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# POULTRY MANAGEMENT

(For 4-H Poultry Projects)



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# POULTRY MANAGEMENT

(For 4-H Club Projects)

This circular was prepared especially for 4-H members enrolled in a poultry project. However, many of the practices recommended can be applied to any farm poultry operation.

Your success will depend largely on how closely you follow the suggestions of your poultry project leader and those given here.

The 4-H poultry projects are set up for you to enjoy. At the same time, you can earn some money and learn how to be a successful poultry raiser.

Choose one of the following for your

project: Young Stock Production, Broiler Production, Flock Management, or Quality Egg Marketing. The project you select will depend on your interest, experience, ability, investment needed, and equipment available. Before deciding, talk it over with your parents and project leader.

There are excellent opportunities for poultry project members with good records to take part in poultry judging contests and demonstrations. And they may make application for other 4-H awards.

## POULTRY'S PLACE IN THE FARM BUSINESS

Poultry raising should have its proper place in the farm business. A thorough study and analysis of the entire farm operation is necessary in making such a determination. The size of farm, proper use of the land, market outlets, other enterprises on the farm, likes and dislikes of the farm family, and available labor are some of the factors to consider in deciding how poultry can best fit into their farm operation.

The farm flock should either be large enough to make a profit, or just

the size required to supply eggs and poultry for family use. From 300 to 400 hens and pullets are recommended as the smallest flock from which to sell market eggs for profit. A 25 to 50-hen flock will furnish all the eggs and poultry needed for home use, with few or no products for market.

Flocks between these two sizes are rarely fully appreciated as a source of income and do not receive the attention necessary to make them profitable. Surplus eggs, above family

needs, particularly during the summer months, do not receive the necessary care to preserve their quality. And eggs of poor quality discourage housewives from buying.

Also, equipment such as laying houses, brooder houses, summer range shelters and brooder stoves cost more for each hen kept. Cost of this equipment remains about the same whether used to full capacity, or for only a small number. Often owners of these "in-between-sized" flocks do not have this equipment and do a much less efficient job of raising pullets and managing their laying flocks.

Lower priced eggs, higher death losses, poor production and other costs under these conditions often cause the flock to lose money which must be made up from other sources of income on the farm.

Poultry raising can no longer succeed by hit and miss methods. It has become a specialized industry which is not difficult to learn. Club members may learn proper methods of management, feeding, sanitation and disease control and make a profit from their flocks. Keep in mind, however, that a profitable sized unit is important for market production. Poultry raisers should decide which size flock fits best into their farming program.

If producing market eggs and poultry is of minor importance, the smaller flock will be more satisfactory because of reduced hazards from disease, lower equipment and investment costs and small labor requirements.

If poultry income is intended as an important one on the farm, a flock of at least 300 to 400 layers will be more profitable than a lesser number. The owner will receive greater returns on his investment and labor.

### **Records Are Important**

Every egg producer should know the average number of eggs produced per hen every month and year, the cost of production, the per cent of flock loss from disease, cost of producing pullets for replacement, and the income from eggs and poultry meat. If poultry meat is produced in the form of broilers, fryers, or roasters the producer wants to know how much feed is required to produce a pound of gain, the percentage of chicks raised to market age, how quickly the bird reaches market age, and the return obtained from sale of the bird.

Without this easily obtained information you cannot have a true idea of the poultry enterprise. The records point out the weak places in the program. They make improvements and increased income possible.

Few business men hope or try to succeed without accurate records. Poultry raisers and 4-H Club poultry members are truly business men and should keep accurate records. These may help decide the question of whether or not poultry numbers on their farm should remain the same or be increased or reduced. You may obtain forms for keeping records on laying hens, young stock or broilers from your county agent.

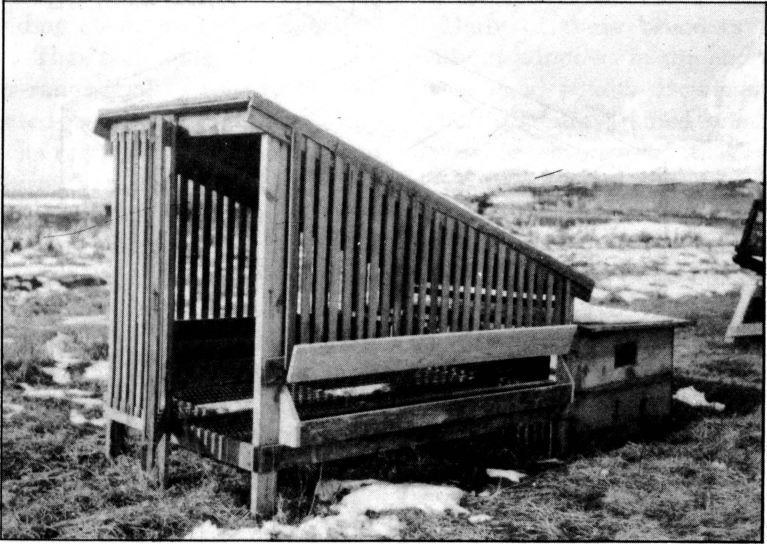
**EQUIPMENT FOR BROODING AND REARING**

Fig. 1.—The combination brooder and range shelter.

With proper equipment you can carry out a sanitation program and use proper management methods. In producing young stock, you and your parents should decide first on the size of your project. Together you might decide that you should produce all the chicks raised on the farm. Or, that you produce 50 chicks which would be kept separate from those produced by your parents. For broiler production, you might use the regular brooder house and equipment during the off season.

The combination brooder and range shelter is a most satisfactory piece of equipment for raising 50 chicks. This is true whether the club member raises 50 chicks separate from others on the farm, or whether only enough chicks are raised for family use, and

these by the club member.

For early spring brooding, which club members will choose, this unit is designed to brood 50 chicks. The brooder is heated with kerosene lamps or burners.

The material cost of the combination brooder house and range shelter equipped with a kerosene unit is approximately \$30 to \$35. This is the cost of new materials including a durable type roofing. If scrap lumber or native material is used and a less durable roof, the cost, of course, would be lower.

Raise chicks in confinement on the shelter's wire floor until old enough to no longer need artificial heat. Then detach the shelter from the brooding unit and move to clean ground where chicks are grown. Choose clean

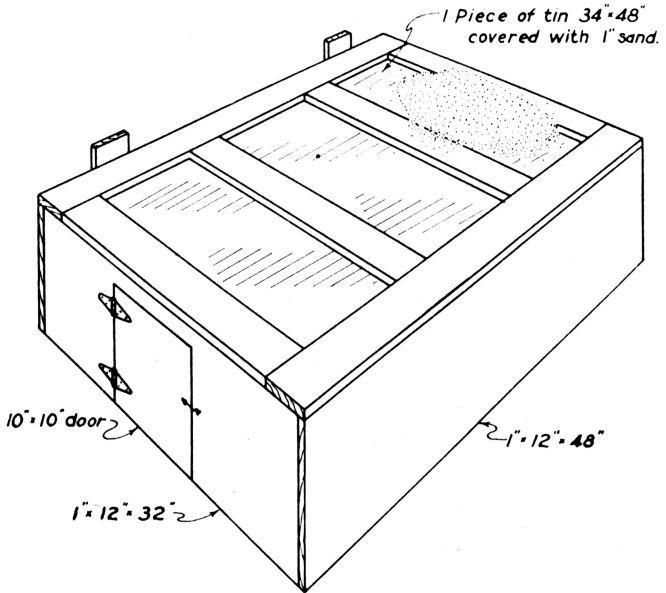


Fig. 2.—The base section of the brooder.

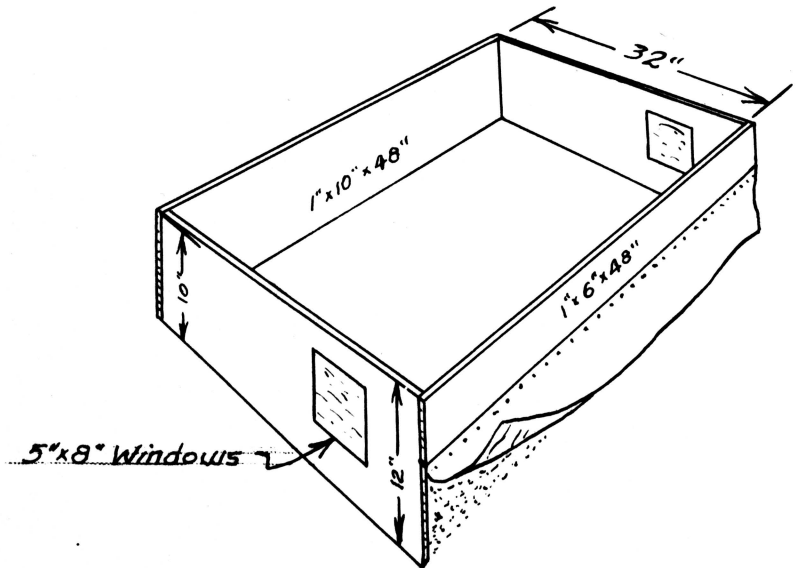


Fig. 3.—The middle section of the brooder.

ground where poultry droppings have not been spread or chickens raised for two years.

Providing clean ground is most important. This fact adds value to the brooder-range shelter because it may be located near the dwelling while the chicks require more attention, and quarters on range where the pullets may develop properly. Many failures in poultry production can be traced to lack of clean range and a well ventilated roosting shelter for the developing pullets. On farms where portable equipment is not provided, this is the principal reason for failure. This combination brooder, sun porch and range shelter meets all of these problems at one time.

### Brooding Unit

The brooding unit consists of four sections: the base, floor, middle section and roof.

The base (Fig. 2) is made of 1x12-inch lumber, rough or smooth. The floor is made of tin and framed with 1x4 material. Place sand on the tin to a depth of  $\frac{1}{2}$  to  $\frac{3}{4}$  inch and start the brooder at least two days before the chicks are placed in it to warm and thoroughly dry the sand. Bore six  $\frac{1}{2}$ -inch holes in the end of the base opposite the door to permit lamp fumes to escape.

Do not fasten the floor permanently to the base. It is more easily cleaned if removable.

To make the middle section, (Fig. 3), use a board 10 inches wide for the back. Make the ends of 1x12 material ripped to the width of the back

(10 inches). In this way the slope for the roof is provided since it fits directly on this middle section.

Many of these brooders are built without windows in the end and have given good results. However, the addition of double-paned windows is a desirable improvement. These windows provide light so day-old chicks can readily find feed and water. Two 5x8 panes are used in each window, with an air space between. This makes the brooder a little easier to heat than if just one pane is used. Small nails can be used for stops to keep the glass from going together. Putty the windows air tight around the edges.

The bottom view of the roof is shown in Fig. 4. Note notches which permit the shelter to fit snugly to the brooder unit.

A piece of old canvas or similar material is tacked to the front of the brooder. In early season brooding, a piece of cardboard may also be placed over this opening for the first week. From the month of April on this precaution usually is not necessary.

The canvas flap should not completely cover the opening at the bottom. Light must penetrate the brooder to attract the chicks to the sun porch for feed and water.

### The Combination Sun Porch and Range Shelter

A side view of the shelter is shown in Fig. 5, front and end views in Figs. 6 and 7 respectively. These diagrams show 1-inch mesh poultry netting in use on the end of the shelter to a height of 9 inches. This lessens the hazard of rats getting into the brood-

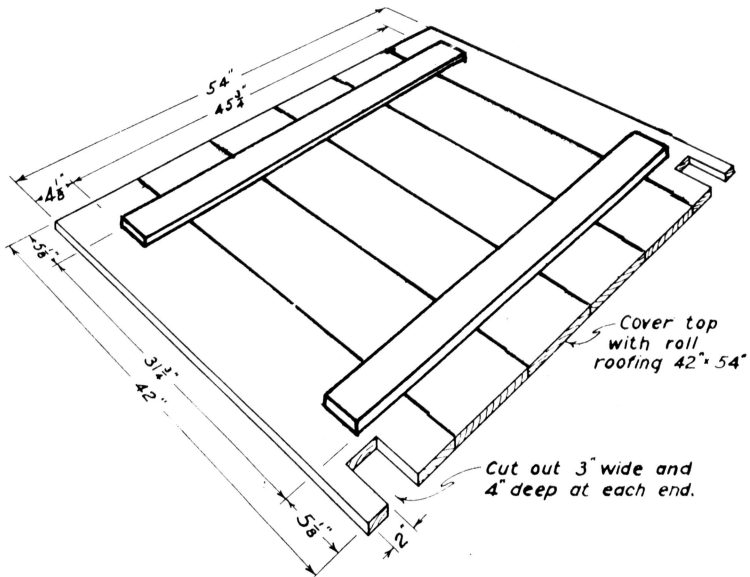


Fig. 4.—The under side of the brooder roof.

er. The remainder of the shelter is enclosed with lath as an economy measure. Obviously 1-inch mesh poultry netting can be used for the entire shelter if available. However, in these plans the amount of inch mesh poultry netting required is limited to one piece of 24-inch netting 12 feet long for the floor of the shelter, and one piece of netting 12 inches wide and 4 feet long, for the lower portion of the end of the shelter.

Pieces of lath cut off as one side is completed can be used on the other side of the shelter. All laths may be sawed at one time by tacking a guide strip along the top of the laths at the proper angle.

Inch mesh poultry netting is used for the floor of the shelter in preference to  $\frac{1}{2}$ -inch mesh hardware cloth, because it will not become clogged

with droppings and is also less expensive. Papers or sacks may be spread over the floor for the first week or ten days, after which the chicks will have no difficulty walking on this mesh wire.

The roof of the shelter can be made of three old burlap sacks painted with Portland cement and water mixed to about the consistency of roofing paint. After the cement has hardened, apply a coat of roofing paint. Such a roof is not absolutely water-tight, but is sufficiently so for summer growing conditions.

Other roofing materials could be used, including hard finished fiber board, which should also be given a coat of roofing paint. Also, metal roofing is satisfactory.

