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**COOPERATIVE EXTENSION WORK IN
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FLORIDA STATE COLLEGE FOR WOMEN

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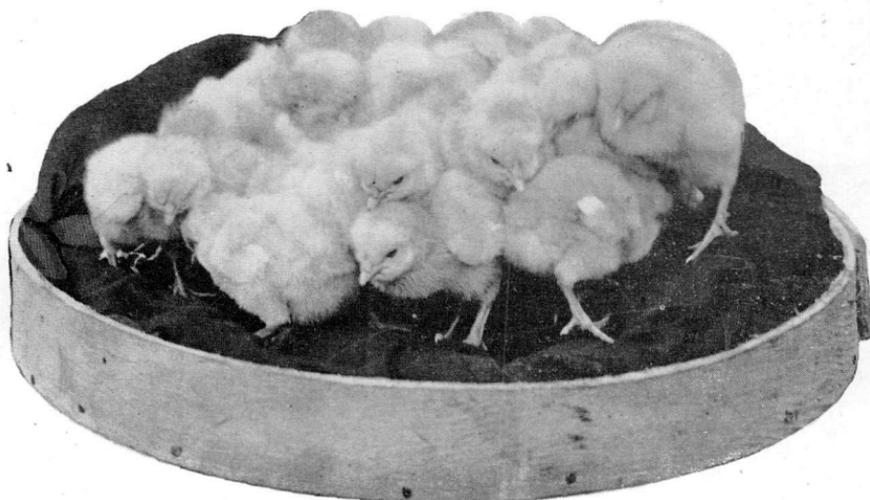
A. P. SPENCER, Director

**RAISING
CHICKS, BROILERS AND PULLETS**

By

N. R. MEHRHOF, Poultry Husbandman

A. W. O'STEEN, Extension Poultryman



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GROW HEALTHY CHICKS

Six Important Steps:

1. **Hatch early** — Before April 15th.
2. **Start with clean eggs and chicks** — pullorum clean.
3. **Keep brooder houses clean** — sweep, scrub and spray.
4. **Use clean land** — 2- or 3-year rotation.
5. **Feed a balanced ration** — containing all nutrients in proper proportion for normal growth.
6. **Separate pullets from cockerels** — as soon as sex can be determined.

Adoption of these 6 steps results in healthier chicks, broilers and pullets.

Keep chick mortality below 10 percent.

Failure to adopt 1 or more steps results in higher mortality, higher costs and lower returns. See Tables 1 and 2.

RAISING CHICKS, BROILERS AND PULLETS

By N. R. MEHRHOF and A. W. O'STEEN

INTRODUCTION

The success of a poultrman is determined largely by the way he is able to raise baby chicks each year. Baby chicks are a vital part of every poultry farm, whether small or large.

Baby chicks are the foundation of each year's flock. Success in brooding and rearing chickens for meat and egg production is largely a matter of good stock plus good management.

Whether chickens are raised for meat production exclusively or pullets are kept for egg production, at least a part of the flock is renewed every year. Broiler producers renew their flocks several times a year, while egg producers renew part or all of their flocks at least once a year.

BREEDS OF CHICKENS

There are many breeds and varieties of chickens that do well in Florida. The question of which breed to select is often asked, and the answer depends on many factors.

TABLE 1.—FOUR-YEAR AVERAGE RESULTS, GROW HEALTHY CHICKS CAMPAIGN, SHOWING IMPORTANCE OF ADOPTING THE 6 FACTORS.*

Factors Adopted	Number of Chicks	Number Dying	Mortality in Percent
6	47,577	3,217	6.76
5	35,686	7,873	22.06
4	11,240	3,318	29.51

* Clean brooder houses and clean land were the most important 2 factors.

In general, chickens have been classified economically as egg, dual- or general-purpose, and meat breeds. The egg breeds would include the smaller birds such as Leghorns, Anconas and Minorcas. The dual- or general-purpose breeds include the New Hampshires, Rhode Island Reds, Plymouth Rocks and Wyandottes. The meat breeds are composed of Jersey Black Giants, Cornish and Brahma.

The first factor to consider is the type of poultry farming to be done. Poultry raisers who are interested primarily in table

or market egg production should select 1 of the egg breeds or 1 of the dual-purpose breeds that has been bred for high egg production. Over a period of years the Single Comb White Leghorn has been kept on most commercial egg farms. Some large flocks of New Hampshires have been started, and on these farms hatching eggs are produced in addition to table eggs.

TABLE 2.—RELATION OF CHICK MORTALITY ONE YEAR TO EGG PRODUCTION, ADULT MORTALITY AND RETURNS THE FOLLOWING YEAR.*

Percent Mortality		Eggs per Bird	Value of Eggs Over Feed Costs
Chicks	Layers		
8	9	168	\$2.80
15	10	155	2.49
26	12	143	2.15
35	13	140	2.00
55	19	116	1.66
Av. 26	11	145	\$2.29

* These data were obtained by F. W. Brumley, Extension Economist, from records kept by Florida poultrymen.

For the general farm or backyard poultry producer, 1 of the general-purpose breeds would be preferable.

The broiler producers in Florida are using 1 of the general-purpose breeds. At this time the New Hampshire is the most

Fig. 1.—Ready-to-lay pullets on range, housed in summer shelter.



popular; however, Rhode Island Reds, Plymouth Rocks and cross-breeds are also being used as broiler chicks.

METHODS OF GETTING STARTED

There are several methods of starting into the poultry business, such as by the purchase of

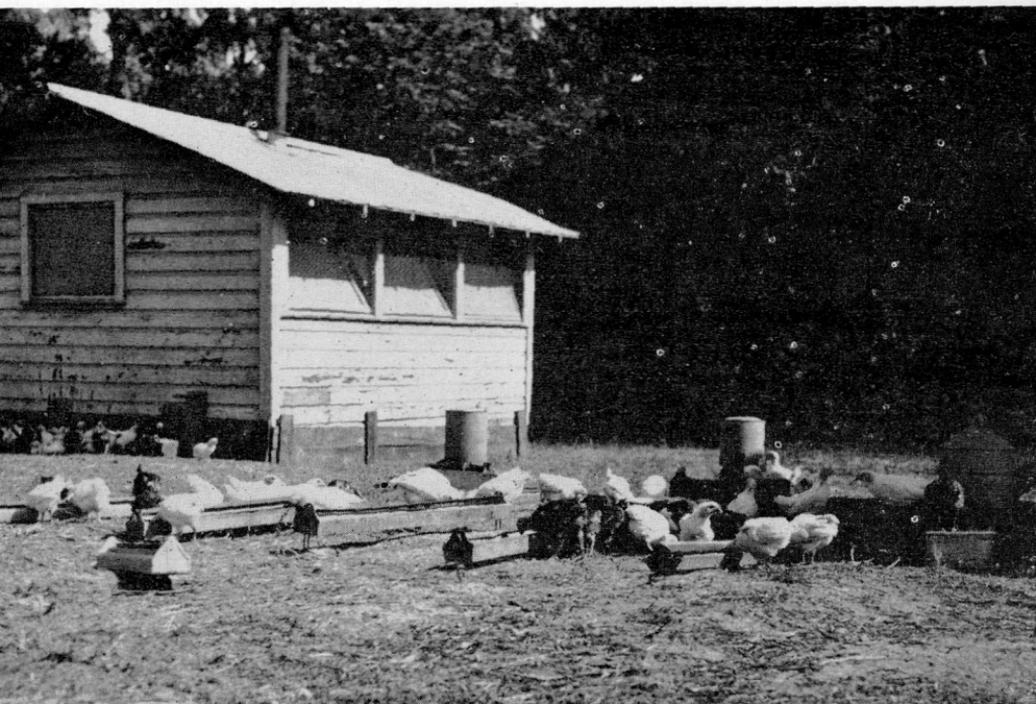
1. Hatching eggs
2. Baby chicks
 - a. Straight-run
 - b. Sexed chicks
3. Started chicks
4. 10- to 12-weeks-old pullets
5. Ready-to-lay pullets
6. Breeding stock.

Each method has been used, but the more common methods are to start with baby chicks or started chicks.

HATCHING EGGS

Hatching eggs should be saved from eggs produced by well-bred birds. These breeders should display high egg production,

Fig. 2.—Colony brooder house with feeders and waterers, which can be moved each week, on the outside.



good egg size, fast rate of growth, livability and freedom from disease, and be typical of the breed.

Hatching eggs should be uniform in shape, size and color.

Size of Egg.—It is not desirable to use eggs weighing less than 2 ounces each for hatching purposes. According to a number of research workers, there is a high correlation or relationship between size of egg and size of chick hatched.

Shell Color.—With breeds of chickens producing white eggs, do not use eggs for hatching purposes that have tints of color; select chalk-white eggs. Brown eggs should be of a uniform shade or tint.

Pointers in Saving Hatching Eggs.—Do not use dirty eggs for hatching purposes.

Do not wash hatching eggs. Washing tends to open the pores and hasten evaporation. Slightly soiled eggs may be cleaned with steel wool or a damp cloth.

Do not hold hatching eggs more than 7 to 10 days; the shorter the time the better. When eggs are held for hatching purposes keep them in a cool place—50 - 55° F. If they are kept too warm (68° F. or above) germ development will start.

Gather the eggs 3 or 4 times daily.

Handle hatching eggs carefully, since rough handling may cause a loosening of the air cell and thus lower hatchability.

If the eggs are placed in an egg case for holding, pack them large end up. It is not necessary to turn the eggs unless they are held longer than 7 days.

Select eggs for incubating that are uniform in size and shape, sound in shell and uniform in shell color. Reject all eggs having ridges or rough surfaces.

BABY CHICKS

Start with Quality.—In the poultry business it is most important to start with quality. Quality chicks mean chicks that come from stock which is healthy, free of disease; stock which has been bred for high egg production, livability, egg size, rapid growth and fast feathering.

