safely provided by constructing movable racks with roofs 2 or 3 feet above the ground. The roof can be covered with burlap sacks, roofing tin, or straw. The racks can then be moved every 7 to 10 days, allowing the heavily contaminated areas to be exposed to direct sunlight and heat.

Start with Healthy Chicks

Secure quality day-old chicks whose parent stock has been efficiently blood tested for pullorum disease. Cheap chicks are in the end the most expensive because they usually lack quality, vigor, and size. Chicks that are inferior in quality and vigor usually are much more susceptible to infectious diseases that may result in a large death loss. Then, too, inferior chicks do not mature as quickly as the better quality chicks and so require more feed, adding materially to their cost. When the death losses, added cost of feed, and the losses from lower egg production are added together, it will be found that the cheap day-old chick was a very poor investment.

The brooder house must be thoroughly cleaned before the chicks arrive. A good disinfectant for cleaning the brooder house can be made by dissolving a can of ordinary household lye in 12 gallons of water. Watering utensils, feed hoppers or any other equipment

that has been used by mature birds must be thoroughly cleaned and distinfected before being used in the brooder house by the chicks. If the chicks are to be protected from infection with worm eggs, coccidia, and disease germs that may be in the soil, a wire floor such as is provided in a summer range shelter or sunporch is necessary so the chicks can be exposed to sunlight without coming in contact with the soil. If a wire floor is not used and the chicks are allowed on the ground, the brooder should be placed on ground where chickens have not ranged for at least two years.

Many disastrous disease outbreaks can be prevented by allowing no one but the person caring for the chicks to enter the brooder house. Coccidia, worm eggs and infectious diseases such as bronchitis and trachitis can be carried into the brooder house on the shoes and clothing. It is advisable to keep a pair of shoes or rubbers at the door of the brooder house for the attendant to put on while working in the house. This will aid in preventing infections from being carried in the house on the shoes of the attendant. If the attendant caring for the chicks also works with mature birds it is advisable to keep a smock or an extra pair of overalls at the door of the brooder house that can be put on to cover the clothing that may be carrying infectious material picked up in the laying house.

Care of Growing Stock

Remove pullets from brooder house at 8 weeks of age and put them in a range shelter on ground that chickens have not ranged over for a period of at least 2 years. This period of time is required to starve the parasites that cause mortality in young stock and later death losses in the adult flock. Unlike the yards for the laying flock these young stock ranges do not require fencing.

Vaccinate the pullets between the ages of 8 and 12 weeks with the fowl pox vaccine to protect the birds against a possible outbreak of this disease.

Leave pullets on range until they are ready to go in laying house in the fall. Housing should be done when 5% production is secured or by September 30—whichever date is earlier.

Put pullets in laying house that has been thoroughly cleaned and disinfected. It is not advisable to mix pullets with older birds. Providing a clean house and keeping pullets separated from older birds is important because the pullets are more susceptible to diseases than old birds. In addition, older birds are carriers of infections to which they have built up resistance. When pullets are exposed to healthy appearing mature birds, death losses among the pullets may be severe. If only one laying house is available for pullets and the old birds, it is advisable to separate them by putting a partition in the house.

Watch closely for lice and treat the flock with sodium fluoride or paint roost with 40% nicotine sulphate an hour before chickens go

to roost. In either case a second treatment should be applied 10 days later to kill the lice that have hatched from the lice eggs or nits since the first treatment.

In Case of a Disease Outbreak

Remove all sick birds from flock.

One or more of the sick birds should be submitted to a competent person for examination and diagnosis. It is recommended that the local veterinarian be consulted or that two or three of the live affected birds be sent by express to the Veterinary Science Department, University of Missouri, Columbia, Missouri. Do not rely upon persons who are untrained in the diagnosis of diseases although they may be well posted on all other phases of poultry production. Many of the infectious and contagious diseases can only be diagnosed by laboratory methods. Correct procedure in the control of any disease is dependent upon an accurate diagnosis.

While waiting for a diagnosis, put a disinfectant in the drinking water. Some of the infectious and contagious diseases may be transmitted from sick birds to healthy birds through the drinking water.