Install roosts in the shelter when the chicks are four weeks old. Place





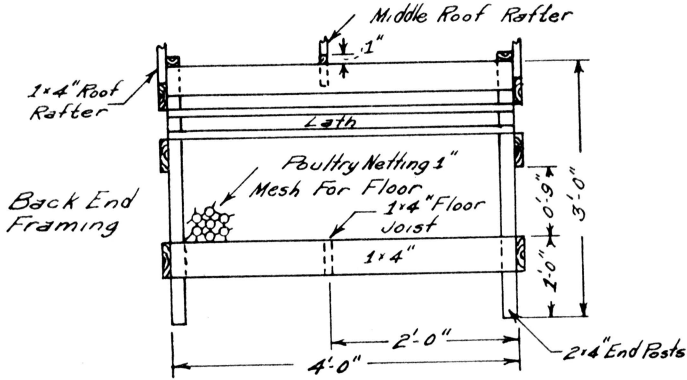


Fig. 7.—End view of range shelter, with details of framing.

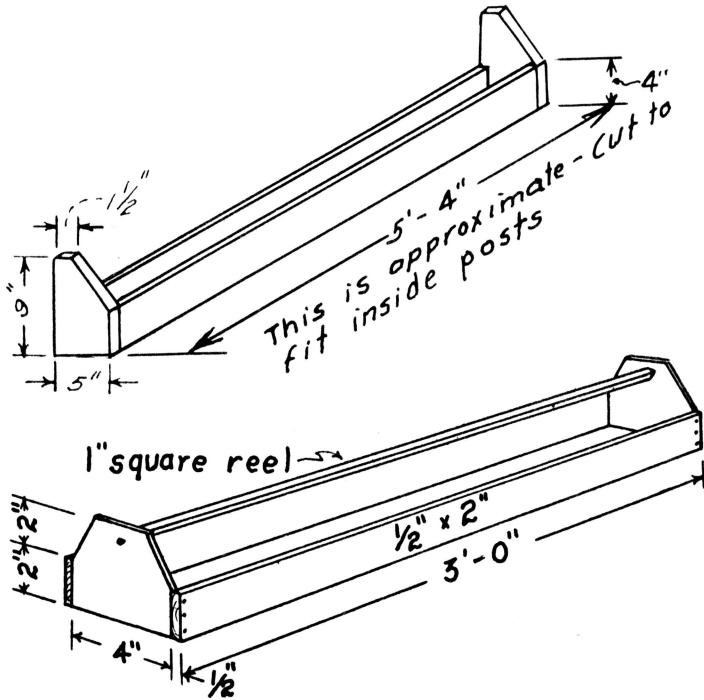


Fig. 8.—(Upper) Feeder for sides of shelter.  
(Lower) Small feeder for use first 3 weeks.

the side braces of the shelter at the proper height to serve as roost supports. The amount of roosting space needed will be determined by the number of pullets kept on range in

the shelter. If 50 sexed pullets were brooded, five poles spaced 12 inches apart would be needed, while three such poles would be adequate for 20-25 pullets.

One bundle of 50 laths is sufficient for the entire shelter, including the panel which is built to close the back end of the shelter after the brooding unit is detached.

The plan for building the feeders attached to the sides of the range shelter is shown in Fig. 8 (upper). A baby chick feeder, as shown in Fig. 8 (lower) is more satisfactory for feeding the first two or three weeks. The chicks will then have enough size to use the feeders built on the sides

of the shelter. A range feeder, as shown in Fig. 9, should be provided from eight weeks to maturity, to supplement the feeders on shelter.

### Materials for Brooder

First are listed the number of lengths of lumber you will have to buy from lumber yard or sawmill, and then the pieces into which the lumber must be cut before starting to assemble the materials in the finished structure.

#### Bill of Materials for Brooder

1—1"x12"—12' (ft.) long	1—1"x 4"— 8'	1—1"x4"— 8'
1—1"x12"—14'	1—1"x 4"—10'	1 piece tin 34"x48"
1—1"x12"— 8'	1—1"x 6"— 4'	Roll roofing 42"x54"
1—1"x10"— 4'	1—1"x 8"— 4'	Two kerosene lamps
2—8"x10" panes of glass cut to form 4—8"x5" pieces		

#### Cut as Follows:

2—1"x12"—32".....	Ends of base
2—1"x12"— 4' .....	Sides of base
2—1"x12"—32".....	Ends of middle section
1—1"x10"— 4' .....	Back of middle section
1—1"x 6"— 4' .....	Front of middle section
4—1"x12"—42".....	Lid or roof
1—1"x 8"—42".....	Lid or roof
2—1"x 4"—45".....	Lid cleats
2—1"x 4"— 4' .....	Floor
4—1"x 4"— 2' —2 <sup>3</sup> / <sub>4</sub> ".....	Floor

For the front of brooder, also provide an old piece of canvas 5 inches wide by 4 feet long.

#### Bill of Materials for Range Shelter and Sun Porch

4—1"x4"—12'	5 lbs. Portland Cement
5—1"x4"—14'	3 Pair Hinges
2—1"x4"—10'	1 lb. Lath Nails
2—1"x4"— 8'	1 lb. 6 Penny Nails
1—1"x6"—14'	1 lb. 8 Penny Nails
1—2"x4"—16'	1 Box Tacks
12'—24" Poultry netting 1-inch mesh	
4'—12" Poultry netting 1-inch mesh	
3 Burlap sacks or roofing 4'x7'. (Sacks, cement and tacks for roof.)	

**Cut as Follows:**

5—1"x4"— 6'	Bottom frame, roost supports, and floor joists
5—1"x4"— 7'	Roof framing and rafters
4—1"x4"— 4'	Ends of shelter, top and bottom (inside framing)
2—1"x4"— 4'-1½"	Ends of roof
1—1"x4"— 5'	Door support and brace (front of shelter)
1—1"x4"—12'	Door frame
6—1"x4"— 5'-2½"	Sides and bottom of feeders (approximate, see note on drawing)
2—1"x4"— 2'	Floor braces (cross members)
1—1"x4"—20¼"	} Upper nailing pieces for wire on front of shelter
1—1"x4"—16½"	
2—1"x6"— 5'-4"	Lids of feeders (approximate, see note on drawing)
4—1"x6"— 9'	Ends of feeders
2—2"x4"— 5'	} Legs of shelter
2—2"x4"— 3'	

**Bill of Materials for Chick Feeder**

1 pc. ½"x4"—3'	Bottom	1 pc. 1"x4"—8'	Ends
1 pc. ½"x2"—6'	Sides	1 pc. 1"x1"—3'	Reel

**For Larger Broods**

Where club members and their parents have worked out arrangements for the club member to produce all the chicks on the farm and it is to be a more sizable unit than just described, other brooding and rearing equipment would probably be more desirable. A 10 x 12 ft. Missouri colony brooder house will accommodate 250 to 300 chicks for replacement stock or 150 broilers to 10-12 weeks of age. The Missouri 20 x 20 ft. brooder house will care for 800 chicks up to the time a sun porch will be used, or 500 broilers to market age. This is allowing five-tenths square foot per bird for replacement stock and eight-tenths square foot per broiler to market age. And a summer range shelter would be needed in the brooding and rearing operations for each 125-140 pullets raised. This shelter is 9 x 12 feet

in size and can be used for a dual purpose. It can be moved up beside the colony brooder house and used as a sun porch until the pullets are ready to go out on the range. This permits a good sanitation program, as the chicks can be kept off contaminated ground during the brooding period.

When the pullets are eight to ten weeks old they can be moved out to clean range and the range shelter used for housing until fall. Circular 536, "The Missouri Range Shelter," which you can get from your county agent, gives plans for the construction of the Missouri summer range shelter. If a new brooder house is needed, you can obtain a copy of Circular 552, "Brooder Houses," which gives plans for construction of the 10 x 12 colony brooder house or the 20 x 20 brooder house.

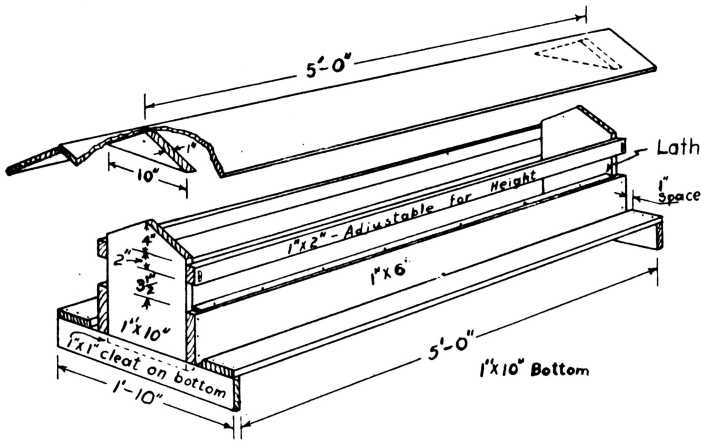


Fig. 9.—A good type range feeder.

The range shelter provides ideal roosting quarters for the pullets during summer. It is just as important, however, to provide proper feeders and waterers. For each range shelter provide three to four 5-foot range feeders or attached side feeders. Plans for building the 5-foot range feeder are available in Circular 531, "Home-

made Poultry Equipment." Plans for the side feeders on the range shelter are available from your county agent.

Also, a barrel waterer with float valve control will provide adequate water with a minimum of labor. In some cases water is piped to range from ponds by gravity or from pressure water systems.

### BEGIN WITH QUALITY CHICKS

Quality in poultry, as in all other classes of livestock, has distinct advantages and will pay in the long run.

Chicks purchased on price alone, particularly when low, are likely to be a poor bargain as broilers or as mature pullets. It costs just as much for equipment, feed, labor, and all other production expenses whether you raise poor or good quality chicks.

The variety of chickens is not as important as the strain selected within the breed or variety. In most cases a different strain is used for broiler hatching egg production and for eggs

being sold for consumption. It is desirable to select the more common breeds of chickens such as White Leghorn, Rhode Island Red, New Hampshire, White or Barred Rock, or White Wyandotte. Some producers favor one of the incrossbred selections. It is harder to get hatching eggs, breeding stock or baby chicks of good breeding from the less common varieties that have no superior money making qualities. From one-half to two-thirds or more of the total poultry income is derived from eggs. The importance of getting chicks that will develop into

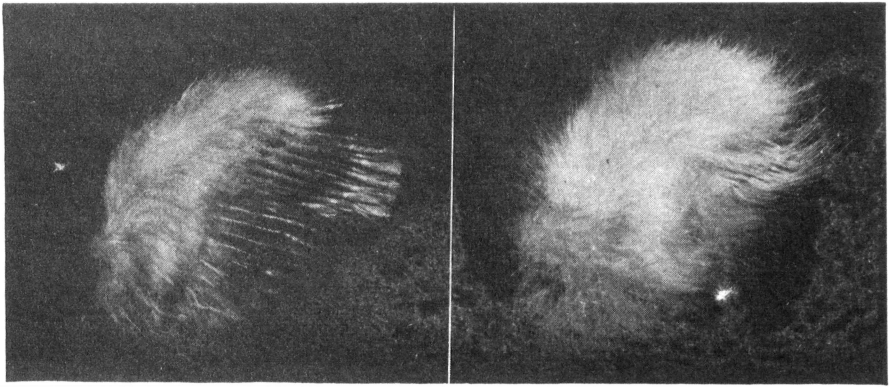


Fig. 10.—Fast feathering wing (left) and slow feathering (right) at hatching time. Both of same breed. (Courtesy Maryland Agricultural Extension Service.)

high producing pullets cannot be over-emphasized. Missouri farm flock records over a period of years show that the net income above all expenses is two and one-fourth times greater in flocks that lay an average of 150 eggs as compared to those that lay slightly less than 100 eggs.

The number of eggs laid is only one of several important considerations. Large egg size (24 ounces or more per dozen), freedom from disease, and the vigor and vitality of the parent stock are also important.

True pictures about all of these characteristics are not always presented in glowing advertisements. The club member and his parents should carefully check all of these important matters in determining desirable chick sources.

Obtain chicks from flocks that have been carefully tested for pullorum disease. This disease, which is transmitted in the egg and spread in the incubator and in chick brood, after hatching, is responsible for high chick losses up to three weeks old. Testing

the parent stock to remove infected hens, and strict sanitation in the hatchery and incubator reduce loss to a minimum.

Quality chicks cost more. But reliable producers cannot be expected to sell this superior stock at prevailing competitive prices. However, the additional cost of \$5 or even \$15 per hundred chicks is actually the best investment you can make for success in poultry raising. Mortality throughout the life of quality birds is likely to be much smaller, and net returns with proper care and management are almost sure to be much greater.

Obtain chicks that feather rapidly, particularly if you produce broilers and fryers. Broiler-fryer producers want chicks that are fast growing, efficient users of feed, and which have full, plump breasts and compact bodies.

Fortunately, chick buyers can tell whether or not the chicks are fast feathering by observing the development of the wing feathers. In fast feathering chicks there will be sev-

eral (usually six to eight) long spike-like primary feathers that are readily seen. Also, there will be about as many well developed secondaries. However, they will not have as much length as the primaries. In slow feathering chicks the primaries and secondaries will have made very little development and will be obscured by the down.

Rapid feathering chicks will also have well developed tails at ten days of age and will be well feathered over the back and rest of the body at eight weeks.

### Know Chicks' Breeding

A program known as the National Poultry Improvement Plan has been developed to promote improvement in breeding and production qualities in poultry and to reduce pullorum losses in chicks. Hatcheries and flock owners in Missouri, participating in this improvement plan, operate under the supervision of the Missouri Poultry Improvement Committee. The plan includes definite breeding stages and pullorum control and eradication classes. Hatcherymen cooperating with the plan use uniform terminology in advertising the chicks they sell. Such uniformity in advertising makes it easy for the purchaser to know something about the quality of the chicks.

Club members will want to be familiar with the major differences represented in the terminology used. The meaning of these terms needs to be understood so that club members can make their purchases intelligently, if obtaining chicks from one of these member hatcheries.