Consider quality first and price second (Table 3).

Use care in purchasing chicks—

1. Check on list of breeders and hatcheries.
2. Buy chicks of well-established and proven strains.
3. Try to find the chicks as near home as possible.

4. Obtain chicks from stock which has been tested and found to be free of pullorum disease.

TABLE 3.—CHICK COST PER PULLET WITH VARYING PERCENTAGES OF MORTALITY AND CULLING AND DIFFERENT PRICES FOR BABY CHICKS.

50% Pullets and 50% Cockerels.

Mortality and Culling in Percent	Cost of Day-old Chicks					
	10 Cents	12 Cents	14 Cents	16 Cents	18 Cents	20 Cents
0	20	24	28	32	36	40
5	21.0	25.2	29.5	33.7	37.9	42.1
10	22.2	26.6	31.1	35.6	40.0	44.4
20	25.0	30.0	35.0	40.0	45.0	50.0
30	28.6	34.3	40.0	45.7	51.4	57.1

“STARTED” CHICKS

Chicks that have been fed, watered and brooded by the hatchery operator usually from 2 to 4 weeks before they are shipped or delivered to the customer are known as “started” chicks.

Started chicks cost more than day-old chicks, the price depending on the age at time of shipment. There is a demand for these started chicks because some purchasers wish to avoid the first few weeks’ period of brooding.

Many hatchery operators keep their started chicks in battery brooders. When a customer secures started chicks he should make sure that the chickens become adapted to brooding on the floor. Watch the chicks closely for the first few nights to see that they are evenly distributed under the hover.

10- TO 12-WEEKS-OLD PULLETS

Some poultry raisers do not care to brood chicks and so wait till the birds are partially grown and then purchase only the desired number of pullets. This method is more expensive than starting with chicks. The time of year is a factor as to whether this method is best.

READY-TO-LAY PULLETS

Some producers have found it desirable to start with ready-to-lay pullets. The cost is higher than in any of the other methods mentioned, but it has the advantage in that returns in the form of eggs start at once.

BREEDING STOCK

One can make a start in the poultry business by purchasing breeding stock. The person who is interested in high quality stock and is planning to develop his farm into a poultry breeding farm will find that this method is very satisfactory but expensive.

BUY QUALITY NO MATTER HOW YOU START.

THE NATIONAL POULTRY IMPROVEMENT PLAN

The national Poultry Improvement Plan was started July 1, 1935, with the purposes of improving the breeding and production qualities of poultry and to reduce losses from pullorum disease. In Florida, this plan is supervised by the State Live Stock Sanitary Board, Tallahassee.

Following is a brief explanation of the disease classes and breeding stages of the National Poultry Improvement Plan.

A. Disease Classes of the Plan

1. **Pullorum-Tested Flocks.**—These flocks shall meet the following requirements: (a) All chickens to be used as breeders shall be tested for pullorum disease when more than 5 months of age, and shall contain fewer than 5 percent of reactors, the last test being made within 12 months immediately preceding the date of sale of hatching eggs or chicks from such flocks; (b) all indicated carriers of pullorum disease shall be removed from the premises on completion of the test.
2. **Pullorum-Controlled Flocks.**—These flocks shall meet the following requirements: (a) All chickens to be used as breeders shall be tested for pullorum disease when more than 5 months of age, and shall contain fewer than 2 percent of reactors, the last test being made within 12 months immediately preceding the date of sale of hatching eggs or chicks from such flocks; (b) all indicated carriers of pullorum disease shall be removed from the premises on completion of the test.
3. **Pullorum-Passed Flocks.**—These flocks shall meet the following requirements: All chickens on the premises shall be tested for pullorum disease when more than 5 months of age, and shall contain no reactors, the last test being made within the testing year immediately preceding the date of sale of hatching eggs or chicks from such flocks.
4. **Pullorum-Clean Flocks.**—These flocks shall meet the following requirements: (a) All chickens to be used as breeders shall be tested for pullorum disease when more than 5 months of age, and shall contain no reactors in 2 consecutive tests not less than 6 months apart, the last test being made within the testing year immediately preceding the date of sale of hatching eggs or chicks from such flocks.

B. Breeding Stages of the Plan

1. **Approved Breeding Stage.**—This breeding stage provides for U. S. Approved flocks, U. S. Approved hatching eggs, U. S. Approved chicks, and U. S. Approved hatcheries. Both males and females are to be selected for constitutional vigor and for standard breed and production qualities and banded by either State inspectors or flock-selecting agents.
2. **Certified Breeding Stage.**—This breeding stage provides for U. S. Certified flocks, U. S. Certified hatching eggs, U. S. Certified chicks, and U. S. Certified hatcheries.

The males are to be from U. S. Record of Performance single male matings.

The females may be selected by either State inspectors or flock-selecting agents.

All flocks are to be inspected and certified at least once each year by a State inspector.

Hatching eggs are to weigh at least 1 11/12 ounces each and average at least 24 ounces a dozen.

Each hatchery is to be inspected by a State inspector at least twice during the hatching season.

3. **Record of Performance Breeding Stage.**—This breeding stage provides for U.S.R.O.P. flocks, U.S.R.O.P. hatching eggs, U.S.R.O.P. chicks, and U.S.R.O.P. breeding stock.

The females are to be trap-nested and, to qualify, must lay 200 or more eggs in 1 year. Detailed records are to be kept on all operations.

The males are to come from hens which have laid 200 or more eggs in 1 year.

Both males and females are to conform reasonably well with standard requirements.

Eggs during the first year of laying are to weigh on an average at least 24 ounces to the dozen and thereafter average at least 25 ounces to the dozen.

All flocks are to be inspected by an R.O.P. inspector at least seven times during the year.

All chicks are to be individually pedigreed and wingbanded at hatching time.

4. **Register of Merit Breeding Stage.**—In this most advanced breeding stage recognition is given only to U.S.R.O.P. males and U.S.R.O.P. females whose progeny excell in performance.

A U.S.R.O.P. male must have at least one-third of his daughters that are entered and a minimum of 20 that qualify as U.S.R.O.P. females.

A U.S.R.O.P. female must have at least one-third of her daughters that are entered and a minimum of 4 that qualify as U.S.R.O.P. females.

For a more detailed discussion of this plan write the State Live Stock Sanitary Board, Tallahassee.

POULTRY CALCULATIONS

Number to Buy.—Buy according to the amount of equipment available. Check on capacity of house, brooder stove and available feeding and watering equipment.

Overcrowding is one of the biggest problems in chick raising.

To produce 100 good pullets it is necessary to buy 250 to 300 quality straight-run chicks.

Sexed pullet chicks are bought at the rate of $1\frac{1}{2}$ pullet chicks for each mature laying pullet needed. Allowance must be made for loss and for incorrect sexing, brooding and growing mortality, and culling before production.

Number of Chicks Needed.—Each year poultry raisers are confronted with the problem of knowing just how many chicks to purchase or hatch.

These 2 items should be considered to determine the number:

1. Amount of equipment, both brooder houses and laying houses.

2. Number of pullets needed to fill laying houses.

Mortality and culling the laying flock must be anticipated, together with a decision as to percentage of pullets to be maintained in the flock.

Pullets Needed.—The number of pullets needed to fill the laying houses should be known so as to assist in determining the number of hatching eggs or baby chicks to start with.

As a general practice about $\frac{2}{3}$ of the laying flock is composed of pullets. The percentage of pullets in the flock varies considerably from farm to farm. There are some 100% pullet flocks. Some of the factors which tend to influence this percentage are:

1. Egg production — if egg production is relatively low a higher percentage of the birds will be culled during the year.

2. Mortality — during the year mortality reduces the size of the flock. The higher the mortality the more pullets needed for replacement.

3. Replacement costs — the cost of raising pullets and the sale value of adult birds — influence the number of pullets started. If the cost of raising pullets is relatively high and the price of poultry meat is low there would be a tendency to hold over a higher percentage of the layers for another year.

However, if the reverse is true a larger number of birds will be sold, resulting in more pullets to be raised.

How to Figure the Number of Hatching Eggs or Baby Chicks.—The percentage of pullets in any lot of baby chicks will be approximately 50 percent. Figuring hatchability at 60 percent, chick mortality about 20 percent (it should be below that figure) and about 5 to 10 percent for eliminating inferior pullets, it will take about 5 hatching eggs or $2\frac{1}{2}$ to 3 straight-run chicks to produce 1 good pullet.

Many poultrymen figure 40 good quality pullets from 100 straight-run baby chicks.

On the average 2,500 hatching eggs or from 1,250 to 1,500 straight-run baby chicks are needed for each 500 good ready-to-lay pullets.

Quick Method of Figuring.—Shrinkage (difference between number of birds at beginning and end of year) multiplied by $2\frac{1}{2}$ or 3 will give number of baby chicks needed to brood to keep flock at same level.

$\text{SHRINKAGE} \times 2\frac{1}{2} = \text{Number of chicks to start.}$

WHEN TO BUY

For Pullet Production.—Chicks purchased for pullet production are started in the brooder houses in the spring months — February, March and April. These pullets will be ready for fall egg production at 6 or 7 months of age, when the price of eggs is high.

Leghorns start to lay in 5 or 6 months. The general-purpose breeds — New Hampshires, Rhode Island Reds, Plymouth Rocks — start to lay in 6 or 7 months.

Some poultrymen hatch earlier in January to have late summer production. Others have found it desirable to start chicks 3 or 4 times a year to have a more uniform egg production.

Late hatched chicks (May or June) come into production late in the season when egg prices are dropping or declining.

For Broiler Production.—Broiler production in Florida has been a year-round business, with most of the chicks started in the late fall, winter and early spring months.

The type of broiler business and market conditions will determine to a large extent when chicks are purchased.