When the disease has been diagnosed, proven methods of sanitation and treatment can be applied.

The old saying that an ounce of prevention is worth a pound of cure is certainly true when applied to poultry diseases and parasites. This becomes evident in the experience of the poultry raiser who disregards preventive measures, and then attempts to control an outbreak of disease by dosing his birds with worm remedies. Such remedies are seldom used until the birds are sick and have been set back anywhere from two to six weeks in development. The loss in feed alone would have more than paid for all equipment necessary to have prevented the worm infection in the beginning. In addition, egg production will be delayed in the fall when prices are highest.

Good sanitary and management practices will pay dividends in the production of poultry. A successful plan of management must include complete sanitation.

Disinfection Checks Spread of Disease

Disinfection is but one of the steps in an effective sanitation program. It means killing the disease producing germs.

Cleaning is the most important part of disinfection because thorough cleaning alone removes most of the danger from germs. It is also impossible to disinfect dirty houses or equipment because disinfectants lose their killing power quickly in the presence of filth. They are most efficient when applied to clean or relatively clean surfaces. Consequently, thorough cleaning is a first essential.

Disinfection is a waste of time and money unless the source of the infection is first removed. Disease germs and internal parasite eggs do not grow outside the bodies of chickens except in rare instances. Diseased birds are the source of infection. Disinfection

is of value only after the *carrier* birds are first removed.

All houses and equipment that have been previously used by older stock should be thoroughly cleaned and disinfected before being used for younger birds.

Disinfectants and Their Power to Kill Germs

Sunlight is a valuable disinfectant under the proper conditions, but it loses its power to kill germs in passing through ordinary window glass. Even a thin film of water covering germs will prevent the killing rays of sunlight from reaching them.

Sunlight in common with other disinfectants exerts its maximum effect only on clean surfaces. A thin film of dust tends to protect germs from sunlight, and those contained in droppings or floor litter are protected with the exception of those that are directly exposed to sunlight.

Heat will kill germs under certain conditions. Most germs are killed when submerged in boiling water for five minutes. Consequently, all utensils can be disinfected by immersion in boiling water for five minutes or more.

Cold is not effective in killing germs. Freezing not only fails to kill many germs but it is even an effective method of preserving germs from one summer season to the next. Some infectious diseases cease to spread rapidly during the winter because insect carriers are dead and the germs are sealed temporarily within the frozen discharges, manure and soil.

Disinfection by Chemical Means

When buying a disinfectant, the kinds of germs that are to be killed, the conditions under which it is to be used, its efficiency, and its cost are all factors that should be considered.

Buyers of disinfectants should be cautious in accepting statements as to their value unless the statements are printed on the label attached to the original container. Manufacturers can be held liable for any false claims made on the label, but they cannot be held liable for similar statements made by radio, in newspaper or magazine advertisements, by salesmen, or for printed claims that are not attached to the original container.

Common household lye is undoubtedly one of the most practical disinfectants for poultry houses and equipment. One 10c can containing 13 ounces of high test lye dissolved in 12 gallons of water will make a solution that, when applied properly, will kill all germs except the tuberculosis organism. A cold lye solution will kill germs, but a hot solution is more effective in dissolving and removing dirt. After the straw and manure have been removed and the poultry house and equipment swept as clean as possible, all surfaces should be thoroughly soaked with the lye solution. After the solution has had time to wet thoroughly and dissolve loose all adhering filth, the floor, walls, ceiling and all equipment should be vigorously scrubbed. The nests and droppings board should be

thoroughly scrubbed on all exposed surfaces. It is advisable to use a force spray pump so the disinfectant solution can be forced into all cracks, applied to the ceiling, and the lower side of the droppings board and roost poles.* After scrubbing and removing all filth with the lye solution, all surfaces should be soaked again with the solution in order to do a complete job of disinfection.

When it is possible to do so the practice of allowing the laying house to stand idle for approximately 30 days is desirable. This is particularly true in the late summer before the pullets are brought in from the range.