There are three breeding stages that the club member will particularly want to know about in making chick purchases.

1. **U. S. Approved**—These chicks are from flocks where both males and females are selected for constitutional vigor and for standard bred and production qualities. Hatching eggs must weigh one and eleven-twelfth ounces each.

2. **U. S. Certified** — These chicks are from flocks where the females are selected as in the Approved flocks and mated to U. S. Record of Performance males. U. S. R. O. P. males are produced from U. S. R. O. P. hens that laid 200 or more eggs averaging 24 ounces or more per dozen. Also, these males have passed inspection of an official state inspector. Hatching eggs in the certified breeding stage must weigh one and eleven-twelfth ounces each and average 24 ounces per dozen.

3. **U. S. R. O. P.**—These chicks are from R.O.P. hens in individual male matings headed by R.O.P. males. The females must have laid 200 or more eggs during the year's production to qualify as R.O.P. hens. Also, the males come from hens that have laid 200 or more eggs. The average egg weight requirement of R.O.P. hatching eggs is 25 ounces per dozen.

The pullorum control and eradication classes and the differences they represent should be understood. They are:

1. **U. S. Pullorum-Controlled**—In this class the tolerance is fewer than 2 per cent of reactors in the flock.

2. **U. S. Pullorum-Passed**—These

flocks must contain no reactors on the last test made.

3. **U. S. Pullorum-Clean** — These flocks must contain no reactors in the last two consecutive tests made not less than six months apart.

No attempt has been made in this discussion of breeding stages and pullorum control and eradication classes to give full and detailed requirements for the flocks, or the requirements of the hatchery producing the chicks. Only the basic flock requirements are given, which should be understood by every club member. Those wishing complete information should obtain the official publication on the plan.

### **Time of Hatching**

The time of hatching will depend a great deal on when the best markets will be available for the eggs or poultry meat produced. If a broiler project is selected, the time when brooding equipment is available will also need to be considered.

Chickens of the heavy breeds that are to be used for egg production should be hatched in February or early March. Leghorns should be hatched in March or early April.

Early hatched pullets develop into larger, heavier birds at maturity and start laying in the late summer or early fall when egg prices are higher. Cockerels reach broiler weights when prices are normally higher than those received from later hatches.

Early hatched chicks are less likely to become infected with coccidiosis because the parasite causing this disease requires warm soil and moisture to become actively infective. This is

also true of worm infestation which does more harm to infested chicks under 12 weeks of age than to older ones.

Chicks use feed for growth to better advantage during cool weather. Consequently, early hatched chicks gain in weight and size at lower cost.

### **Selection of Hatching Eggs**

Desirable hatching eggs are normal in shape, clean, and have sound shells. Eggs with rough, porous shells, or those with ridged, unusual or irregular shapes should not be used for hatching purposes. Such eggs hatch poorly. In addition, these characters in eggs are inherited. The few pullets hatched from eggs of this appearance are likely to produce similar eggs which have lower market value.

Since the size, shape and color of eggs are inherited characters, uniformity of these characteristics should guide selection. White eggs should be free from creamy tints and be chalk white in color. Brown shelled eggs may vary slightly in color, but a uniform shade is desired. It can be obtained by careful selection.

Small eggs will not produce large vigorous chicks and should never be used because the pullets from such eggs are likely to lay the kind of eggs from which they were hatched. Hatching eggs should each weigh two ounces or slightly more.

### **Incubation**

Chicks of different ages, even though no more than three or four days apart, should not be brooded together. This slight difference in age is important because chicks grow



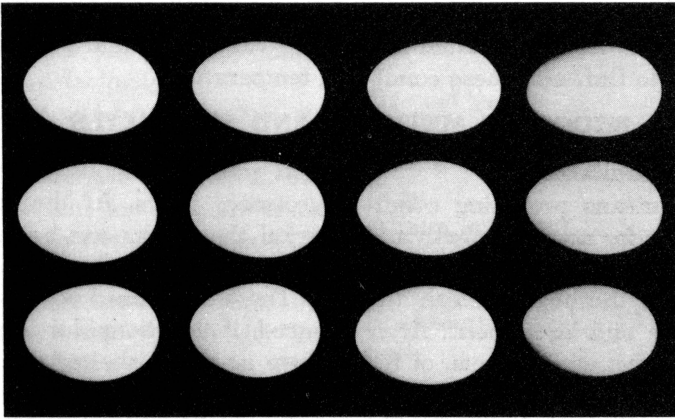


Fig. 11.—Eggs of normal (and desirable) shape for hatching.

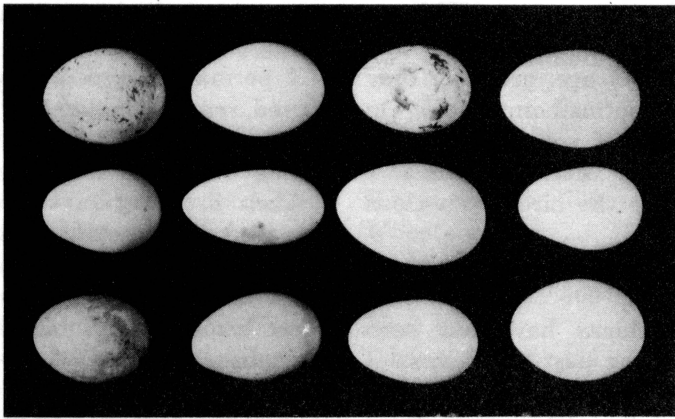


Fig. 12.—Eggs of undesirable shape for hatching.

rapidly and the smaller chicks die in large numbers if forced to compete with the older chicks for feed, water and warmth. The number of chicks desired for one brooder house should be obtained at the same time. This means artificial incubation is almost essential.

It is usually less expensive and more satisfactory to purchase chicks or have the eggs hatched in modern in-

cubators which normally produce more vigorous chicks.

If a small farm incubator is used, follow the operating instructions of the manufacturer. However, check the incubator thermometer in warm water with a fever thermometer to be sure of its accuracy.

If the hatch in these small machines is early and the chicks small, probably the temperature of the incubator

was too high, or the amount of moisture too small. If the chicks hatch late and are slow to fluff out, these condi-

tions indicate too much moisture, too little ventilation and possibly too low a temperature.

## BROODING METHODS AND MATERIALS

### Sanitation

Sanitation means providing conditions favorable for normal growth and healthy chicks. At the start of the brooding year, thoroughly clean the brooder house and equipment. After cleaning, disinfect with one can of lye to 12 gallons of water. Such a clean-up program will greatly lessen the danger of infecting the newly hatched chick with any disease that might have lived over.

If you raise broilers for marketing at 10-12 weeks of age, probably they will be kept confined until sold. On the other hand, if you are taking a young stock or flock replacement project, provide the birds with clean range.

For clean range or clean ground select a place:

1. Where chicks have not been raised during the past two years.
2. A way from contaminated ground about the old poultry yards, or ground that receives water drainage from such areas.
3. On ground where poultry litter and droppings have not been spread for at least two years.
4. When possible where green feed such as a grass and legume mixture or legume crops can be provided. These may be alfalfa, sweet clover, red clover, ladino, or Korean lespedeza.

Club members should select three

clean ground locations for use in three successive years. At the end of this period the chicks can be returned to the first area and the rotation repeated. These areas need not be separately fenced if locations for the brooder house or range shelter are 150 yards apart.

If movable brooder quarters are used, thoroughly clean and disinfect the building before moving to prevent spreading diseases and parasites to the clean location.

If permanent brooding equipment is used, remove the litter to a safe distance to avoid any possibility of infecting the brood from this source.

When brooding in confinement is practiced, it is best to keep a pan of disinfectant just outside the brooder house door so the caretaker can disinfect his overshoes before entering the house.

### Equipment

Chicks must be brooded under sanitary conditions. Equipment to make this possible has already been discussed. If more than 50 to 75 chicks are brooded, it will be necessary, of course, to use a regular brooder house. In this case a good brooder stove is very necessary. A brood of chicks that becomes over-heated is seriously injured. Chilled chicks also become poor property. Avoid stoves that are hard to regulate. Any good wood, coal, oil, gas, infrared, or electric brooder will

give satisfactory results. A homemade electric brooder, if properly made, will work satisfactorily.

A sufficient number of feeders and waterers should be provided. Two 3-foot chick feeders, feeding from both sides, is sufficient for each 100 chicks for the first two to three weeks. From the time the chicks reach three weeks of age until they are eight weeks old, use an intermediate type feeder that is larger than the chick feeder. During this period, provide three of the 3-foot intermediate feeders for each 100 chicks. If 50 chicks are raised in the combination brooder and range shelter, feeders built on the side of the shelter will provide sufficient feeder space at this time.

### Feeding

Make sure that chicks receive unlimited amounts of proper feed. Start them on feed when not more than 24 to 36 hours old. Further delay in feeding is harmful. To help get chicks started on feed, place cardboards holding a little feed under the edges of the hover.

A brooder ring of cardboard or wire netting will help the chicks learn the source of heat, feed and water. Place brooder ring 2 to 3 feet from hover.

An all-mash ration is recommended for the first eight weeks. For broilers, feed the broiler ration until the birds are marketed. Formulas for two different chick starters and two broiler rations recommended by the College of Agriculture are listed. Club members should set a goal to get a three pound broiler in 10 to 11 weeks on 9 to 10 pounds of feed.

### Chick Starters Nos. 1 and 2

	lbs.	lbs.
Ground yellow corn .....	230	270
Shorts .....	75	75
Bran .....	25	50
Alfalfa leaf meal ....	50	25
Meat scraps .....	35	50
Dried whey .....	---	25
Soybean oil meal ...	75	---
Salt .....	2.5	2.5
Ground limestone..	5	5
Codliver oil or feeding oil (300 Unit D) ..	1	1
<b>Total .....</b>	<b>498.5 lbs.</b>	<b>503.5 lbs.</b>

### Broiler Rations Nos. 1 and 2

	lbs.	lbs.
Yellow corn meal .....	1200	1050
Wheat shorts ..	100	200
Wheat bran ...	---	75
Soybean oil meal .....	400	450
Meat and bone scraps ..	100	---
Fish meal .....	50	70
Dried milk or whey .....	50	60
Alfalfa meal ....	60	30
Steamed bone meal ...	---	20
Ground limestone ...	30	30
Salt .....	10	10
Feed oil (300 Unit D) .....	5	5
Manganese sulphate .....	1/4	1/4
<b>Total .....</b>	<b>2005 1/4 lbs.</b>	<b>2000 1/4 lbs.</b>

The chick starter, without grain, is kept before the chicks until they are eight weeks of age. If the pullets are for replacement purposes, they should be changed to a grower mash, with grain. They, of course, should be moved to their summer quarters. The cockerels could be sold at this time as broilers.

Club members who are raising broilers or who sell all of their chicks as fryers or roasters can use the broiler ration until the birds are marketed. In cases where the pullets are to be kept and the cockerels sold, a simple method of feeding would be to continue with the chick starter even after the chicks reach eight weeks of age. In addition, grain would be fed.

### For Growing Pullets

Growing mashes for pullets which have been found satisfactory and have been recommended by the College of Agriculture are:

	lbs.	lbs.
Ground yellow		
corn .....	100	100
Shorts .....	100	100
Bran .....	100	100
Alfalfa leaf meal .....	16	16
Meat scraps .....	40	30
Soybean oil meal .....		30
Dried milk .....	20	---
Salt .....	4	4
	<hr/>	<hr/>
Total .....	380 lbs.	380 lbs.

Whole or cracked yellow corn or one-half yellow corn and one-half wheat, barley, or kafir may be fed. Both mash and grain should be constantly supplied in open hoppers. This

results in faster growth and heavier pullets that will lay more winter eggs and return a greater profit.

If enough wheat and oats are available on the farm there is no need to purchase shorts or bran. Wheat can be ground and replace the shorts, and good oats can be ground to replace the bran.

Each light breed pullet, if fed from 24 hours of age to maturity at 20 weeks, will eat about eight pounds of all-mash starter, six pounds of growing mash and six pounds of grain.

Heavy breed pullets will consume 9 pounds of starter, 10 pounds of growing mash and 10 pounds of grain to 24 weeks of age.

### Management 8-12 Weeks

Crowding chicks results in slower growth, higher feed costs and greater death losses, and the pullets raised are of poorer quality. For these reasons, the greatest number to be raised for replacement flock in a 10 x 12 ft. brooder house is 250 to 300; 800 in the 20 x 20 ft. brooder house; and 50 chicks in the combination brooder and shelter unit. If you are raising broilers to market at 10 to 12 weeks this number should not be over 150 for the 10 x 12 ft. brooder house or 500 for the 20 x 20 ft. brooder house. This allows eight-tenths square foot for each broiler chick started.

Brooding temperature is important. Brood chicks at the lowest temperature that will keep them comfortable. This means starting the first day at a temperature of not more than 95° F. at the edge of the hover. Reduce this temperature five to eight degrees



Fig. 13.—Ready for baby chicks with feeders, waterers and brooder ring in place.

at the end of the first week and a like amount at the end of the second and third weeks. When a temperature of 70° to 75° F. is reached, maintain it until artificial heat is no longer needed.

Watch the chicks to guard against crowding. Broiler growers do not use roosts for their birds. This is also true of many who raise young stock for replacement purposes. If there is particular trouble from crowding, the temperature and ventilation should be checked. The corners of the house can be rounded by using cardboard.

If desired, low roosts for young stock may be placed in the house when chicks are three weeks old. These may be 1 x 1 or 1 x 2 inch boards. The corners of the pieces should be rounded. The roost may be located at the

rear of the building. In the beginning they should be from two to three inches above the floor. After the chicks learn to roost they may be raised to 18 or 24 inches above the floor. Inch poultry netting should be tacked to the lower side of the roosts and extended to the floor in front of them. This will prevent the chicks from picking the droppings, improve sanitation and reduce labor.