INCUBATION

Hatcheries are an important part of the poultry industry of Florida and the United States. About 84 percent of the chickens raised on farms in 1943 were purchased from commercial hatcheries as baby chicks. Practically all of the broiler chicks are produced by commercial hatcheries.

Ninety-six hatcheries in Florida with a capacity of 2½ million hatching eggs produced slightly more than 11 million (11,025,000) chicks in 1943.

The 2 methods of incubation are natural and artificial.

HATCHING CHICKS UNDER HENS

It takes 21 days for chicken eggs to hatch.

The general-purpose breeds, such as the Rhode Island Reds, New Hampshires, Plymouth Rocks and Wyandottes, make the best hens to incubate chicken eggs. The lighter weight breeds, such as the Leghorns, are unreliable sitters.

Preparing the Nest.—The nesting box should be about 16 inches square and 6 inches deep. Make the nest of soft hay, straw or leaves. Place the nest in a cool, quiet place, where the hen will not have to fly or jump into it and where it is protected from rain.

Shape the nest so that the entire setting (about 15 eggs) is in 1 layer with the center of the nest slightly lower than the outside to prevent the eggs from rolling out of the nest.

Setting the Hen.—Before setting the hen dust her thoroughly with sodium fluoride. It is usually best to place the eggs under the hen at night. The sitting hen should be healthy and free of external parasites.

Feeding and Care of the Sitting Hen.—Feed the hen on grains such as corn, wheat and oats. Keep grit and clean fresh water available at all times.

Examine the nests occasionally to see that no eggs are broken.

Check the hen for external parasites during the second week of incubation. Delouse again if necessary. Lice powders should not be applied just before hatching, as they might be harmful to the baby chicks.

HATCHING IN INCUBATORS

Hatching chicks in incubators has several advantages over hatching chicks under a broody hen.

1. The chicks can be hatched at any time of the year.
2. A larger number can be hatched at 1 time.
3. Less labor is necessary.
4. Incubation is absolutely necessary if breeder or flock owner plans to sell chicks.

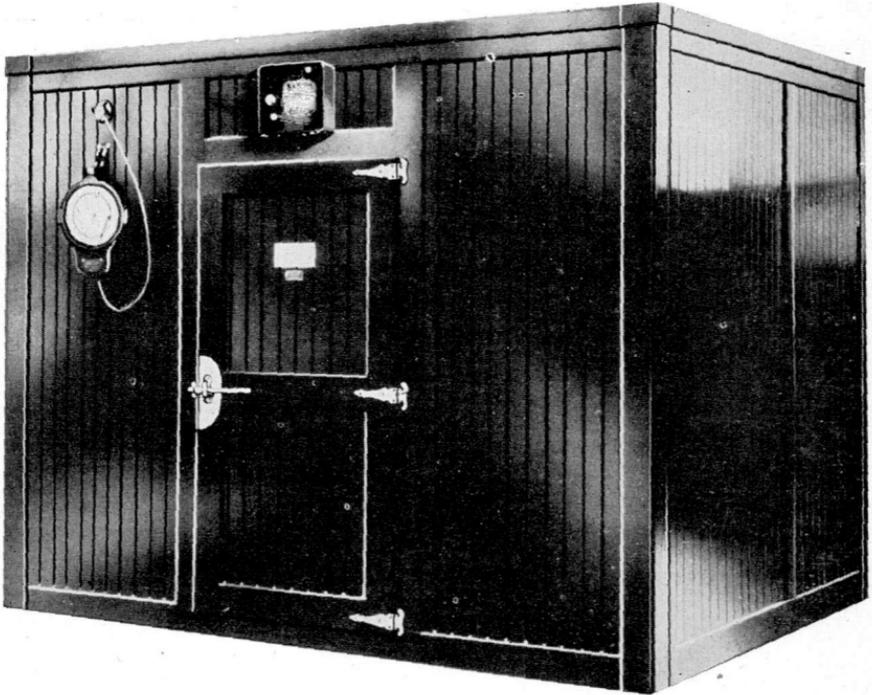


Fig. 3.—A cabinet type of incubator.
(Courtesy Smith Incubator Co.)

There are 4 factors involved in operating an incubator: Temperature, ventilation, egg position and moisture.

Temperature.—The temperature must be controlled within very narrow limits. The temperature to use will depend on the type of machine used. In the section-type incubators the temperature generally used is about 103° F., slightly lower than this at the start. In the cabinet-type incubators with forced draft the temperature is about 99.5 to 100° F.

CHECK CAREFULLY WITH INSTRUCTIONS FURNISHED BY MANUFACTURER.

Ventilation.—Proper ventilation is essential for good incubation to provide an adequate amount of oxygen for the growing

embryo. The room in which the incubator is located should be well ventilated. Follow manufacturers' directions for ventilating incubators.

Egg Position.—Egg trays are used in incubators. With the small type or section-type incubator the eggs are placed on their sides. In the cabinet-type machines the eggs are placed on end with the small end down. Turn the eggs 4 to 6 times daily. Discontinue turning the eggs after the 18th day. The cabinet-type machines have mechanical devices to turn eggs, while in the small section-type incubators the eggs are turned by hand. Roll the eggs gently so that the chick embryo will not be injured.

Moisture.—Humidity is necessary in proper incubation. A relative humidity of about 60 percent is required for good hatchability. The wet bulb reading would be about 85 degrees. The humidity during hatching time will be higher; about 88 to 90 degrees. It varies with temperature. If the humidity (moisture in the air) is too low, evaporation within the egg is too great and poor hatches result.

STUDY INSTRUCTIONS OF MANUFACTURER OF INCUBATOR. FOLLOW DIRECTIONS.

BROODING PRINCIPLES

The requirements for successful brooding are: Temperature control, constant supply of fresh air without draft, adequate space, sanitation, dryness, protection against chick enemies, safety from fire and proper feeding and management.

There are 2 methods of brooding chicks, natural and artificial.

Hen Brooding.—This method of brooding chicks is still practiced where only a few chicks are to be raised, either on the general farm or in town in the backyard. In most cases this is practiced if the hen is used to incubate the eggs.

A hen will brood from 12 to 15 chickens during the early season and will take care of a few more later in the season when it is warm.

A brood coop should be made so that the chicks may run in and out but should be closed at night to keep out rats and other animals. The coop should be constructed so as to provide plenty of fresh air and so that it may be easily cleaned and disinfected.

Confine the hen in the coop until the chicks are weaned. Move the coop to fresh ground about twice a week to prevent soil contamination and to provide green feed.

Artificial Brooding.—Artificial methods of brooding have made it possible to raise large numbers of chicks at 1 time. Very few farmers use the natural method if 100 or more chicks are raised. With artificial brooding chicks may be raised at any season of the year.

BROODER HOUSE SUGGESTIONS

Portable or permanent houses are used to brood baby chicks. Portable brooder houses are the most popular in Florida at this time.

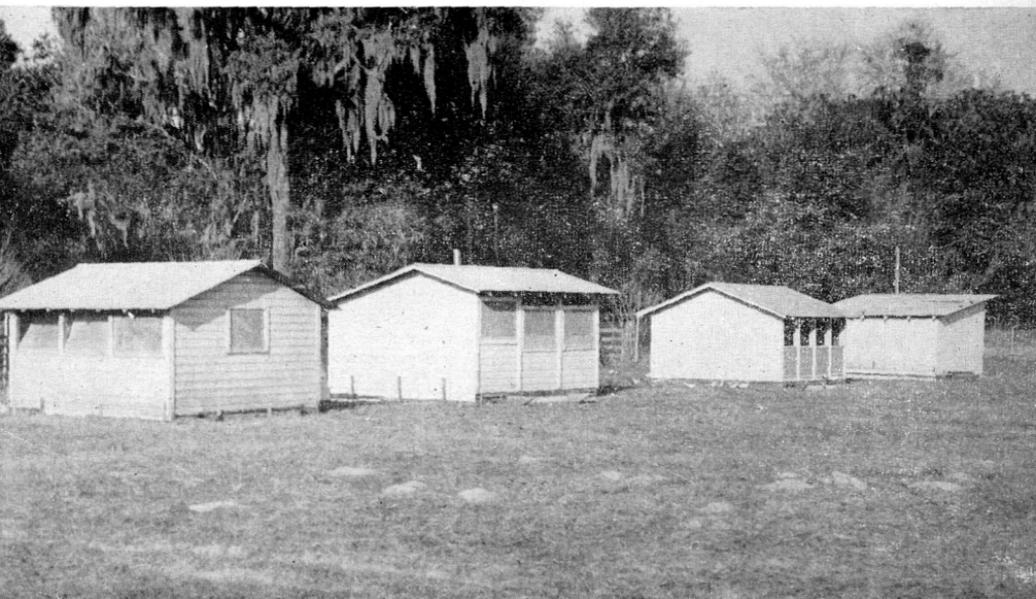
Land for brooder houses, including the yards and ranges, should be well drained. Proper air and water drainage is important.

Brooder houses should be well constructed. The portable brooder house is generally about 10' x 12', with either a shed, A-shaped or even-span roof. This type house is built on skids or runners so it may be moved to clean land. (Write for Circular 50 and Bulletin 126 giving suggestions on construction of brooder houses.)

A good brooder house provides comfort for the chicks. The floor should be tight, the roof waterproof, the side walls free from cracks. There should be ample ventilation without drafts.

Have the brooder house thoroughly cleaned before the chicks arrive. To clean a brooder house—sweep, scrub and spray.

Fig. 4.—Four different types of colony brooder houses.



The permanent brooder house may be a small unit, but generally it is a long house divided into small pens.