The frequency with which the poultry house and equipment should be disinfected will depend on the condition of the flock. It is a good practice to clean and disinfect the poultry house and equipment every six months. When birds are diseased the frequency of disinfecting a house will depend on the course of the disease. Sometimes the disease is stopped by removing the sick birds and cleaning and disinfecting. If, however, additional sick birds are found in the flock after the first culling and disinfection, it will be necessary immediately to repeat the culling and disinfection of house and equipment to protect the birds that still remain healthy.

Lime As A Disinfectant

The air-slaked and hydrated forms of lime, though frequently used as disinfectants, are useful only as deodorants or to soak up moisture. They do not have the power to kill germs.

Freshly slaked hard rock lime is an excellent disinfectant, yet it also loses its power to kill germs in 8 to 10 hours after it is slaked. When whitewash is used as a disinfectant it should always be made from freshly slaked lime and applied before it loses its power to kill germs. The following formula will make a good whitewash with power to kill germs: Slake 12 pounds of hard rock or quick lime in 2 gallons of hot water. After the lime has slacked, add 6 ounces of salt and 3 ounces of zinc sulphate dissolved in 3 pints of boiling water. Add to this mixture 3 pints of fresh skim milk and stir thoroughly. If the zinc sulphate is not available, it may be omitted. This whitewash or any other made by a different formula should be applied while it is still warm from the heat generated in slaking as it then has its maximum power to kill germs.

Chlorine As A Disinfectant

Disinfectants containing chlorine are effective in killing all types of germs except those of the tuberculosis group. Chlorine is limited in its use, however, because of the fact that it becomes inactive in the presence of organic matter. It is, therefore, recommended for use only on clean surfaces that are free of organic matter or as a disinfectant in drinking water that is free of organic matter.

Chlorine disinfectants can be purchased on the market in either

*Rubber packing washers should be used in pumps when lye water is applied as a spray. When leather packing is used it should be heavily greased and washed after the work is completed.

the liquid or powdered form. Directions for diluting or mixing with water to make a solution of the desired strength are usually printed on the container. Drinking water for chickens is not harmful when it contains as much as ¼ teaspoon or chlorine in 3 gallons of water. It should be remembered, however, that chlorine in drinking water is only effective when the water is kept free of organic matter such as feed, droppings, straw and other filth.

Potassium Permanganate

Potassium permanganate is fairly active as a germ killer. It is, however, corrosive to metals, loses its strength rapidly in the presence of organic matter and leaves a brown stain. Potassium permanganate should be used in a $\frac{1}{10}$ of a one per cent solution—¼ teaspoon in 1 gallon of water. The solution should be renewed as soon as it turns brown. The brown color is a sure indication that the solution has lost its power to kill germs. This disinfectant is rapidly replacing bluestone, or copper sulphate, which was formerly recommended as a disinfectant in the drinking water. Both potassium permanganate and chlorine are better germ killers than bluestone, especially in combatting a disease such as pullorum disease in baby chicks or fowl cholera in the adult flock.

Coal Tar Disinfectants

Phenol (carbolic acid) in a 5 per cent solution is effective against the tuberculosis group of organisms, yet for general use it has been largely replaced by other coal tar disinfectants which have greater power to kill germs and that are cheaper in price. A compound solution of cresol (*Liquor Cresolis Compositus* U.S.P.) is an excellent disinfectant and is effective against tuberculosis. It is, however, expensive for poultry house disinfection.

Saponified cresol, which is made to meet the specifications of the U. S. Department of Agriculture and closely approximates the effectiveness of compound cresol U.S.P., is probably the most satisfactory coal tar disinfectant for poultry equipment. One pint of saponified cresol in 3 or 4 gallons of water will make a 3 or 4 per cent solution.

Cresol (commonly called "straw colored carbolic acid" has the disadvantage of dissolving slowly in water. Warm water should be used in making the solutions and care should be taken to see that all of the solution dissolves in the water. Cresol disinfectant should not to be used unless there is a guaranteed "phenol coefficient" of not less than 6 printed on the label attached to the container. One pint of cresol in 2½ gallons of water will make a 5 per cent solution. This disinfectant should not be used in a solution that is weaker than 5 per cent because it is less efficient than the saponified cresol discussed in the preceding paragraph.

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