The litter used will depend somewhat on the material available. Ground corn cobs, shavings, sawdust, chopped straw or one of the commercial litters will work satisfactorily. When new litter is used, start with two to three inches spread evenly over the floor. Add more as needed until about four inches deep. In the brooder houses hydrated lime may be used at

the rate of 10 to 15 pounds per 100 square feet to help keep drier litter.

If more than one brood of broilers are being raised—deep, dry litter can be reused. If a disease problem arises, thoroughly clean the house and disinfect before another brood is started. Keep the litter stirred. This helps keep the litter loose and dry.

If the combination brooder and shelter unit is used in brooding, you'll need two kerosene burners to supply enough heat for early brooding. Setting the unit in a protected location is also desirable in early brooding. In this unit, sand is used as the litter in the brooder. No roosts, of course, are placed in the brooder part of this unit. It is desirable, however, to install roosts in the shelter part of the unit when the chicks are three to four weeks of age. Roosts are installed by attaching them to the side braces of the shelter.

### Newcastle Control

During the past few years Newcastle disease has become widespread in poultry. This virus disease may occur in susceptible birds of any age from two to six days old to mature birds. The disease is easily spread. Early symptoms are gasping, sneezing and rattling—which may be followed by nervous symptoms. Nervous symptoms may be complete paralysis, or twisting of the neck, or walking in circles, etc. As with any disease, a diagnosis by a veterinarian should be made to definitely identify the trouble. The present control methods are strict sanitation, quarantine and vaccination. When there is a possibility

of chicks being exposed to Newcastle virus, vaccination of day-old chicks with a good intranasal vaccine is a good practice. This is given by placing a drop of the vaccine in one nostril of the chick. Intranasal vaccine will give a good resistance for 2½ to 3 months. This should carry broilers through to market age.

If the club member is raising young stock for replacement or a laying flock, use a good wing web vaccine when the birds are 3 to 3½ months of age. Live virus wing web vaccine should *never* be used on a laying flock. Isolate young vaccinated stock from the laying flock not carrying an immunity.

A "take" occurs from the fifth to seventh day and is noticeable as sneezing and coughing.

### Coccidiosis Control

Sanitation is the best prevention for coccidiosis. However, even after all precautions are taken, there may be an outbreak of coccidiosis in the chicks. The common symptoms of coccidiosis include loss of appetite, ruffled feathers and a droopy, ragged appearance. Blood is occasionally seen in the droppings which is a sure sign of the disease. However, many chicks have this disease without showing any sign of bloody droppings.

If an outbreak occurs, the litter should be kept dry and clean. Also, particular attention should be given during an outbreak to provide plenty of heat for the birds. A little higher temperature than normal is desirable.

**Treatment** — Add dried milk or whey at the rate of 40 pounds to 100



Fig. 14.—A group of chicks affected with coccidiosis.

pounds of mash. An additional amount of feeding oil should also be added to the ration. This may be fed by pouring a fine stream on the mash in the trough. This treatment should be continued for four or five days.

Some types of medication are usually used in addition to the above treatment. Use the medication carefully as directed. Chicks will often drink water when they will not eat. If the drug is already in the feed as a preventive, do not feed at the curative level.

For additional information on coccidiosis, see Bulletin No. 536, "Coccidiosis in Chickens and Other Birds."

### Management of Young Stock

After pullets reach the age of eight to twelve weeks the task of raising a healthy pullet flock is only well begun.

The need for sanitation is just as important during the remainder of the growing period. Clean range is still important to avoid round worm in-

festation and coccidiosis infection.

Pullets that become infested with worms make slower growth and consume more feed to maturity because they do not start to lay as early and seldom have the vitality to continue in production during the winter months.

Money spent for worm treatments is poorly invested because the trouble can be avoided and the cost of raising better pullets reduced.

The range should provide green feed and shade. An alfalfa, clover, lespedeza or improved pasture field on the edge of a corn field provide excellent locations for the portable brooder house or range shelter.

A continuous supply of tender green feed is desirable. The feeding of pure sudan grass, rape or other forage plants is recommended when necessary to supply ample green feed.

The range should provide limited shade. Dense, heavy shade which is not reached by sunshine sometime during the day is not desirable. Sun-

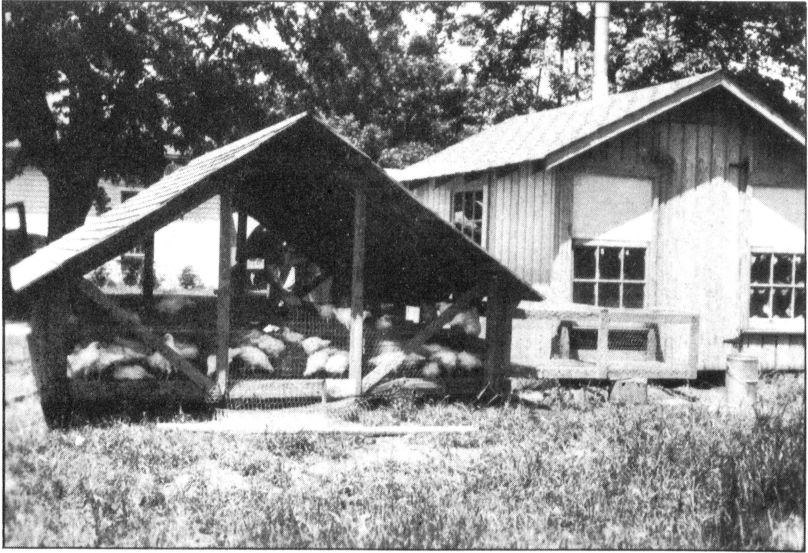


Fig. 15.—In early weeks of brooding, the range shelter is used as a sun porch near the farmstead.

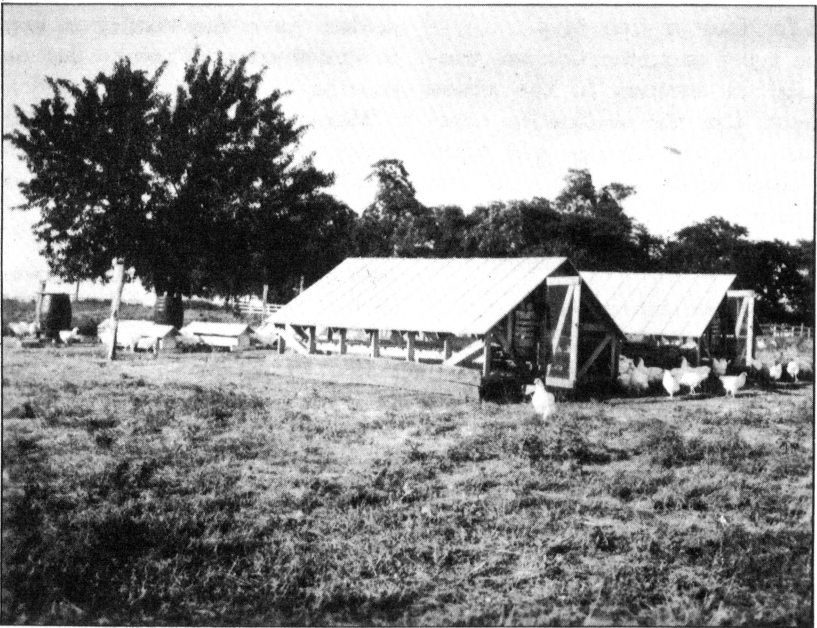


Fig. 16.—Pullets on range to which the range shelters and other equipment have been moved.





Fig. 17.—Hen affected with fowl pox.

light has a disinfecting effect which is needed. However, some shade, particularly during the hottest part of the day, is essential. If natural shade is lacking a brush arbor can be built for protection.

It is important that pullets have plenty of room and that their quarters be comfortable and well ventilated. Crowded conditions cause slow uneven growth and many undesirable pullets. The range shelter provides the best housing possible for pullets in the summer. In addition to providing comfortable rooming quarters, it is very easily moved to clean ground.

Liberal feeding must be practiced. Growing mash, grain, oyster shell, and plenty of clean, fresh water should be available for the pullets at all times. Water and feed should be placed in a shady place to encourage consumption. Improved sanitation can be obtained by placing the feeding and watering equipment on wire platforms. Water and feed that is wasted

falls through the wire netting and cannot be reached.

Club members should be on the watch throughout the summer for lice and mites. Numbers frequently build rapidly during hot weather and reach large numbers before they are recognized. By observing the pullets and the roosting quarters occasionally, proper control methods can be applied if lice and mites are found.

### Fowl Pox

Fowl pox may be controlled by vaccinating pullet flocks between the ages of 8 and 12 weeks. This produces immunity for life provided the recommended fowl pox virus vaccine is used. Pigeon pox virus is not recommended.

Fowl pox usually breaks out in the fall or early winter. It appears as raised brown wart-like scabs on the comb, wattles and bare parts of the head. In cases of light infection, these scabs are often mistaken for scratches resulting from pecking, fighting and other minor injuries.

Vaccination is simply done by removing a few feathers from the thigh of the young pullet and applying a very small amount of the vaccine to two or three follicles where the feathers have been removed.

Vaccination is recommended on only those farms where pox infection has caused trouble in previous years or in communities where infected flocks are quite common. There is no need to vaccinate for the disease if it has not caused trouble in the community because the process of vaccination would introduce the infection

on farms where it has not been present. The introduction of the infection, whether from other flocks or by vaccination, requires an annual vaccination of pullet flocks to prevent future outbreaks of the disease.

### **Change Ration**

After the pullets are housed, gradually make the change from a growing mash to laying mash by mixing increasing amounts of laying mash

with the proper feed. In ten days the change should be completed.

The onset of laying should occur naturally. The age at which pullets start to lay is an inherited characteristic. It is a mistake to attempt to force heavy egg production or to try to delay the onset of laying. Properly fed, healthy pullets will start laying when they mature, and until they are ready they should not be unduly stimulated to start production.

## **LAYING HOUSE AND EQUIPMENT**

A comfortable poultry house is necessary to secure profitable egg production during the summer months as well as during the winter. It is also essential to maintain a healthy flock.

A comfortable poultry house need not be expensive, but it should have certain important characteristics which can be obtained on any farm.

A good poultry house should be dry, well lighted and ventilated, and reasonably warm. The walls must be tightly constructed to prevent drafts that cause colds and roup to develop. Old houses may be repaired to provide tight walls by a number of different methods. Straw or similar material may be packed between the studs and held in place by old fencing. Cardboard cartons or roofing paper may be used. Any of these temporary methods are successful since the most important thing is that of keeping the hens comfortable at low cost. New houses or ones that have good material in them should, of course, be built or repaired with the comfort of the hens in mind.

A damp house is always uncom-

fortable. Moisture may come from the floor, or collect on the roof and sides of the building due to improper roof construction or poor ventilation.

### **Floors for the Laying House**

Either a dirt or concrete floor can be used successfully. If a dirt floor is used, the building needs to be built on a well drained location. The dirt floor inside the laying house should be four to six inches higher than the surrounding outside ground level. In addition, sloping the ground away from the poultry house helps insure good drainage.

If concrete is used, the thin section concrete floor is satisfactory.

Perhaps your club leader or some other successful poultry raiser in your community will show you how a thin section concrete floor is built.

Whichever type floor is used, plan to use a "built-up" litter program. The litter used may be ground corn cobs, shavings, sawdust, or chopped straw. The "built-up" litter program is started in the fall as the pullets are housed. Two to three inches of litter is spread

over the floor. This is increased until six to eight inches of "built-up" litter has accumulated by cold weather. Proper ventilation is very important in keeping a dry litter. When necessary, stir the litter. If dampness is a problem, stir in 10 to 15 pounds of hydrated lime for each 100 square feet of floor area. If a dry, loose "built-up" litter is maintained, the laying house need be cleaned only once a year.

#### **Insulation in the Laying House**

Metal roofs are satisfactory for poultry houses if properly insulated. Unless this is done, however, moisture collects on the inside surface and causes a damp, as well as a cold, uncomfortable house.

The ceiling should be no higher than necessary to provide head room for caretaker (usually 6½ to 7 feet). Houses with high ceilings are cold. A large part of the heat loss during winter occurs through the roof and the largest amount of heat penetrates through the roof in summer. For these reasons, a straw loft is desirable to reduce ceiling height. It aids in keeping the house dry and makes it warmer in winter and cooler in summer. If the height of the roof permits, the loft should consist of 10 to 12 inches of settled straw which may be supported by poultry netting or old woven wire fencing or by some other simple method. If part or all of the roof is too low for such a loft, pack straw between the rafters as a means of obtaining insulation in the lower portions and the loft where height permits.

#### **Ventilation**

**Improper ventilation is usually the**

result of too small an amount of fresh air. This causes the air in the house to become damp. The moisture collects on the walls of the building and on the floor. This dampness combined with the need for more fresh air produces an unhealthful condition that lowers egg production and make disease outbreaks almost certain.

One of the best means of ventilation is accomplished through an open front which is usually 24 to 30 inches in width. During cold weather the size of the opening may be regulated with a curtain or series of them made from feed sacks. This opening is seldom completely closed. More flocks disappoint their owners because of too little fresh air than because of too much

The most comfortable poultry houses are at least 20 and preferably 24 feet deep. Narrow houses are difficult to ventilate because they are drafty and cold when an adequate supply of fresh air is provided and are stuffy and unhealthful without the necessary exchange of air. Houses of proper depth when equipped with an open front are easily managed, require little attention and produce excellent results. The rule of one square foot of open front for every 15 square feet of floor space is used in determining the size of the open front. The open front should begin 18 to 24 inches above the inside floor level of the house and extend upward 24 to 30 inches. In houses over 30 feet deep, controlling air movement by the use of fans works successfully. Ventilation flues or stacks, and baffle ventilators usually prove unsatisfactory. These require much attention, often

fail to work, and sometimes work directly opposite to the intended way.

### Light, Cheerful House Desired

A comfortable house should be light and cheerful. Small windows should be arranged on all sides of the house to light all of the floor space and enable the hens to use all of it. Removal of these windows during the summer also makes the house cooler. The windows must be tightly fitted, however, to prevent drafts in winter. Special laying, scratching and roosting rooms in a house make it dark, reduce the number of birds that can be kept and serve no good purpose.