BROODING EQUIPMENT

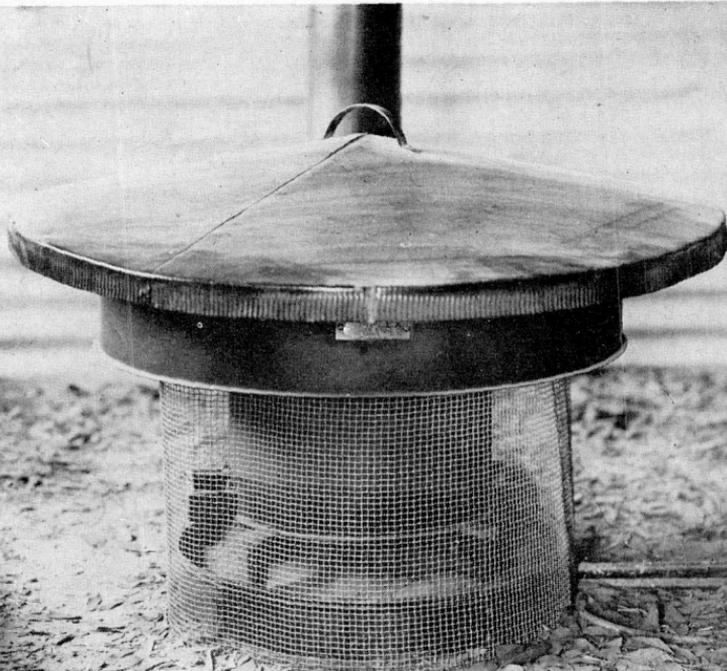
Brooder Stoves.—Many types of brooders are used to brood chicks artificially. They vary according to size, design and type of fuel used. The majority of the brooders are portable and are equipped either with or without a canopy. The canopy tends to concentrate the heat in a limited area near the source of supply.

Brooders vary in size from one small enough to take care of about 50 chicks to the continuous type brooder used to handle thousands of chicks.

Fuel.—Oil, electricity, wood, coal and gas are used as fuel. The first 3 are the more prevalent in this state.

Lamp Brooder.—This type is used extensively if a small number of chicks are to be brooded at one time. The heat is supplied by a kerosene lamp (bracket or wall type), see Fig. 6. For complete details write for Circular 70, "A Simple Farm Brooder and Finisher."

Fig. 5.—Drum-type oil-burning brooder stove.



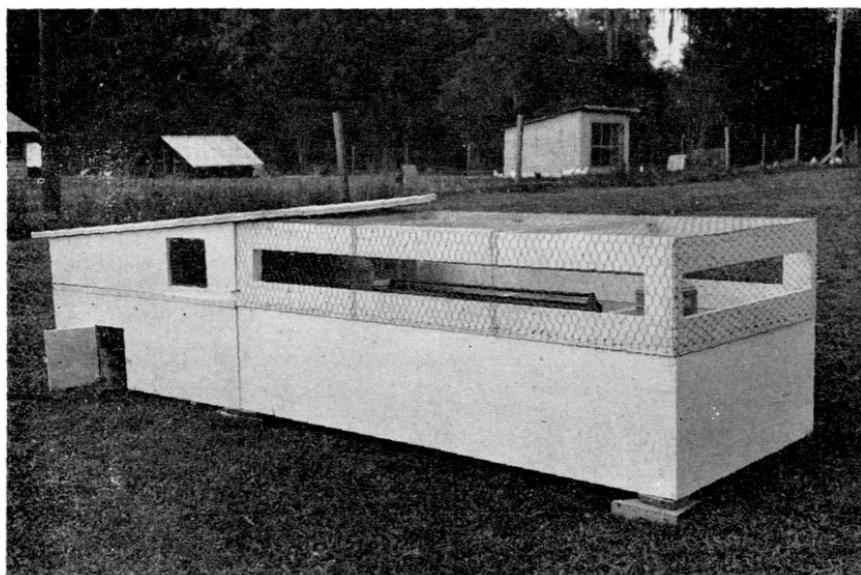


Fig. 6.—A complete farm brooder 3' x 10', including brooding and sunporch units. Note lamp, feeder and waterers.

Homemade Brooder.—The home-made brick brooder is found on many farms in Florida. Wood is used as fuel. For complete information on constructing a home-made brick brooder stove write for Bulletin 126, "Poultry Houses and Equipment." See Fig. 7.

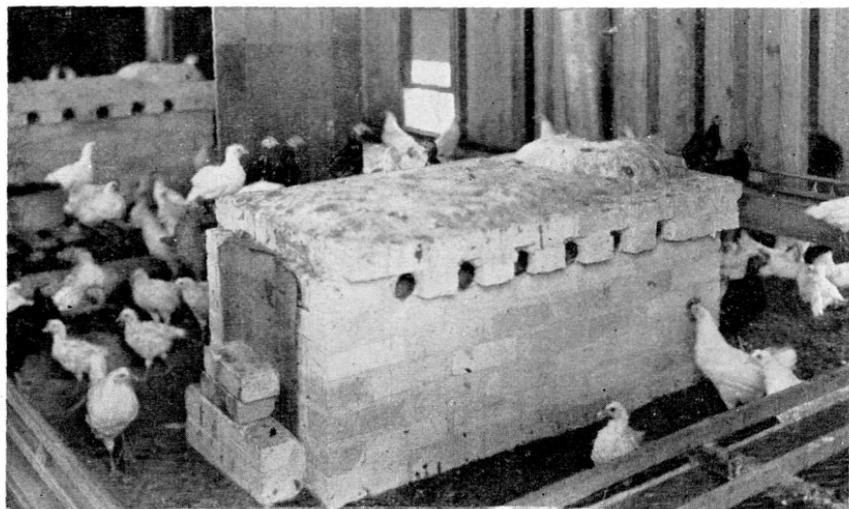


Fig. 7.—Home-made brick brooder stove, which is inexpensive, easily constructed and satisfactory.

Wood-burning Brooder.—Brooders that burn hardwood give satisfactory results. These brooders are thermostatically controlled, and are economical to operate, especially if wood is readily available on the farm. For best operation the chimney should be installed according to the manufacturer's directions and must be cleaned each week.

Oil-burning Brooder.—There are several types of oil-burning brooders on the market. One type which burns kerosene only in the wick is regulated by turning the wick up or down. Another type burner which uses kerosene or distillate has an asbestos or metal ring which acts as a vaporizer. The temperature in this type is regulated by a thermostat, which controls the flow of oil to the burner.

As a safety measure, use sand under the hover of oil brooders. Study and follow directions of manufacturer.

Electric Brooders.—Recently electric brooders have become available to brood baby chicks. The electric current must be dependable. Ventilation under electric hovers is most important to eliminate moisture as well as to provide fresh air for the chicks. Some models are provided with an electric fan. The brooders should be well ventilated and placed on a solid, tight floor.

Feeders.—Provide plenty of feeding space so all chicks can eat at one time. Runts, the result of improper rate of growth, are often caused by an insufficient amount of feeding space.

At the start or when chicks are placed in the brooder house, shallow pans, paper or cup flats used in packing eggs may be used for feeders.

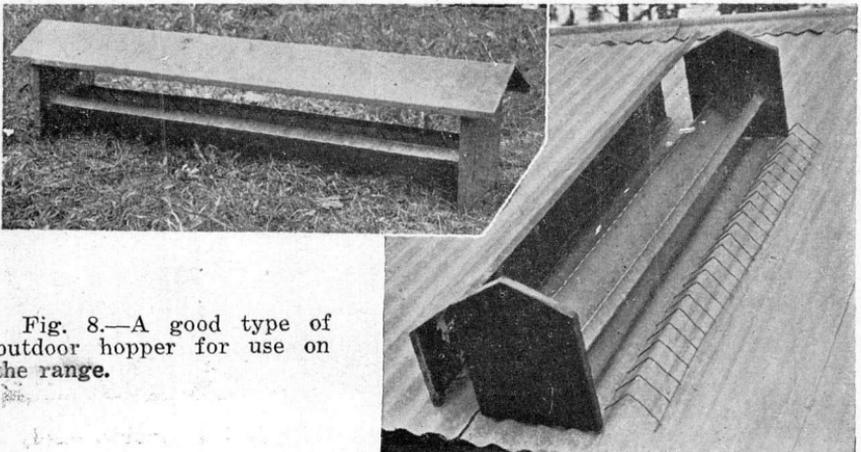


Fig. 8.—A good type of outdoor hopper for use on the range.

Small metal or wooden feeders should be used after the chicks are a few days old. These feeders should be non-wasting, easy for the chicks to reach, and keep out the chicks. Allow about 1 inch feeding space per chick at the start. As the chicks become older add more feeders, allowing about 2 to 3 inches per chick. Arrange the feeders so that both sides of the feeders are well lighted.

Waterers.—It is very important to have plenty of water fountains for chicks of all ages. For baby chicks 1-quart or $\frac{1}{2}$ -gallon containers are satisfactory. As the chicks become older 1-, 3-, 5-, or 8-gallon waterers are suitable. The 5- and 8-gallon waterers are used on the range for growing pullets.

All water containers should be easily cleaned.

Wire frames are used for water stands, and a cover helps to keep the water cool.

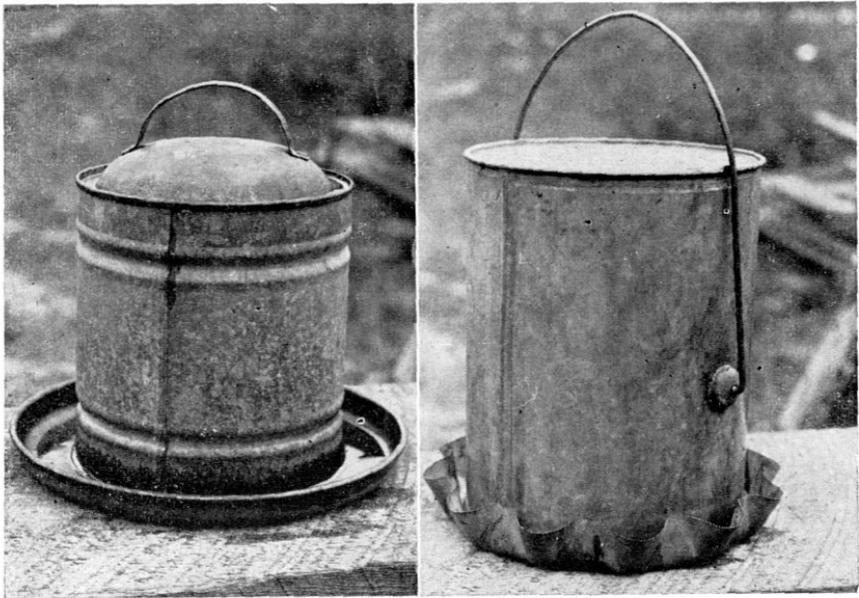


Fig. 9.—Two types of water vessels for growing birds.

Sun Porches.—Where available land for brooding chickens is limited and soil has become contaminated with disease organisms and the eggs of intestinal parasites, the use of wire-bottomed sun porches is suggested. The sun porch is attached to the brooder house. It is enclosed with wire, and is usually about $\frac{1}{2}$ the area of the brooder house floor.

Framework for the bottom is made of 1" x 4" boards set edge-wise and spaced about 2' apart. This is covered with wire ($\frac{3}{4}$ " to 1" hardware cloth). The floor of the sun porch is placed 10" to 20" inches above the ground so droppings can be removed by a scrape.

Wire Floor in the Brooder House.—Some brooder houses are equipped with wire floors. Frames are made of 1" x 4" boards placed on edge and are covered with $\frac{1}{2}$ " hardware cloth. The top edge of the framework should be beveled to prevent accumulation of droppings. The frames should be made small to facilitate handling.

BROODING PRACTICES

Is Brooder House Ready for the Chicks.—The brooder house, stove, feed and water containers should be thoroughly cleaned, disinfected and made ready for chicks several days before they arrive. The brooder stove should be started at least 48 hours before chicks are placed under the hover.

Operating the Stove.—By operating the stove for 2 days before the chicks arrive the operator has an opportunity to make the necessary adjustments without harming the chicks in any way. It also allows the house to warm up and dry out.

The temperature around the brooder edge should be between 90 and 100 degrees for the first week and should be lowered 5 degrees each week until no heat is needed. It is impossible to state definitely what ages the chicks must reach before the heat can be safely discontinued, as weather conditions, the development of the chick, and the time of year will influence the length of the brooding period. Follow the instructions prescribed by the manufacturer of your brooder.

The main thing about brooder house temperatures is to have them such that the chicks are comfortable at all times. Excess heat causes the chicks to pant or it may cause them to crowd into the corners of the house in an attempt to get away from the heat. If the temperature is too low the chicks huddle under the brooder hover, or in the corners of the brooder house. When chicks are comfortable at night they will spread out evenly under an electric hover, or form a circle around the edge of the hover of the oil- or wood-burning stove. Use a thermometer as a guide, but the behavior of the chicks will determine whether temperature conditions are right.

Litter.—The use of a highly absorbent litter on the brooder house floor is desirable. The litter should be kept dry at all

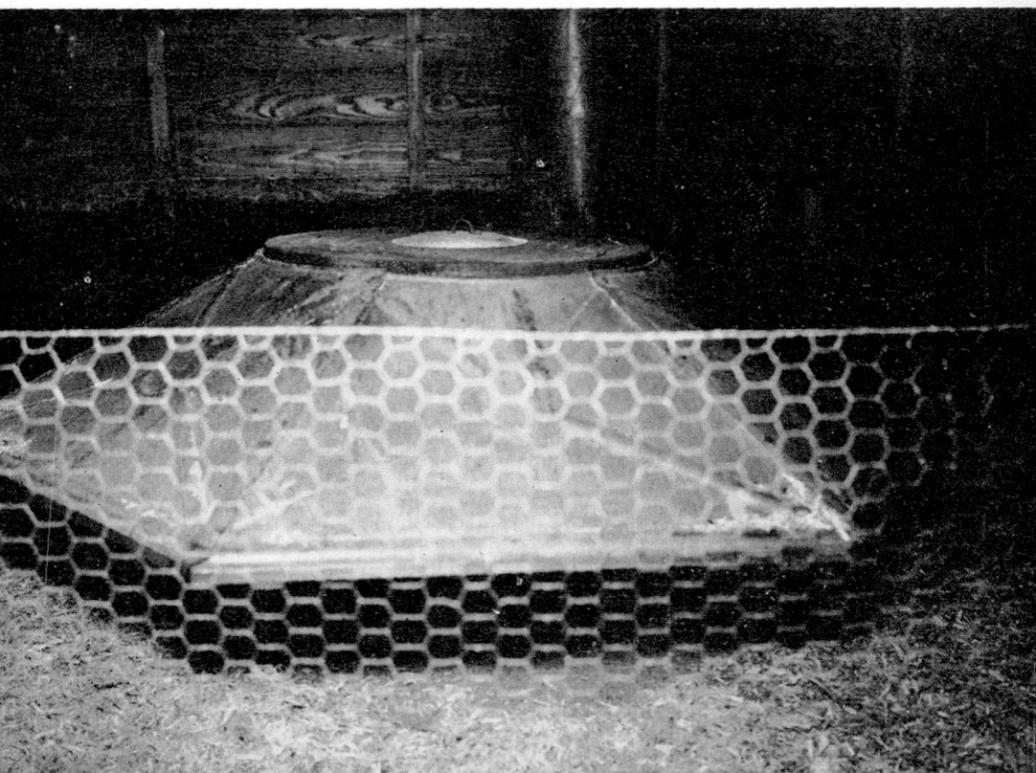
times. Some poultrymen use a thin layer of litter and remove it each week, while others use a deep, or built up, litter system (i.e. new litter is added each week) for the entire brooding period.

Planer shavings, sawdust, fine cut straw, sugar cane pulp and peat moss have been used successfully for litter in Florida. The litter must be clean and free from mold and mustiness.

Ring Around Hover.—When chicks are first placed in the brooder house they should be confined to a small area around the brooder for the first 2 or 3 days until they learn that the hover furnishes heat. A wire ring of poultry netting 12 to 18 inches high and about 1½ to 2 feet from the edge of the hover will prevent the chicks from wandering away from the heat. Care must be taken to see that the hover area does not get too hot while the chicks are confined in this manner. As chicks become older the ring can be enlarged until it serves only to round out the corners of the house.

As soon as the chicks learn to find the source of heat they should be taught to find their way in and out of the house. The earlier this is done the better, for delay simply increases the difficulty of teaching them. If weather conditions permit,

Fig. 10.—A wire ring around the hover helps teach the chicks the source of heat.



the chicks should start using small yards about the house by the time they are 10 days old. They may be encouraged to go into the yard by placing a feed and water container in the yard near the door. When chicks first start using the yards it may be necessary to drive them back into the house for the first few days.

Feeding.—In the feeding of chicks it is very important to see that they secure the right kind of feed and that it is fed properly.

To make a chick grow off well, a balanced ration should be fed. A balanced ration contains protein, carbohydrates, fats, minerals and vitamins, all of which are mixed in the correct proportion.

Poultry rations may be either all-mash or mash and grain fed separately. There are many feed formulas available and apparently many satisfactory methods of feeding chicks. The main consideration is the use of a balanced ration in a satisfactory feeding plan.

In chick rations the protein is generally obtained from milk and meat scraps, used for growth and development; the minerals are supplied by bone meal, calcium carbonate (lime), and salt for bone development; and the carbohydrates and fat are supplied by the cereals and their by-products. The vitamins are supplied in these ingredients and green material.

There are a number of well balanced commercial feeds obtainable and generally used by poultrymen. Other poultrymen prefer to mix their own feeds. When only a few chicks are raised it is less trouble to use a commercial feed. (See Bulletin 118, *Wartime Feeding of Chickens.*)

Chicks are ready for feed and water just as soon as they are put in the brooder. Chicks may be fed as soon as they are fluffed out without influencing either rate of growth or mortality.

Small mash hoppers are desirable for early chick feeding, or the chicks may be fed first on newspapers, boxlids or pie plates.

Mash feed is recommended for baby chicks for at least the first 2 or 3 weeks. Chicks need a high protein ration at the start (mash feed) and as they become older the protein level should be reduced. This is usually done by increasing the amount of grain fed.

When chicks do not have access to direct rays of the sun or cannot get sufficient green feed frequently they show early signs of leg weakness. Add a tested brand of cod-liver oil (1 to

2 pints to 100 pounds of feed, or the amount as recommended on the container) to the mash or D-activated animal sterol. (See Bulletin 118.) Mix only a small quantity at a time.

When chicks are about 3 weeks old scratch feed can be added to their ration. This may be composed of equal parts of fine cracked corn and wheat. Only a small percentage of scratch is used at first, this amount being increased slowly until equal parts of mash and scratch are fed when the chicks are 10 weeks of age.

Prevent Crowding.—Too many chicks in a house or yard is not the only cause of overcrowding. Fright, chilling and overheating will cause chicks to become crowded, regardless of the amount of floor space used. Unless adequate feed hopper space is provided chicks will be crowded around the feeders and the weak ones will be pushed away. Crowded conditions from any cause usually result in a slower rate of growth and high mortality (Table 4).

TABLE 4.—RELATION BETWEEN FLOOR SPACE AND MORTALITY OF CHICKS.*

Floor Space for 100 Chicks	Number of Chicks	Number of Deaths	Percent Mortality to 3 Months of Age
35 sq. feet or less	73,077	19,257	26.3
35 - 50 sq. feet	25,371	4,122	16.2
50 sq. feet or more.....	25,044	3,484	13.9

* Cal. Agr. Ext. Cir. 28, Brooding and Pullet Management, W. E. Newlon and M. W. Buster.