### Equipment for the Laying House

Eight to ten inches of roosting space is required per bird. Droppings pits

are proving the most satisfactory type of roosts for laying hens. The roosts are covered with 1 x 1½ inch welded wire to keep the birds out of the droppings. The droppings pits add to sanitation in the house and also help provide clean eggs. Roosts are usually made from 2 x 2 inch material with the upper corners rounded off.

The droppings pit has been gaining rapidly in popularity in the past few years. Most poultry raisers who had droppings boards in their laying houses have changed to the droppings pit. The use of the droppings pit makes it easy to see all birds as one enters the house. They do not leave any dark corners in which sick birds may hide. They require less frequent cleaning than the droppings boards and are thereby labor savers.

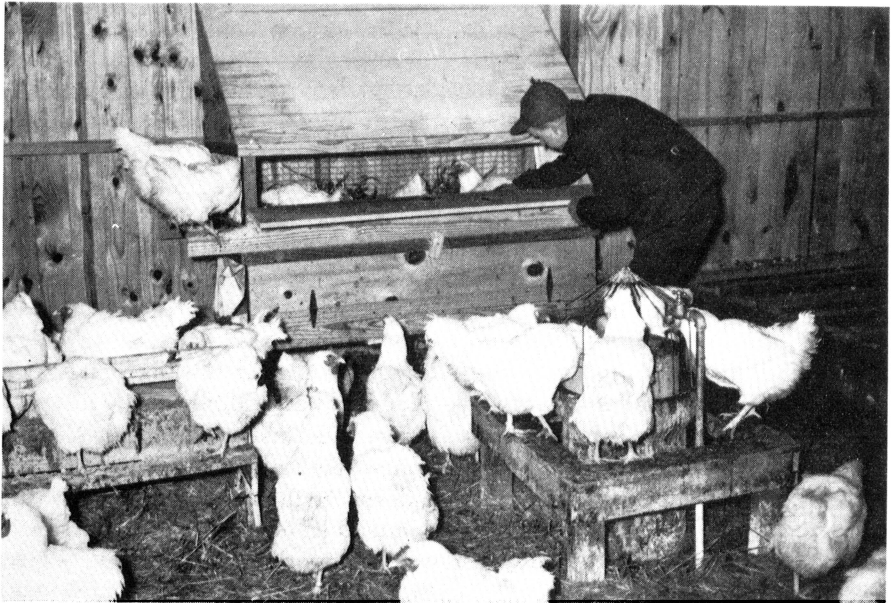


Fig. 18.—Community nests, automatic waterer and droppings pits are modern poultry house equipment.

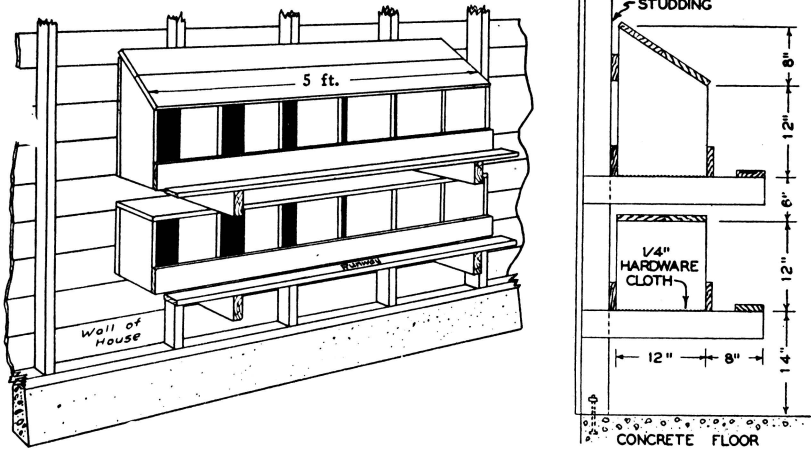


Fig. 19.—Double tier of wall nests. At right is end view showing details of construction.

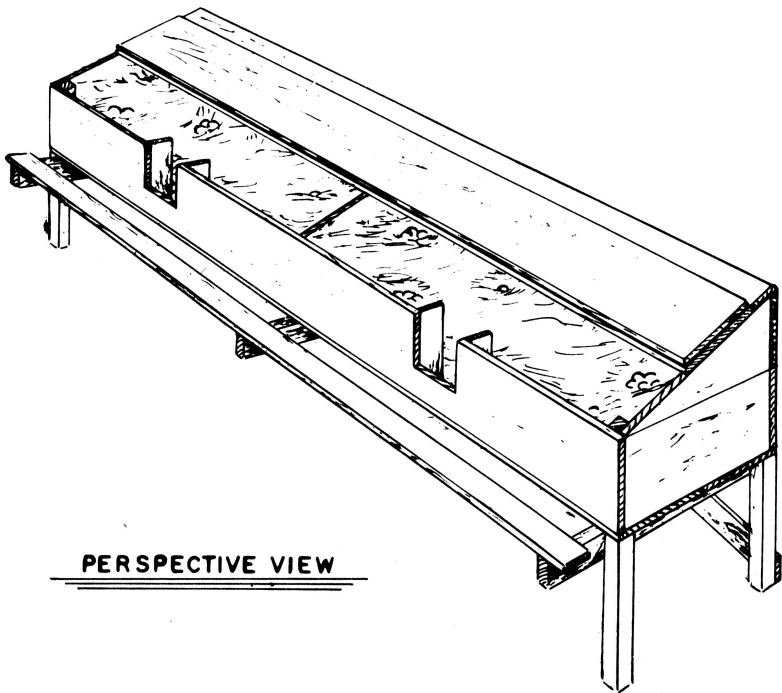


Fig. 20.—This 2'x10' community nest will care for 100 layers.

A few producers building a new house or remodeling a laying house are using no roosts. A built-up litter program is important if this is tried. If no roosts are used, the pullets are raised without roosts. Thus when moved to the laying house, they are not accustomed to roosts.

Either individual nests or community type nests prove satisfactory. If individual nests are used, provide one nest for each five or six hens. If community nests are used, provide one two-story 2' x 5' nest for 100 to 125 hens.

Two mash feeders four to five feet long are necessary to provide adequate feeder space for 100 hens. If grain is also fed in feeders, additional feeder space would need to be provided. Some poultry raisers prefer to feed their grain night and morning in regular V-shaped troughs.

Provide at least one automatic waterer in each 20 x 20 ft. house. The

waterer should have a heating element so that the chill may be taken off during the winter. Raise both feeders and waterers above the floor enough to prevent the litter from being scratched into them. As a rule 12 to 16 inches is a desirable height. The waterer in particular should be placed on a sanitary platform so that any water spilled will not get into the litter and be worked over by the birds.

Plans are available from your county agent showing how to build a bell tile type automatic waterer. The use of automatic waterers in the laying house is one of the biggest labor savers on the farm. A flock of 300 hens will require 20 tons of water in one year.

A rack for feeding legume hay to the laying flock through the winter is a most desirable piece of equipment.

Plans for constructing poultry equipment are available in Circular 531, "Homemade Poultry Equipment."

### WINTER FEEDING AND MANAGEMENT

House pullet flocks comfortably in permanent laying quarters by the last of September. If housing is delayed beyond this date, weather conditions are generally less favorable. If the onset of laying has occurred, the changes in surroundings when moved at a later date may disrupt laying and a partial molt result. House early hatched pullets at an earlier date, by the time five eggs are received daily from 100 birds or when production reaches five per cent.

The pullets should be housed separately from older birds. This may be

accomplished in one house by means of a temporary wire partition. If pullets are allowed to mingle with older hens, the possibilities of disease spreading from old hens, that may be disease carriers, to the pullets is greater and consequently results in higher mortality. Older birds also chase pullets from feeders and prevent maximum feed consumption and egg production.

The trend in laying flock management is to house all pullets each fall. In some cases, hens are moved to temporary quarters for production while

egg prices are seasonally high. Market hens as they go out of production.

Overcrowding laying houses causes increased trouble with diseases, lowered egg production and high costs. Three square feet of floor space per bird should be allowed for hens of the light breeds and four square feet for those of the heavy breeds. Thus a 24' x 52' laying house with a feed room would accommodate 400 Leghorns or 300 Rhode Island Reds or other heavy birds.

Give hens in molt access to good laying mash and the same care which is normally given during heavy production.

Pullets frequently molt after laying profitably for two or three months. This may be due to a loss in body weight which sometimes results from heavy production and improper feeding. Make every effort to increase body weight of pullets after housing by allowing the onset of laying to occur naturally and by providing plenty of grain.

The practice of building up litter has become popular with flock owners. Built-up litter simply means that the litter is renewed rather than removed. Here are many advantages: saves labor, lowers litter cost, helps keep the house dry, and the layers do not suffer from cold feet. Shavings, sawdust, coarse ground cobs, chaff or chopped straw, or other litter materials are renewed before becoming soiled enough to require removal. Thoroughly clean the house in late summer. Then as you house the pullets, start with about three inches of litter and add more as needed until

you have 10 inches built up by cold weather. Then just stir and level the litter each week with a rake. Of course, if the litter becomes wet by snow or rain driving in the front of the house, remove the wet portion immediately.

Leave the built-up litter in the house until early summer. Some producers leave it in the house until August when they get the quarters ready for the pullet crop. When this is done only one cleaning is required in a year's time. Manure under droppings pits, of course, will need to be removed more frequently.

### **Principles of Feeding**

Club members cannot expect poultry to return a profit unless they feed their flocks right. Laying hens which receive the right feed for profitable egg production use about two-thirds of it to maintain their bodies. The remaining one-third is used to produce eggs. The hen maintains her body first from the feed she receives. Consequently, you must give your hens plenty of good feed before you can get good egg production. If you don't feed enough, fewer eggs will result because the hen will have less raw materials from which to manufacture eggs.

### **Types of Feed**

There are five general types of feed which must be included in the ration, in addition to plenty of clean, fresh water. These are:

1. **Energy producing feeds** which include: corn, wheat, grain sorghums, and barley.
2. **Protein feeds** which include:

meat and bone meal, super-meat scrap, dried skim milk, dried butter-milk, liquid skim milk, and soybean oil meals. A laying ration should contain a minimum of 15 to 16 per cent protein.

3. **Vitamins** have become increasingly important as more knowledge of the effect upon feeding results has become available.

a. *Vitamin A* is found in yellow corn, alfalfa meal, bright green legume hays, fresh cod liver oil and in green feed. It is necessary for the health of the flock and for a high rate of laying and good hatchability of eggs.

b. *Vitamin D* is found in direct sunlight which has not been filtered through ordinary window glass or through most glass substitutes. It is also present in fish and feeding oils. Vitamin D is necessary for the health of the flock, for high egg production, bone and egg shell formation and hatchability.

c. *Vitamin G or riboflavin* is necessary for high hatchability and maximum egg production. Two common sources of this vitamin are milk and green feed.

4. **Vitamin B<sub>12</sub>** is needed for hatchability. It is found as a by-product of antibiotics, in built-up litter, and in such feed ingredients as fish meal, meat scrap and milk products. It is needed in breeder hen rations. There is little to indicate B<sub>12</sub> is needed in a ration for hens producing eggs for consumption.

5. **Antibiotics** are used in poultry feeds for growing chickens and broilers. Some of the antibiotics being used are penicillin, aureomycin, terra-

mycin and bacitracin. Increases of five to eight per cent in growth rate and feed efficiency can be expected. This will vary as to the type of ration used and amounts of the antibiotic.

Antibiotics have had no effect on egg production, hatchability or adult mortality when fed to laying hens.

6. **Minerals** are quite generally and generously supplied in other feeds. Expensive mixtures of numerous types of chemicals to supply minerals are not necessary and represent useless expense. It is necessary, however, to supply ordinary salt in the feed and to provide oyster shell or finely ground limestone.

7. **Green feed** is desirable in producing hatching eggs, but when other substitutes are provided containing vitamin A and riboflavin there is little to be gained by its use in the production of market eggs.

A good laying mash is a necessary part of a good feeding program throughout the year. Feed mash in a finely ground form so the hen can eat larger quantities and digest it more easily. Mash also serves as a means of including protein, and vitamin carrying ingredients in the ration in proper amounts.

The laying mash and the entire ration must not contain too much bulky feed. Chickens digest concentrated feeds readily. While some bulk is desirable, too much prevents the hen from consuming enough other feeds to produce at the most profitable rate. Use limited amounts of wheat bran or ground oats to provide necessary bulk and certain other valuable nutrients.



The grain ration should be one-half to two-thirds of the total ration. It should be composed of the grains listed as energy feeds. A mixture of these grains, or a single grain may be fed. At least one-third yellow corn is desirable in the grain mixture. Without yellow corn, you'll need to provide green feed or alfalfa meal in the mash, or legume hays. You can provide a complete ration without corn when necessary. Oats may be included in the grain ration but should not exceed one-third the total grain supply.

Gradually make any changes in laying mash rations, grain feeds, or methods of feeding over a period of a week or ten days. Sudden changes of any kind result in reduced feed consumption causing lowered production or temporarily retarded growth.

It is not necessary to buy mill feeds if home-grown grain such as oats and wheat are available. Good heavy oats

can be ground and substituted in place of bran. Wheat can be coarsely ground and substituted in place of the shorts. If yellow corn is not available, you may substitute such feeds as ground barley or kaffir. If such a substitute is made, however, you'll need to add an additional five per cent of alfalfa leaf meal to provide vitamin A. When the alfalfa meal is increased, the bran or ground leaf meal in the ration should be correspondingly reduced.

**Feeding Grain**

Give light pullets a constant supply of grain in open hoppers. They will eat no more than they need, lay equally well and each pullet will have a chance to eat what she needs to maintain body weight. When grain is fed in this manner, additional hopper space, equal to that recommended for laying mash, should be provided.