Teach Chicks to Roost Early.—Provide perches made of 1" x 2" strips with wire on the under sides when chicks are 3 to 4 weeks old. Raise the perches as the chicks get older. This will prevent crowding and give a better circulation of air. (See Bulletin 126, Poultry Houses and Equipment.)

Milk Products.—In figuring quantities of different types of milk products to use, the following will serve as a guide: 1 pound of skimmilk powder equals about 3.3 pounds of semi-solid or condensed milk or 1¼ gallons of fresh skimmilk.

BATTERY BROODERS

Battery brooders consist of brooding compartments one above the other, either 3, 4 or 5 decks high, with wire floors and metal pans for collecting the droppings. Each compartment is generally provided with a heating unit. Feed and water troughs are arranged around the outside of each compartment.

There are 2 types of batteries used. The warm room brooder, which is a battery without a heated compartment, and the battery equipped with a heating system for each compartment.

Batteries are generally heated with electricity, but gas, oil and hot water are sometimes used. Some batteries have a separate heating compartment at one end, while others have a heating compartment in the center. Batteries with contact heaters also are available.

Battery brooders are used by hatcheries to hold surplus chicks until they can be sold, and by broiler producers to brood their chicks. Batteries are very seldom used by commercial egg producers for brooding and rearing pullets.

Broilers are being raised in batteries successfully, but in most cases the broilers are marketed locally. Shipping battery-raised broilers any great distance results in rather excessive shrinkage in weight.

In commercial broiler plants where battery brooding is done successfully it is necessary to have complete control over temperature, ventilation and humidity. When large numbers of chicks are housed in 1 room plenty of air is needed, and a fan-controlled ventilation system is indispensable.

BATTERY HOUSE

The battery house or room should be well constructed with the walls and ceiling insulated and with a concrete floor which slopes at least 1 inch in 10 feet to permit water to flow freely into the drain. The ceiling should be at least 2 feet above the top of the battery, preferably more. Fans to control ventilation should be located in the ceiling or walls. The fans should not blow air directly on the chicks. During hot weather it may be necessary for the fan to pull air through a wet excelsior pad, or to keep the floors damp to maintain a relative humidity of not less than 65% and to hold the battery room temperature down to 80° F. or below. Outlets in the side wall or in the floor should be so arranged as to aid the fan in keeping an adequate distribution of air. Heaters are necessary in cool weather to maintain a temperature between 60° and 80° F.

The size of the battery room will be determined by the number of chicks to be brooded and the number and size of the batteries to be used. It is advisable to select your batteries first and then build a house to fit the batteries. Batteries should be so placed as to allow plenty of room for the attendant to work between them.

MANAGEMENT OF BATTERY BROODING

Placing too many chicks in each battery unit is a common mistake made by beginners in the battery brooding business.



Fig. 11.—Battery brooder, unheated type.

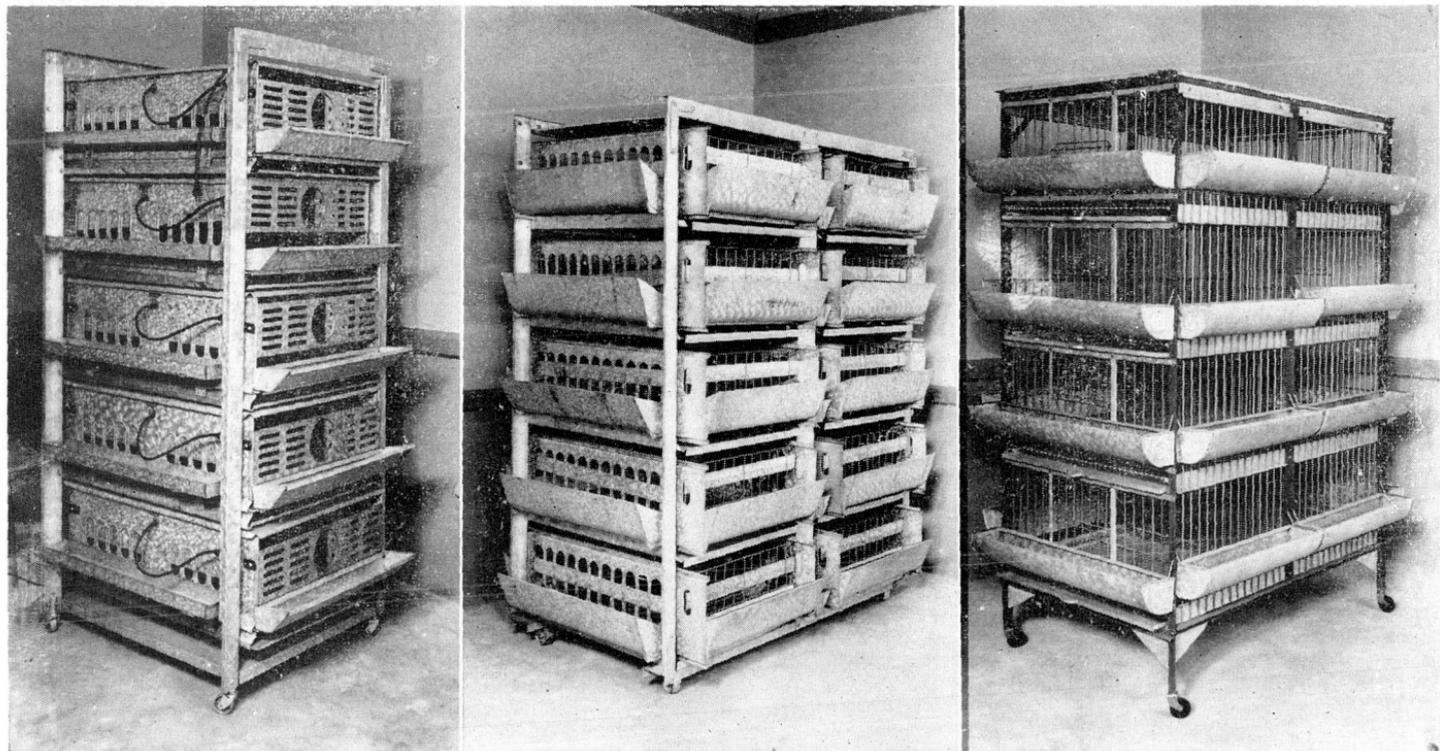


Fig. 12.—Types of starter, grower and finishing batteries.

Crowded conditions in the battery tend to increase brooding troubles and disease hazards and greatly retard growth.

The relative humidity of the battery room should be so regulated as to be maintained at not less than 65 percent. Most operators prefer a room temperature between 70° and 80° F., with the temperature in the heated compartment of the battery about the same as under other type brooders (i.e. 95° F. for the first week or 10 days, and reduced 5° each week until no heat is needed).

The requirement for battery space and air supply is given in Table 5.

TABLE 5.—SPACE AND AIR REQUIREMENTS OF CHICKS IN BATTERY ROOMS AND BATTERIES.¹

Age of Chicks	Estimates — Battery Floor ²		Estimated Number of Cubic Feet of Air Required Each Minute by 100 Birds ⁴
	Floor Space per 100 Chicks ³	Chicks per 100 Square Feet of Floor Space ³	
weeks	sq. ft.	number	cu. ft.
1	6.25	1,600	1.6
2-3	12.50	800	2.0
4-5	17.36	576	2.5
6-7	25.00	400	3.0
8-9	31.25	320	3.5
10-11	41.67	240	4.0
12	52.08	192 ⁵

¹ Brooding and Rearing Chicks. Cal. Agr. Ext. Cir. 127, 1943. Newlon, W. E., and D. S. Asmundson.

² The battery room floor space required is approximately the same as the battery floor space requirements given for installations of several batteries. The floor space required will, of course, vary with the number of tiers in the battery.

³ Based on data given by: Lee, C. E. Profitable chick battery and laying cage management. 4th ed. 82 p. The Beacon Milling Company, Inc., Cayuga, N. Y. 1939.

⁴ This is the minimum below which condensations of moisture would occur. The air requirements given in this column were calculated by Professor R. L. Perry (University of California, Division of Agricultural Engineering, Davis) and were based on air entering with a 60° dew point absorbing 0.007 pound of vapor per pound of air.

⁵ Data not available.

Daily removal of droppings is recommended. Batteries should be thoroughly cleaned and disinfected after each brood. In case of an outbreak of disease, depopulation, thorough cleaning and disinfecting of batteries and room are recommended before starting another brood.

FATTENING OR FINISHING COCKERELS

Young cockerels that are to be sold for meat purposes should be well fattened. If they are fat and well fleshed when taken from the brooder or range houses additional fattening may be

unnecessary. However, if the birds are thin they should be placed in the fattening pen and finished before they are marketed.

When birds that are to be fattened are placed in the finishing pens great care should be taken not to over feed. They should have a keen appetite and be given increasing amounts of feed as they grow and fatten.

Usually from 7 to 16 days are considered the length of the fattening period. The condition of the birds when placed in the pens will influence the length of time.

A mixture of 2 parts of corn meal, 1 part of rolled oats and 1 part of middlings, with sufficient skim milk to make the mixture pour freely, has been used with good results.

Other mixtures suggested are 6 parts of corn meal, 3 parts rolled oats and 1 part of middlings, or 6 parts of corn meal, 2 parts of ground oats and 2 parts of middlings. Skim milk is added as suggested in the first ration.

GROWING PULLETS ON RANGE

Pullets which are to be reared as potential egg producers should be moved to clean, well-sodded range. This moving is generally done when the cockerels and pullets are separated.

Fig. 13.—Summer shelters or range houses on bermuda sod.



These growing pullets will be housed in summer range shelters (see Fig. 13 and Bulletin 126). Do not crowd.

SUMMER RANGES AND SHELTERS

When the cockerels are marketed, cull the slow, runty pullets and all the birds that are not likely to develop into profitable layers. Place the remaining pullets on a range that is clean and with a moderate amount of shade and a good supply of green feed.

Provide a suitable light movable summer shelter. These shelters are 8' x 10', 10' x 10' or 10' x 12', with wire on all sides. In most cases they have a wooden floor.

A roosting frame is provided for each house. There is wire under the perches to keep the birds out of the droppings.

KEEP YOUNG CHICKS AND GROWING BIRDS AWAY FROM OLD BIRDS.

In feeding the growing pullets, grain is generally fed when they are about 8 weeks of age. Feed grain in hoppers.

The water vessels on range should be covered so as to keep the chickens out and at the same time keep the water cooler.

Allow about 12' of hopper space and 3' drinking space for each 100 pullets (or use 1 5- or 8-gallon waterer for each range shelter).

The growing pullets should be in good flesh. As they mature they should have a sufficient amount of fat on their bodies to enable them to withstand the strain of egg production.

Fig. 14.—Portable brooder, rearing or laying houses on a well sodded range.



It may be necessary to increase the amount of grain or a fattening mash may have to be fed in addition to the regular feed if the pullets are developing too rapidly.



Fig. 15.—Cool and comfortable pullet range. Note summer shelters, shade, outside hoppers, covered water vessel, and method of conveying water barrels to range.

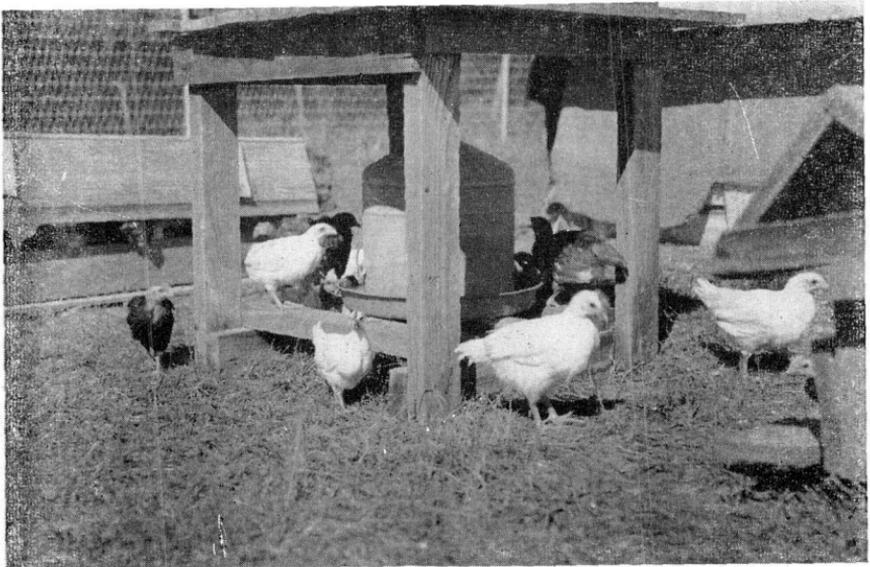


Fig. 16.—Double wall fountain on wire platform with cover, used on range for pullets.

Too much protein in the feed will have a tendency to bring the pullets into production too early.

GROWTH STANDARDS AND FEED CONSUMPTION

The rate of growth of chickens varies considerably. Feed, management, environmental conditions and breeds are factors that may influence weight changes in chickens.

The data given in Tables 6 and 7 may be used as a guide in studying weight of birds at different ages and gain made at bi-weekly intervals, together with bi-weekly feed and cumulative feed consumption.

TABLE 6.—APPROXIMATE AVERAGE WEIGHT PER CHICK IN POUNDS, BY 2-WEEK PERIODS.*

Age in Weeks	S. C. White Leghorns		Dual-Purpose Breeds	
	Cockerels	Pullets	Cockerels	Pullets
0	.09	.09	.09	.09
2	.22	.19	.22	.19
4	.48	.39	.51	.46
6	.84	.69	1.07	.87
8	1.33	1.14	1.71	1.37
10	1.93	1.47	2.20	1.70
12	2.34	1.74	2.84	2.22
14	2.76	2.08	3.58	2.64
16	3.16	2.41	4.07	3.08
18	3.50	2.72	4.68	3.51
20	3.87	3.02	5.17	3.86
22	3.98	3.26	5.64	4.20
24	4.40	3.47	5.89	4.52

* Compiled from various sources.

TABLE 7.—AVERAGE BI-WEEKLY FEED CONSUMPTION PER CHICK, IN POUNDS.*

Age in Weeks	S. C. White Leghorns Cockerels and Pullets		Dual-Purpose Breeds Cockerels and Pullets	
	Bi-Weekly	Cumulative	Bi-Weekly	Cumulative
0-2	.37	.37	.29	.29
3-4	.72	1.09	.70	.99
5-6	1.15	2.24	1.36	2.35
7-8	1.62	3.86	1.90	4.25
9-10	2.01	5.87	2.45	6.70
11-12	1.97	7.84	2.63	9.33
	Pullets		Pullets	
13-14	2.18	10.02	2.67	12.00
15-16	2.29	12.31	2.67	14.67
17-18	2.33	14.64	2.81	17.48
19-20	2.13	16.77	2.60	20.08
21-22	2.43	19.20	2.88	22.96
23-24	2.51	21.71	3.02	25.98

* Compiled from various sources.

Culling During Growing Period.—Cull for signs of weakness or lack of vigor. If young chicks look dumpy and tend to huddle in corners it is a sign that the chicks are chilled or sick. Droopy feathers indicate disease. Cull chickens that are sick and those lacking in vigor as soon as they are observed. Go over the flock once a month to remove the unthrifty birds.

Poorly developed birds in flocks of growing chickens may be due to low quality of breeding stock, faulty diets or improper management.

Culling during the growing period saves feed, tends to prevent spread of disease and results in a more uniform flock.

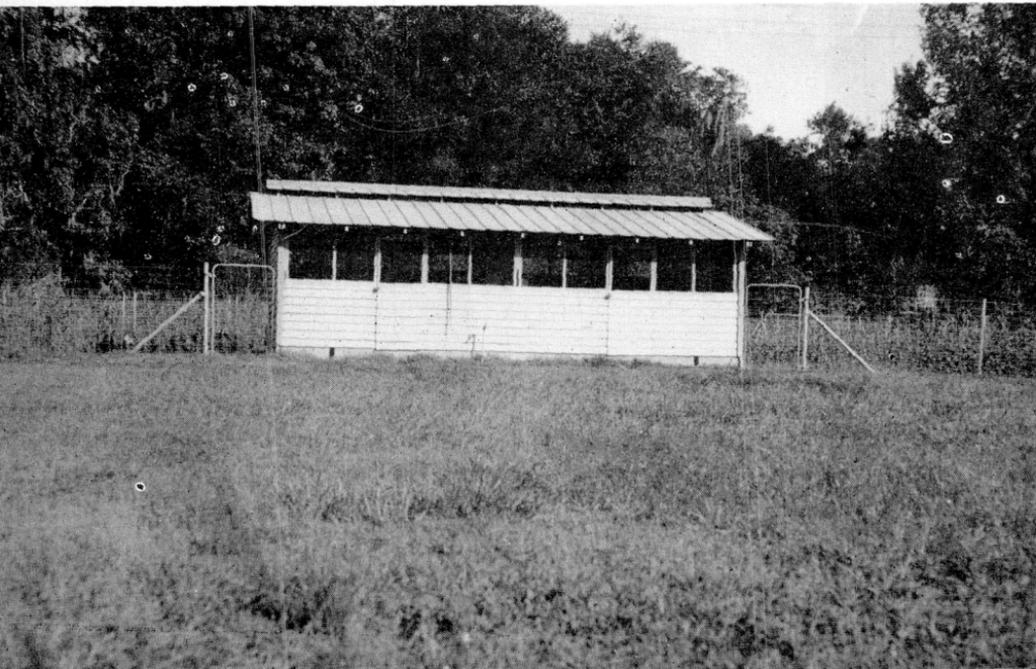
Cull for poor feathering, especially in broilers.

Cull for poor body shape and fleshing. Good fleshing on breast and thighs is particularly important from the standpoint of efficiency of meat production.

The degree of fleshing is influenced by the stock, kind of diet, amount of feed and methods of management. Overcrowding, internal parasites and disease retard growth and prevent proper fleshing.

Cull Pullets at Housing Time.—To produce well, pullets must possess plenty of vigor. Bright prominent eyes, a short beak on a broad head, bright yellow shanks, lustrous plumage and good fleshing are points to consider in selecting pullets for the laying house.

Fig. 17.—A suitable type laying house, with good grass range, for pullets.



HOUSING PULLETS IN LAYING HOUSES

The pullets on the range should be moved to their permanent laying quarters about 2 or 3 weeks before they come into production. Moving them after they are in production may result in a setback, a partial molt and a cessation of egg production.

The laying houses should be thoroughly cleaned and disinfected before the new crop of pullets is placed in them.

BROILER PRODUCTION

The commercial raising of broilers has become an important phase of the poultry business.

Commercial broilers may be raised in 3 different ways:

1. In batteries from start to finish.
2. In batteries at the start and finished on the floor.
3. On the floor throughout the entire period.

In general, broiler production has been developed into 2 general plans.

1. A certain number each week.
2. A certain number of lots per year.

In the first case the broiler producer has chicks from day-old to market age, while in the second case the chicks are all of 1 age. These broiler producers handle 2, 3 or 4 lots a year.

Breeds.—New Hampshires, Rocks and cross-breds (Red-Rock or N. H.-Rock cross) are generally used. In Florida at present the New Hampshire is the popular broiler chick.

The kind of chicks used for broiler production depends upon the location of the area.