Heavy breed pullets frequently con-

**Recommended Laying Rations**—Laying rations recommended by the Missouri College of Agriculture are:

	No. 1	No. 2	No. 3
Yellow corn meal .....	200 lbs.	200 lbs.	200 lbs.
Bran .....	165 lbs.	165 lbs.	165 lbs.
Alfalfa leaf meal .....	35 lbs.	35 lbs.	35 lbs.
Shorts .....	195 lbs.	200 lbs.	200 lbs.
Meat scraps .....	75 lbs.	150 lbs.	115 lbs.
Soybean oil meal .....	80 lbs.	.....	.....
Dried whey .....	.....	.....	35 lbs.
Salt .....	7 lbs.	7 lbs.	7 lbs.
Ground limestone .....	15 lbs.	15 lbs.	15 lbs.
Codliver oil or feeding oil .....	2 lbs.	2 lbs.	2 lbs.

(300 Unit D)

Ration No. 3 is suggested for breeding hens.

Codliver oil or feeding oil is necessary only during the winter months beginning in November and ending April 1.

sume too much grain if self fed. It is best to feed grain to the heavier breeds twice daily. Feed one-third of the total amount in the morning and two-thirds at night before roosting time. One hundred pullets will consume about 15 pounds of grain and 7½ pounds of mash each day during the winter months. High producing flocks consume slightly more of both feeds.

Grain may be fed in long V-shaped troughs or hoppers and additional feeding space supplied by spreading it upon the mash in the hoppers.

Where a dry, loose built-up litter is being maintained, some poultrymen feed part of their scratch grain on the litter.

### **Feeding Wet Mash**

In heavy producing flocks, particularly of the light breeds, it is frequently desirable to feed a wet fattening mash at noon each day in order to keep up body weight. If a laying mash is fed, pellets can be used as a noon feeding to increase feed consumption.

Noon feeding of any wet mash is recommended because the purpose of this special preparation of feed is to obtain increased feed consumption of a particular kind. If fed earlier in the day, it tends to merely replace other types of feed which would otherwise be eaten.

Fattening mash may be composed of six parts ground yellow corn, three parts shorts, and one part dried milk. To feed, use water to form a crumbly mash. Liquid milk may be substituted for dried milk and water eliminated in mixing. The mash

should not be sloppy but just enough milk or water added to cause the particles to cling together like bread crumbs.

Temporary and sometimes permanent drops in egg production that usually accompany extremely cold weather may be partly explained by lowered consumption of laying mash and water. Additional attention to the flock during these periods is desirable. Warm the drinking water frequently to maintain normal consumption. Warm wet laying mash may be fed at noon as a means of holding up the amount of mash consumed. This additional attention pays by keeping the hens comfortable and the supply of eggs more constant.

Feeding wet laying mash should be held as a reserve practice for use when cold weather arrives. It may be continued during the winter months, but should be gradually reduced and discontinued by late March or early April. At that season production naturally reaches its peak and continued use of this forcing practice is unnecessary and may prove harmful.

### **Tonics and Conditioners**

The practice of providing tonics and conditioners for the laying flock during the winter months or at any other time is expensive and valueless. Healthy chickens properly fed require none of these and treatment of sick chickens is seldom profitable.

Avoid periodic worm treatments and laxatives. If pullets are actually infested with worms, treat for the type of worms with which they are infested, not for all types. Do this before they are placed in permanent

laying quarters. Treat during the period of most general molt. The practice of indiscriminate worming of all birds, without knowledge of the type of worm infestation, should be discouraged.

A good ration, including a complete laying mash made according to the principles and formulas given in this circular plus grain, oyster shell and a plentiful supply of clean, fresh water are the best assurances for satisfactory production. This type of feeding program combined with comfortable housing and attention to the management details outlined here may be depended upon to produce

satisfactory and profitable results.

### **Coryza (Colds)**

The best insurance against coryza consists of early housing in comfortable quarters free from drafts, dampness, and overcrowding.

Should an outbreak of colds occur, start treatment at once. Treat with sulfathiozole in the drinking water according to directions given on the container. The amount of feeding oil or codliver oil fed should be increased. The oil may be mixed with the mash or a thin stream poured on top of the mash. Continue the feeding oil or codliver oil one week after the sulfathiozole treatment.

## **FEEDING AND MANAGEMENT FOR SUMMER EGG PRODUCTION**

Any well developed, healthy hen or pullet will lay well during the spring months of March, April and May. During the summer months, good egg production will depend upon good management.

Keep the hens in cool, comfortable, well ventilated quarters during the day. Roosting space should be ample to avoid excessive heat during the night.

Keep before them ample supplies of clean fresh water, laying mash and oyster shell.

Grain should be limited to an evening feeding in the case of heavy breed birds or light breeds that are hand fed grain.

Every effort should be made to get the hens to eat large amounts of laying mash. Feed a wet laying mash at noon each day.

Confine the hens within the house

until after the wet mash feeding each day. This keeps the layers near the kind of feed and water necessary for high egg production.

Cull closely to remove the early molting, broody and unthrifty hens as they appear. This practice reduces feed costs, and increases net income.

Lice and mites may seriously reduce egg production. They multiply rapidly in hot weather so examine your flock every two or three weeks for lice. And look at the roosts and other equipment in the house for mites.

Club members that follow these recommendations can obtain satisfactory egg production until late October or early November from the mature flock.

Other management considerations are the same as those discussed under Winter Management.

### Lice and Mites

Lice live on the body of the bird and lay their eggs on the feathers. They multiply rapidly, particularly in warm weather. The nicotine sulfate treatment to rid poultry of these pests is very effective and easily used. "Black Leaf 40" (nicotine sulfate) is spread upon the roosts in a narrow, thin line about an hour before roosting time. Lindane applied at the rate of 13 teaspoons per gallon of water may also be used and sprayed on the roosts. As the hens perch on the roosts during the night, the heat from the body causes a gas from the lindane or nicotine to form. This kills the lice but does not kill the eggs on the birds' feathers. For this reason, you'll need to repeat this treatment in 7 to 10 days to kill the lice that hatch before they mature to lay more eggs.

Sodium fluoride as a dust and in suspension as a dip are also used to control lice. Sodium fluoride powder is dusted on the bird and worked into the feathers.

Dipping in a solution of sodium fluoride is a very effective method of keeping the flock free from lice. If all the birds on the farm are dipped twice a year, the flock can be kept comparatively free of lice. The dip method is useful for pullets under range conditions when housed in buildings which permit too free a circulation of air for successful use of the nicotine sulfate method.

Since dipping must be done on warm bright days, an infested flock should be treated in the fall before cold weather. If the old birds are dipped in the fall before the pullets

are placed in the house, it is often unnecessary to treat the pullet flock. It may be necessary to dip a second time as soon as warm weather permits in the spring.

The dip is prepared by adding one ounce of sodium fluoride powder to each gallon of water. The birds should be held by the wings and the entire body placed under water. The free hand should be used to ruffle the feathers to be sure the solution reaches the skin. Finally the head can be pushed under once or twice and excess material allowed to drain back into the container for a few seconds before releasing the bird.

Sparrows and other birds should not be permitted in the house with poultry, because they frequently bring in both mites and lice.

Mites do not live on the chickens but live in the cracks and crevices about the roosts and nests where they can crawl on to the birds. They may be eliminated by thoroughly cleaning the house, disinfecting it with lye solution and painting the roosts and droppings platform with waste crank case oil.

A dry, comfortable house and sanitation in feeding and watering, combined with healthy stock, is the greatest insurance against parasites and disease losses. It is much easier and less costly than "doctoring".

### Worm Control and Treatment

Control of round worms depends upon sanitation in the use of clean range. When clean range is used, there should be no necessity for worming the pullet stock before

housing in permanent quarters. Adult birds may require a worm treatment at the end of the first year's production. Treatment should be given each individual bird at the time the flock is in a general molt.

If desired, a flock treatment of tobacco dust in the mash may be given. Use tobacco dust at the rate of two per cent in the mash. Feed one or two days, skip 19 days and repeat the treatment.

Tape worms cannot be effectively controlled or eliminated by treatment. Success in preventing a serious infestation depends upon sanitation. The tape worm completes a part of its life cycle in the chicken and a portion in insects such as slugs, flies, etc., upon which the chickens may feed. Clean quarters which reduce the fly hazard will also reduce tape worm infestation.

Before you treat for worms, find out the kind your chickens have. Then treatment may be somewhat effective. Double duty worm pills, combining treatment for both round worms and tape worms, are not recommended.

Round worms are white or yellowish white in color and from two to four inches long. They are round or cylindrical while the tape worm is flat, ribbon-like and made up of sections or segments.

Chickens may have both types of worm at the same time. Treatment, however, should be made for one type of worm and followed with a treatment for the other kind in a week or ten days.

Chickens heavily infested with

worms of either type become thin, light in weight, and have ruffled feathers and a general unthrifty appearance. Paleness of the head, comb and shanks is also characteristic.

Nicotine in some form is recommended for eliminating round worms. There are a number of commercially prepared round worm pills on the market for this purpose.

Common household lye is valuable in holding down tape worm damages. To use this treatment, mix one-half gallon of wheat and one-half gallon of oats and add one rounding tablespoon of household lye that has been previously dissolved in one pint of warm water. Cover this mixture with water and boil slowly for two hours. Avoid scorching the grain by adding a little water from time to time and by stirring the mixture frequently. Drain off water.

Starve the birds for 24 hours before feeding this mixture and withhold water for the last 12 hours of this fast. Place the grain which has been boiled in lye solution before the birds for about two hours. Also, provide water. Two hours before roosting time is an ideal time to feed this mixture. In this way, most of the worm segments will be deposited under the roosts and can be collected and destroyed early the next morning. A second treatment must be given in a week.

Any worm treatment to be effective is somewhat severe. Hens that are laying well do not need treatment and sanitation to prevent infestation is far more important.

**CULLING AND PRODUCTION JUDGING**

Culling begins with the removal of unthrifty young stock. Select pullets for the laying house for size, rate of maturity, health and vigor.

In the laying flock poor individuals should be removed as they appear during all months of the years. However, the greater part of culling is done toward the end of the laying season from July to November.

Proper treatment and good feeding of a flock ahead of the time it is to be culled is necessary. Good hens will appear to be culls if they have not had good feed and care.

One of the first points in culling is to learn the proper way to hold the birds.

Hold the hen in the left hand with the palm upward and fingers extended. Allow the breast bone of the hen to rest on the palm with head pointing toward the elbow. With the extended fingers grip the legs in such a manner that the hen is comfortable. This grip involves placing the thumb and first finger on the outside of the right leg and the second finger between the legs.

A good producing hen has vigorous, strong, healthy appearance and is gentle and friendly. A poor layer is wild or cross.

The eye of a good hen has a bright, alert appearance. The head is broad, and fairly short, with a short, well-curved beak. The entire head has a clean, clear cut appearance in contrast with a dull eye, long narrow, beefy type head found in poor producers. This is shown in Figure 21.

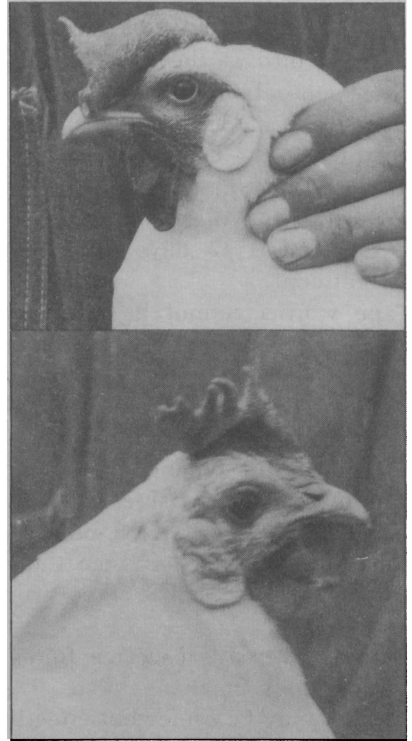


Fig. 21.—Heads of good (above) and poor producers.

Birds with poor heads usually are lacking in other body characteristics. A good hen has a broad back, deep body, and is wide between the legs. Such a bird gives a clean cut appearance, has a full broad chest and ability to turn large amounts of feed into eggs. When handled these good hens have a square, angular feeling to the touch. Hens that lack these good qualities have small rounded bodies that lack depth and width. They are narrow between the legs and have shallow chests that indicate



Fig. 22.—A good producer at the end of laying year. The bare head is quite characteristic of heavy layers.

a lack of vigor. Figure 22 shows a good producer. Notice the full breast, deep, long body, clean cut square head and frayed worn feathers.

### Judging Past Production

The amount of yellow color in the skin, legs and beak of the breed and varieties of chickens that have skin of this color tells a story of past egg production. A bird takes yellow color into her body from yellow corn and green feeds. This color when it does not go into egg yolks, is deposited in the skin. It is most noticeable in the area around the vent and in the beak and shanks. If a hen is laying regularly this color fades away until a bleached or white appearance develops in steadily producing birds. The color first fades in the skin around the vent. The beak starts to fade at the base next to the head and takes 4 to 6 weeks to completely bleach to the tip. The legs bleach more slowly because of thick scales and 4 to 6 months of steady laying is

necessary before all the color disappears.

This fading of color makes it possible to judge past production rather accurately since this color returns during the summer months when the poorer hens slow down or stop laying completely. This information does not apply to chickens of the white skinned varieties such as Orpingtons.

A good producing hen has a soft, loose, velvet-like skin. Her breast bone is fine and the pin bones are thin and flexible. A poor producer has coarse pin bones; is thick skinned and the flesh of the abdomen will feel hard and tight.

The breast bone of a hen which is not in laying condition will be drawn up so there is little distance between the rear end of it and pin bones which will also be close together. A hen in laying condition will show a depth of three to four finger widths between the end of the breast bone and the pin bones, which will also be expanded two or three fingers in width.