Feeding Broilers.—Broilers are generally started on all-mash chick starter containing about 20% protein. Some use regular broiler mash. Dry mash and water are kept before the birds at all times. Some supplement dry mash with grain feeding. Table 8 gives data on pounds of feed required per pound of live weight.

Factors Influencing Profits.—According to data from Maryland, factors influencing profits are gross income and costs, efficiency in use of feed, efficiency in use of labor, marketing cost, efficiency in use of fuel, cost of baby chicks, capital investment, size of enterprise, number of lots per year, weight of

birds at time of sale, overcrowding, mortality, breeds, feeding practices and marketing practices.

TABLE 8.—POUNDS OF FEED REQUIRED PER POUND OF LIVE WEIGHT.*

Weeks	White Leghorns			General-Purpose Breeds		
	Average Weight per Bird	Average Feed Consumed per Bird	Pounds of Feed per Pound of Weight	Average Weight per Bird	Average Feed Consumed per Bird	Pounds of Feed per Pound of Weight
	pounds	pounds	pounds	pounds	pounds	pounds
4	0.44	1.25	2.84	0.53	1.26	2.38
8	1.20	3.80	3.17	1.67	4.79	2.87
12	2.03	7.56	3.73	2.64	8.79	3.33
16	2.78	12.37	4.45	3.62	13.62	3.76
20	3.50	17.82	5.09	4.66	20.36	4.37
24	4.12	23.56	5.72	5.57	28.48	5.11

* This Table is based on Jull's Successful Poultry Management, McGraw-Hill.

Percentage Distribution of Costs.—The cost of producing broilers varies from farm to farm during the same year and from year to year. Also the percentage that each item is to the total cost varies from farm to farm. Studies made in several broiler producing areas show that feed represents about 50 to 60 percent of the total cost, chicks 18 to 23 percent, and labor 7 to 12 percent. The remaining percentage would include fuel, use of buildings, land, equipment, interest, taxes, etc.

Feed and chicks are the most important 2 items of expense in producing broilers.

SANITATION AND DISEASE CONTROL PROGRAM ¹

Prevent Losses.—Disease, of one kind or another, causes some loss in almost every flock. Poultry raisers must do everything possible to prevent the spread of disease.

Some of the ways by which parasites and diseases spread are listed as follows:

1. Eggs of parasites and disease organisms are carried from place to place on the shoes and clothing of the person attending the flock and by visitors.

¹ Authors are indebted to Dr. M. W. Emmel, Veterinarian, Florida Agricultural Experiment Station, for his suggestions and comments on the section dealing with disease prevention and diseases.

2. Feed pails, sacks, catching coops and shipping crates are often the means of spreading disease.
3. Rats, wild birds, insects and particularly flies and mosquitoes carry disease organisms from place to place.
4. Contaminated water and dirty feed troughs and hoppers are often responsible for spreading disease.
5. Careless disposal of manure, litter and dead birds and undue accumulations of manure in houses may be the cause of a serious outbreak of disease.
6. Unbalanced diets may give rise to certain nutritional diseases or may weaken the birds so that they are unable to resist the attacks of organisms of other diseases.
7. Raising chickens on contaminated land.
8. Improperly cleaned and disinfected brooder houses.
9. Overcrowding, protection from sudden changes in temperature, drafts and other unsatisfactory conditions may be contributing factors.
10. Old birds and young birds allowed to run together.

The prevention of diseases and parasites is more effective than trying to cure diseases after they develop and this is important from our economic standpoint.

WRITE VETERINARY DIVISION for information on diseases and parasites.

Reduce Losses During Growing Period.—Two essentials in chick raising are good stock and good management.

Good stock includes hatching eggs or chicks from well-bred breeders free of pullorum disease. Good stock means fast feathering, rapid growth, high egg production, good egg size, and livability.

Good management includes proper care of the stock, maintaining a reasonable degree of sanitation in the brooder houses, range shelters and batteries, well-balanced feed properly fed and regularity in all details. Be on the alert at all times.

DISINFECTANTS AND ANTISEPTICS

A disinfectant is a substance which is capable of killing microorganisms. In disinfecting poultry houses, these points should be kept in mind: (1) Use correct strength, (2) the places to be disinfected should be clean, (3) preferably applied with a spray pump, and (4) since most disinfectants are very irritating, the operator should protect the exposed parts of his body.

Disinfectants should be thoroughly applied to the interior of the houses and worked into cracks and crevices. All equipment as well should be cleaned and disinfected.

Some of the more common disinfectants suggested are:

1. Coal-tar disinfectants with a phenol coefficient 5 or above which includes creolin, cresol, liquor cresolis compositus, and others. A 2 percent solution is used for general purposes (5½ tablespoonfuls in 1 gallon of clean water).

2. Lye. One can of household lye dissolved in 5 gallons of hot water applied to the ceilings, walls and floors of the poultry house destroys coccidia and other parasite eggs. An old broom can be used to apply the lye solution; care should be taken to prevent the fluid from coming in contact with the hands and face. About 1 hour after the lye solution is applied the house should be rinsed with hot water.

Antiseptics that may be used to help prevent the spread of infection through the drinking water are:

1. Bichloride of mercury (6 to 7 grains—1 tablet in 1 gallon of water). Do not use metal containers.

2. Hypochlorite solution and other chlorine compounds. Use as directed on containers.

CHICKEN POX

Chicken pox is an infectious disease of fowl which is characterized by reddish-gray nodules covered with crust-like scabs on the unfeathered portions of the body and sometimes by cheesy-like deposits in the mouth and upper respiratory passages. In this climate the disease itself seldom causes death of the bird but secondary complications bring about death in many cases.

Vaccination as a preventive measure is quite successful. Two methods, the stick or stab method and the follicle method, are used. The most opportune time for vaccination is as soon after 6 weeks of age as possible, or when the pullets usually are separated from the cockerels.

The location to apply the vaccine by the follicle method is on the leg about 2 inches above the hock joint. Pluck about 6 or 8 feathers and apply the vaccine with a small stiff brush by dipping it in the vaccine and rubbing it over the defeathered part. Always follow the directions given with the vaccine.

When the stick method is used the vaccine may be applied to either the web of the wing or the triangular unfeathered area

high up on the leg where the feathers of the leg, breast and back meet. A sharp instrument is dipped into the vaccine and the area is stuck.

In 6 to 8 days the reaction of the vaccine appears in the form of a scab at the point of vaccination. When properly performed, the immunity established should last during the life of the bird. Birds should be examined 10 days after vaccination to note the number of "takes", which are determined by the presence of a well-formed scab at the site of each vaccination.

Pigeon pox vaccine may be used on flocks in which the disease is occurring. The use of pigeon pox vaccine on a laying flock does not result in a severe reduction in egg production. Pigeon pox vaccine, however, does not result in as lasting immunity as in cases in which fowl pox vaccine is used.

CANNIBALISM

Cannibalism is a vice frequently observed in poultry, wherein birds are attacked by their pen mates, resulting in injury or death. It may be manifested in various forms, including feather pulling and toe picking, as well as head, wing, tail and vent picking. These various forms occur in all breeds of fowl, but the light breeds of chickens are more susceptible to these vices than the heavier breeds. Chickens of all ages are subject to these vices. These vices are usually started in flocks that are overcrowded or when birds are confined in restricted areas with insufficient exercise. Nutritional deficiencies and heavy infestations of worms may be responsible.

The various forms of cannibalism may be prevented in most instances by proper feed and management. Painting the windows red, using red curtains, using a ruby colored light bulb have successfully prevented cannibalism.

Another effective method of stopping feather picking and cannibalism is to increase the salt content of the diet for 2 or 3 days. When an all-mash ration is being used, add 2 percent salt to the mash, but if equal parts of mash and grain are being fed 4 percent salt should be added to the mash. The salt treatment usually stops cannibalism within a few hours, but in some cases 2 or 3 days are required.

If the salt treatment fails to stop cannibalism within 3 days it may be necessary to trim back to the quick the upper mandible of the beak of each chicken.

COCCIDIOSIS

Coccidiosis is one of the most important diseases of young, growing chickens. This disease occurs most frequently in chickens from 4 to 12 weeks of age; however, younger or older birds sometimes become infected. Extensive losses may occur from such outbreaks.

Chickens affected with coccidiosis become weak and droopy. Their feathers become ruffled and they present a "peaked" appearance. The wings often slightly drop to the side. Poor feathering or other nutritional deficiencies may at times be an indication of coccidiosis. The birds may appear sleepy. Diarrhea may be present. Bloody droppings are an indication of the cecal (blind pouch) type of coccidiosis. Other types of coccidiosis rarely produce bloody droppings but quite often the droppings are streaked with blood. Lameness is often associated with coccidiosis.

Whenever an outbreak of coccidiosis occurs in young birds it increases in severity daily and even though but few birds are lost in the early stages the death rate will rapidly become very high unless treatment is administered immediately.

To control coccidiosis all birds should receive a ration consisting of 40 percent dried skim milk or buttermilk—40 pounds of dried milk added to 60 pounds of the regular mash. Dried whey may be used but should make up only 25 percent of the ration, as it contains a higher percent of milk sugar. Dried whey is particularly recommended for the treatment of laying birds. In severe outbreaks recovery is hastened by feeding the dried milk flushing mash for 2 or 3 days, after a short period of starvation. The grain ration should be discontinued for the time being so as to force the birds to eat as much of the milk mixture as possible. This treatment is sometimes called "flushing," as a water diarrhea usually results. The treatment can be repeated after an interval of 4 to 6 days if necessary.

Rigid sanitation should be practiced. Most common disinfectants will not kill the coccidia in dilutions practical to use for disinfection. The houses should be thoroughly cleaned mechanically and the droppings removed at least every third day. The ground should be cleaned of all trash and refuse that may have collected. Care should be taken that the soil around drinking vessels and in low areas does not become damp, as such soil furnishes an excellent place for the sporulation of coccidia.