### The Molt

The hen uses the same feed to make eggs and feathers. If she starts changing feathers, she slows up or completely stops egg production. Poor producers start molting in the early summer and usually stop laying completely or lay very few eggs. In contrast, the hen that molts in September or October or later completes the task of growing new feathers in about 60 to 90 days. She starts laying again almost as soon as the inferior hen that starts molting during the late June or July months. Early molting hens usually lay at a slower rate than

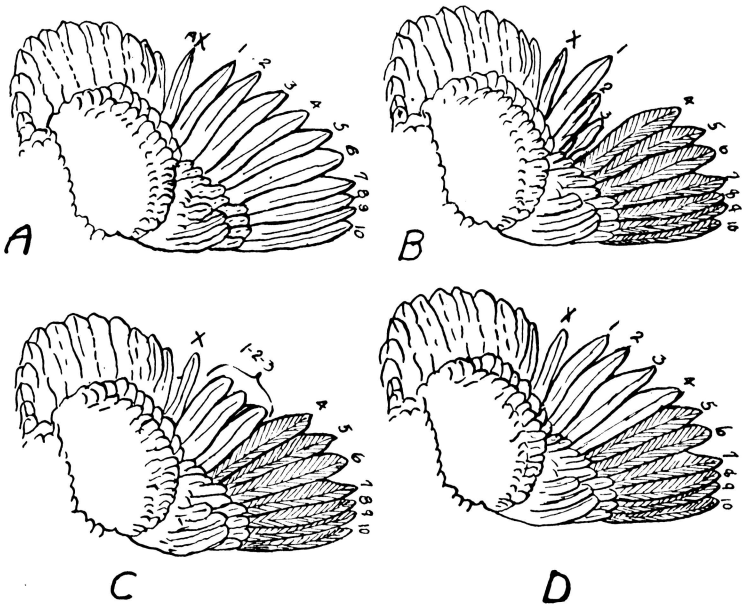


Fig. 23.—(A) Wing with feathers fully renewed. (B) Normal wing molt showing first three primaries in process of replacement. (C) First three primaries molted in a clip. (D) Wing with first four primaries renewed. B molt has been in progress about six weeks. C Three feathers molted at one time, indicating a two or three weeks vacation which started about four weeks previous. D Probably molted in succession in which case vacation started over eight weeks earlier and extended over a period of approximately four weeks. This hen has probably resumed laying.

the fast molters and require more time to complete the growth of new feathers. Consequently they are unprofitable.

The way in which a hen sheds her primary wing feathers makes it possible to estimate how long the molt has been in progress and approximately how much vacation the hen has taken. Figure 23 shows a diagram of a chicken wing divided between primary and secondary feathers. There are 9 to 11 primary wing feathers which are separated from the secondary feathers by a wide feather called the axial feather. This feather is easily distinguished from the pri-

mary and secondary (inner half of wing) feathers because the shaft of the feather divides it into two equal parts. The shaft in the primary feathers is off center and causes the web of the feather to be wider on one side than the other.

Hens that stop laying in July or later usually lose the primary wing feathers closest to the axial feather. For each loss of a primary wing feather it is safe to estimate that a two weeks vacation was taken. It takes about six weeks for a new feather to grow completely. A new feather of this type has a bright pink quill as compared to a white quill in the old



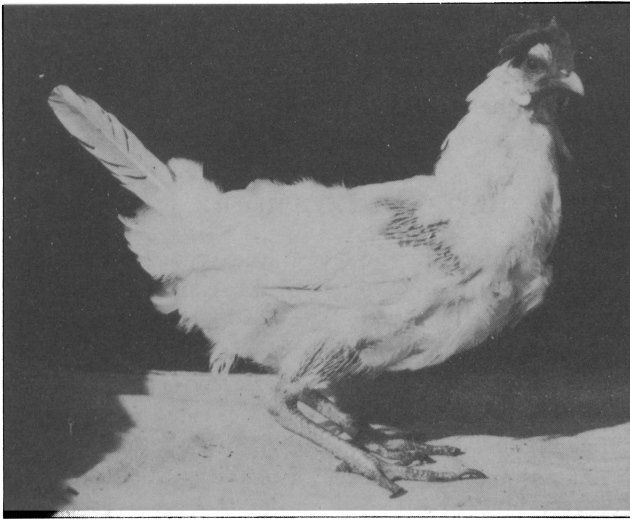


Fig. 24.—Heavy layer in full molt. Picture taken November 1.

ones. These facts make it possible to estimate when the vacation started and by adding two weeks additional vacation for each new feather found, the approximate length of vacation can be determined.

In late molting hens the exception to this general rule is found. These good hens frequently molt two and

three primary wing feathers at the same time. When this occurs the new feathers will grow out at the same rate and the rest period is no greater than had just one feather been dropped.

Figure 24 shows a late molting hen in the process of rapidly growing new feathers.

### Culling Chart

#### High Producers

Strong, healthy, friendly.  
Full and waxy; red.  
Shanks, beak, skin bleached out.  
Velvety, soft skin.  
Pin bones fine.

Abdomen soft, body deep,  
pin bones spread.

Late, fast molter.

1. Vigor
2. Comb
3. Color
4. Quality

5. Condition

6. Molt

#### Poor Layers

Lazy, wild, weak.  
Shrunken, pale color.  
Shanks, beak, skin yellow.  
Coarse, dry skin.  
Breast bone and pin bones thick.  
Abdomen hard, body bones closed up, pin bones close together.  
Slow, early molter.

A temporary upset or a sudden change in feeding can cause molting to occur. For this reason the severity of the molt and the other characters of good and poor hens should be con-

sidered in selecting the good hens from the culls.

The culling chart (page 41) serves as a summary of the characteristics of good and poor producing hens.

### QUALITY EGG PRODUCTION

Many club members have available in their community a graded egg market. Selling eggs on a graded market means selling eggs according to their quality. The club member who takes the best care of his eggs will receive the highest price per dozen. This means making more money on the eggs sold. For pictures of different quality eggs and a guide on marketing quality eggs, project members should get a copy of Circular 621, "Producing and Marketing Quality Eggs", from their county agent.

Practically all eggs are at the top of "Quality Hill" when laid. If you keep the eggs at top quality until you sell them on a graded market, it will mean more dollars for your eggs.

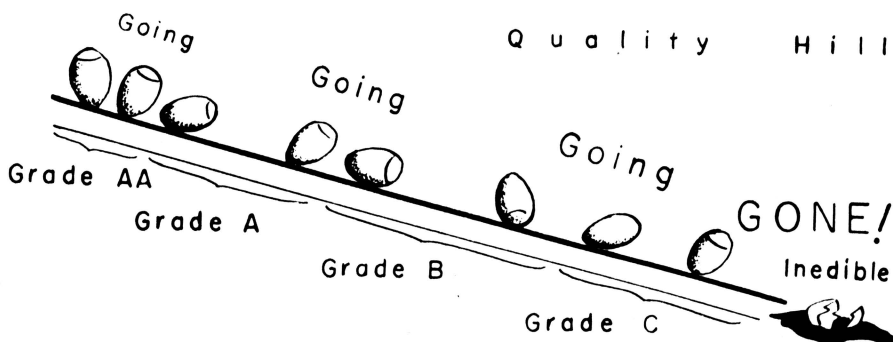
Eggs require the same care needed to keep milk from spoiling. Listed here are the 12 steps you will want to follow to get more money for your eggs.

1. *Gather your eggs three times a day, twice a day in winter. Cool eggs quickly.*

2. *Use wire baskets for gathering and cooling eggs.* The Missouri College of Agriculture has found that eggs cool twice as fast in a wire basket as when in a metal pail, and four times as fast as in a case.

3. *Case eggs the next morning after they are thoroughly cooled.* Case in clean, cooled fillers and cases.

4. *Place in case big end up.* Studies have shown that eggs will grade better when packed "large end up."



### THE QUALITY JOURNEY OF AN EGG

Fig. 25.—Proper care of eggs is essential to maintain quality.

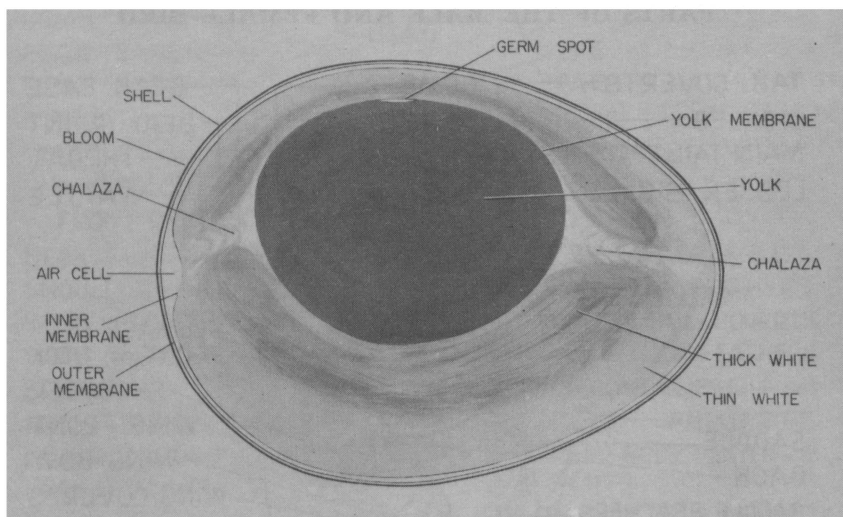


Fig. 26.—Interior parts of an egg.

5. *Hold eggs in a cool, moist place.* Keep them at 60° to 65° F. until marketed. Two of the worst enemies of eggs are dry air and heat.

6. *Market your eggs at least once a week; twice a week, if possible.* Handle them carefully so they will be marketed free of cracks and checks, and with normal air cells. You can get top market prices by selling your eggs while they still have that “fresh laid” quality.

7. *Produce infertile eggs.* Keep all male birds away from the laying flock if you are producing market eggs.

8. *Feed a complete ration.* High quality eggs take plenty of good feed. “Complete ration” means a high quality laying mash, grain, oyster shell or limestone, and clean, fresh water.

9. *Confining the layers until mid-afternoon* will help keep eggs clean in rainy weather. The hens will eat more grain and less green feeds which

will cut down on dark yolks.

10. *Plenty of nests* will help you get clean eggs. One individual nest to each five or six hens, or about the same space in the community type nest. Keep nests supplied with clean nesting material.

11. *Clean all soiled eggs.* Use a brush or emery cloth to clean off small dirt spots. If eggs are not too badly soiled, you can clean them with a warm damp cloth and baking soda or any prepared, smooth cleaning powder—the cake form is best. The best way to clean eggs is to produce clean eggs in the first place.

12. *Get top quality chicks.* Egg size is controlled largely by breeding of the parent stock. So be sure to get chicks from flocks that produce large eggs.

Heredity appears as a factor involved with the number of blood and meat spots found in eggs.

PARTS OF THE MALE AND FEMALE BIRD

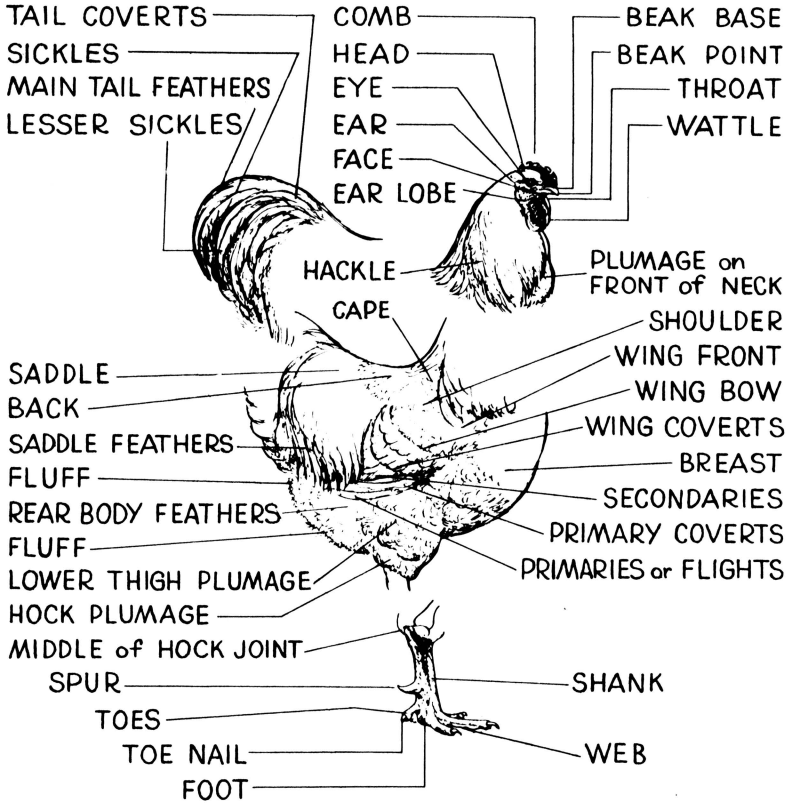


Fig. 27.—Parts of the male.

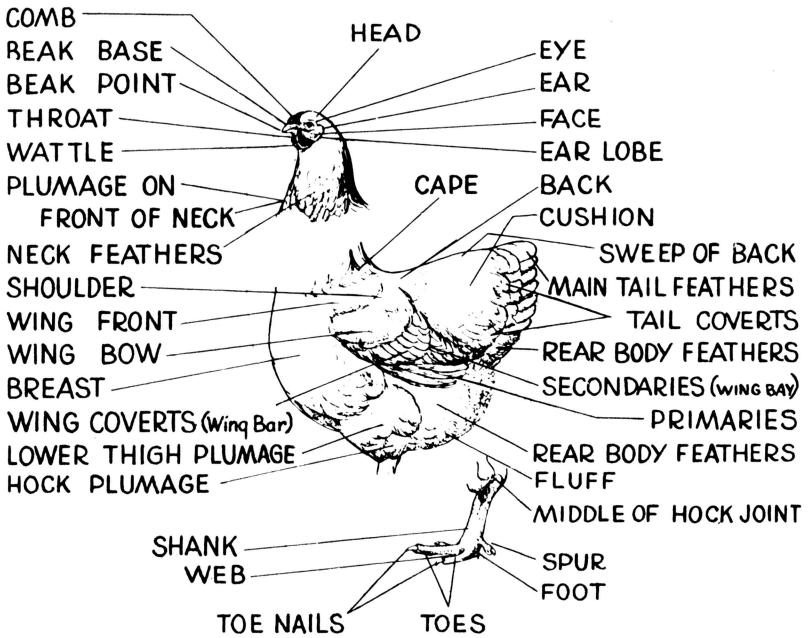


Fig 28.—Parts of the female

**KNOW THE STANDARD QUALITIES**

Poultry project members who expect to do judging in poultry should know the different classes, breeds, and varieties. Class—means where the fowl originated; breed—designates body shape; and variety—gives the feather pattern, feather color, type of comb, and color of skin.

Class	Breed	Varieties	Weight Cock	Per Bird Hen
American	Plymouth Rock	Barred, White, Buff, Silver-Penciled, Partridge, Columbian, Blue	9½	7½
	New Hampshire	Chestnut	8½	6½
	Rhode Island Red	Single Comb Rose Comb	8½	6½
	Wyandottes	White, Silver-Laced, Golden-Laced, Black	8	6½
Mediterranean	Leghorn	White, Buff, Black, Brown	6	4½
English	Orphington	Buff, Black, White, Blue	10	8
Asiatic	Brahmas	Light, Dark, Buff	12	9½

This is only a partial list. If a complete list is desired, see the "American Standard of Perfection".

**POULTRY TERMS A POULTRY PROJECT MEMBER SHOULD KNOW**

Cock	A male bird one year old or more.
Cockerel	A male bird less than one year old.
Hen	A female bird one year or older.
Pullet	A female bird under one year.
Broiler Fryer	A young chicken (usually under 16 weeks of age) of either sex that is tender meated with soft, pliable, smooth textured skin, and flexible breastbone cartilage.
Roaster	A young chicken (usually under 8 months of age) of either sex that is tender meated, breastbone cartilage somewhat less flexible than a broiler or fryer.
Chicks	Young of the hen when in the downy stage.
Capon	An unsexed male bird.
Poult	The young of the domestic turkey before sex can be determined.
Drake	A male of the duck family.
Duck	A female of the duck family.
Gander	A male goose.

**REFERENCES FOR 4-H POULTRY PROJECT MEMBERS**

American Standard of Perfection

Brooder Houses, Missouri Circular 552

Culling for Egg Production, Missouri Circular 516

Growing Broilers, Missouri Circular 623

Homemade Poultry Equipment, Missouri Circular 531

Missouri Poultry Record Report, Missouri Circular 554

Producing and Marketing Quality Eggs, Missouri Circular 621

Sharpen Your Judgment—4-H Circular 85

The Missouri Range Shelter, Missouri Circular 536

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UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE AND THE UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

J. W. BURCH, Director, Agricultural Extension Service

Distributed in furtherance of the Acts of Congress of May 8, and June 30, 1914

**4-H RECORD**  
**POULTRY PRODUCTION**

To be used with 4-H Circular 108, "Poultry Management"



Name \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_ County \_\_\_\_\_

Name of 4-H Club \_\_\_\_\_ Name of Club Leader \_\_\_\_\_

Project Leader \_\_\_\_\_ Junior Project Chairman \_\_\_\_\_

Club meetings attended during year \_\_\_\_\_ Project meetings held \_\_\_\_\_

Number attended \_\_\_\_\_ Number of units in complete project \_\_\_\_\_

Number of poultry demonstrations given at:

Club meetings \_\_\_\_\_, Project meetings \_\_\_\_\_, County meetings \_\_\_\_\_

District meeting \_\_\_\_\_, State meeting \_\_\_\_\_.

Number of times participated in Judging work in:

Project meetings \_\_\_\_\_, Co. \_\_\_\_\_, Dist. \_\_\_\_\_, State \_\_\_\_\_, Interstate \_\_\_\_\_.

Number of exhibits made in:

Community \_\_\_\_\_, Co. \_\_\_\_\_, Dist. \_\_\_\_\_, State \_\_\_\_\_, Interstate \_\_\_\_\_.

Participated in:

County Achievement \_\_\_\_\_, District Round-up \_\_\_\_\_, State Contest Program \_\_\_\_\_,

National Contests \_\_\_\_\_, County Fair or Show \_\_\_\_\_, District Fair \_\_\_\_\_, State

Fair \_\_\_\_\_, Interstate Show \_\_\_\_\_, Marketing Days \_\_\_\_\_, County Camp \_\_\_\_\_,

District Camp \_\_\_\_\_, State Camp \_\_\_\_\_, National Camp \_\_\_\_\_, National Club

Congress \_\_\_\_\_, News stories published \_\_\_\_\_, Radio programs participated in \_\_\_\_\_.

Served on \_\_\_\_\_ Standing Committee.

4-H Activity selected by club for this year \_\_\_\_\_

Brief of club achievements in club activity, health and recreation \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ Year \_\_\_\_\_

Poultry Project Requirements

Young Stock - Obtain not less than 50 baby chicks and develop them to market weight or to maturity.

Broiler Production - Obtain not less than 150 (preferably 500 or more) broiler chicks and market them as broilers.



**Flock Management** - Own and care for or manage in partnership with parents a laying flock from Sept. 1 to Aug. 31 of the next year. Members enrolling in this project for the first time may start any time between Sept. 1 and Jan. 1

**Quality Egg Production** - Gather, store, pack and deliver to a quality market the eggs of a flock for a minimum of 100 days. Ownership is not required. Keep a record that shows the gross egg income and the increase over current price receipts.

Project Goals

**Young Stock or Broiler Production** - My goal for 19\_\_ is to make my pullets weigh \_\_\_\_\_ pounds by Sept. 1 of the year they hatched; and to make broilers weigh \_\_\_\_\_ at 10 weeks, fryers \_\_\_\_\_ pounds at 12 weeks or roasters \_\_\_\_\_ pounds at 4 mo.

**Flock Management** - Obtain an average production of \_\_\_\_\_ eggs per hen for the yr.

**Quality Egg Production** - Get an average of \_\_\_\_\_ cents more per dozen by marketing my eggs on a graded market.

Practices to be Followed

A check mark (✓) in the left hand column shows I plan to do the practice checked. A check in right hand column shows that I did it.

Section I - Young Stock or Broiler Production\*  
Plans for Growing Young Stock or Broilers

I Expect To I Did

- \_\_\_\_\_ Obtain \_\_\_\_\_ baby chicks of U. S. approved or better grade for meat and U.S. certified or better for production..... \_\_\_\_\_
- \_\_\_\_\_ Sell cockerels as broilers and develop the pullets to maturity..... \_\_\_\_\_
- \_\_\_\_\_ Sell all birds as Broilers, \_\_\_\_\_; Fryers, \_\_\_\_\_; Roasters, \_\_\_\_\_.
- \_\_\_\_\_ Brood chicks in a combination brooder and range shelter..... \_\_\_\_\_
- \_\_\_\_\_ Brood chicks in a 10' x 12' brooder house or 20' x 20' house..... \_\_\_\_\_
- \_\_\_\_\_ Use a \_\_\_\_\_ (wood, coal, oil, or electric) brooder stove..... \_\_\_\_\_
- \_\_\_\_\_ Keep my project birds separate from other birds on home farm..... \_\_\_\_\_

Brooding

- \_\_\_\_\_ Scrub brooder with lye water if it has been used before..... \_\_\_\_\_
- \_\_\_\_\_ Heat brooder 24 hours before arrival of chicks..... \_\_\_\_\_
- \_\_\_\_\_ Put clean litter on the floor..... \_\_\_\_\_
- \_\_\_\_\_ Handle chicks carefully when they are placed in the brooder..... \_\_\_\_\_
- \_\_\_\_\_ Put a guard around the brooder stove (if a stove is used) to confine chicks to heated area..... \_\_\_\_\_
- \_\_\_\_\_ Keep temperature 95° F. for first week; lower 5° a week till down to 70°..... \_\_\_\_\_
- \_\_\_\_\_ Keep birds confined or move to clean range..... \_\_\_\_\_

Feeding Chicks

- \_\_\_\_\_ Feed starting mash as soon as chicks are placed in brooder..... \_\_\_\_\_
- \_\_\_\_\_ Feed broiler mash if I am raising broilers..... \_\_\_\_\_
- \_\_\_\_\_ Prepare a starting mash or broiler mash using a formula recommended by the Missouri College of Agriculture..... \_\_\_\_\_
- \_\_\_\_\_ Buy a good commercial starting mash or broiler mash..... \_\_\_\_\_
- \_\_\_\_\_ Feed mash in feeders allowing one 3-foot chick feeder for each 50 chicks to three weeks..... \_\_\_\_\_
- \_\_\_\_\_ Increase feeder space 50 per cent and use larger feeders from three to eight weeks..... \_\_\_\_\_
- \_\_\_\_\_ Continue broilers or fryers on broiler mash until marketed..... \_\_\_\_\_
- \_\_\_\_\_ Change pullets to growing mash and grain at eight weeks..... \_\_\_\_\_
- \_\_\_\_\_ Keep plenty of fresh water before birds at all times..... \_\_\_\_\_

\*Project members enrolled in the Young Stock project or Broiler Production will use only Section I of this Record. Those enrolled in Poultry Flock Management will start with Section II but will refer back to Section I for that part of Poultry Management that has to do with growing pullet stock.

Summer Management of Young Stock  
(Pullets for replacement)

<u>I Expect To</u>	<u>I Did</u>
_____ Use clean range.....	_____
_____ Provide range shelter at rate of one sq. ft. for each bird.....	_____
_____ Provide ample feeders for grain and mash; place in limited shade.....	_____
_____ Locate a water fountain in a shady place.....	_____
_____ Separate cockerels from pullets when brood is 8 to 10 weeks old.....	_____
_____ Vaccinate pullets with chicken pox vaccine at 8 to 12 weeks old.....	_____
_____ Cull pullets undesirable for layers and market for meat.....	_____

Completing the Record on Young Stock or Broilers

_____ Estimate the value of pullets on hand.....	_____
_____ Total value of birds sold.....	_____
_____ Calculate feed, equipment, brooding and other costs and transfer same to the financial summary in this Record Book.....	_____

Section II

Flock Management and Quality Egg Production Projects

_____ Continue with pullets developed in the Young Stock project and handle them as a separate enterprise on the farm.....	_____
_____ Take over by purchase a flock of hens.....	_____
_____ Enter into a partnership with my parents whereby I manage the home flock and share in the income according to a definite agreement entered into between me and my parents.....	_____
_____ Provide comfortable house, 20 ft. or more deep, straw loft, open front.....	_____
_____ Allow 3 sq. ft. of floor space for light weight birds and 4 sq. ft. for heavy weights	_____
_____ Provide one clean nest for every 4 to 5 birds in flock; or one two-story 2 x 5 foot community nest for 100 hens.....	_____
_____ Provide 8 inches of roosting space for every bird and arrange roosts over a droppings pit.....	_____
_____ Put down thin section concrete floor in laying house, or have a well drained out floor.....	_____
_____ Use built-up litter.....	_____

Winter Management

_____ Hopper feed laying mash and feed grain in hoppers or troughs.....	_____
_____ Keep green alfalfa hay before the birds at all times.....	_____
_____ Keep oyster shell before the birds at all times.....	_____
_____ Provide plenty of water at a temperature above 50°F.....	_____
_____ Keep the birds free of lice.....	_____
_____ Keep the house free of mites.....	_____
_____ Use electric lights.....	_____

Care of Eggs

_____ Keep nests clean.....	_____
_____ Gather eggs three times a day in the summer.....	_____
_____ Cool the eggs before placing them in an egg case.....	_____
_____ Pack eggs with the big end up.....	_____
_____ Store eggs in a cool humid place.....	_____
_____ Produce infertile eggs when not producing eggs for hatching.....	_____
_____ Market eggs once a week in winter and twice a week in summer.....	_____

Summer Management

_____ Yard or confine laying flock.....	_____
_____ Cull out producers regularly every month or at least twice during summer and early fall.....	_____

I Expect To

I Did

- \_\_\_\_\_ Keep feed, water and oyster shell before birds at all times..... \_\_\_\_\_
- \_\_\_\_\_ Control lice and mites..... \_\_\_\_\_
- \_\_\_\_\_ Keep egg and feed records on forms provided by the Poultry Department of the  
Missouri College of Agriculture..... \_\_\_\_\_
- \_\_\_\_\_ Sell eggs on a graded basis..... \_\_\_\_\_

Note: Refer to Section I for the subjects of Brooding, Feeding Baby Chicks and Summer Management of Young Stock. Quality Egg Project members check that part of Section II.

Financial Summary

Young Stock or Broiler Production

Cost of baby chicks..... \_\_\_\_\_

Cost of feed..... \_\_\_\_\_

Cost of brooding..... \_\_\_\_\_

Other costs..... \_\_\_\_\_

Total Costs..... \_\_\_\_\_

Value of stock on hand September 1..... \_\_\_\_\_

Received from sale of market birds..... \_\_\_\_\_

Total Receipts..... \_\_\_\_\_

Poultry Flock Management

Gross income from flock for the year..... \_\_\_\_\_

Cash expense..... \_\_\_\_\_

Income less expense..... \_\_\_\_\_

Average production per bird..... \_\_\_\_\_

Labor income per bird..... \_\_\_\_\_

Quality Egg Production

Number of hens (beginning of project \_\_\_\_\_ Length of project \_\_\_\_\_  
(finishing of project \_\_\_\_\_)

Eggs sold on graded market (dozens) \_\_\_\_\_ Average price per dozen \_\_\_\_\_

Total dollars received for graded eggs sold ..... \_\_\_\_\_

Local market price for unclassified egg (per dozen)..... \_\_\_\_\_

Difference in unclassified and graded price (per dozen)..... \_\_\_\_\_ cents

Total added income from selling graded eggs..... \_\_\_\_\_ dollars

Signed \_\_\_\_\_

Date Record is submitted \_\_\_\_\_

UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE AND THE UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

J. W. BURCH, Director, Agricultural Extension Service

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