A Manual for 4-H

POULTRY CLUB MEMBERS

Circular 452

UNIVERSITY OF ILLINOIS • COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION AND EXTENSION
SERVICE IN AGRICULTURE AND HOME ECONOMICS
# CONTENTS

ILLINOIS PLAN FOR 4-H POULTRY CLUB WORK ........................................... 1

FUNDAMENTALS OF POULTRY PRODUCTION AND MANAGEMENT ........................................ 5
  Chick Rearing Suggestions ................................................................. 5
  Summer Care of Pullets ................................................................. 10
  Selecting the Laying Flock .............................................................. 13
  Housing, Management, and Feed for the Laying Flock .......................... 16
  Marketing of Meat and Eggs ............................................................ 21
  Selecting and Preparing Birds for the 4-H Poultry Show ....................... 24
  Poultry Diseases ............................................................................. 26
  External Parasites of Poultry .......................................................... 30

This material has been prepared by H. H. Alp, Extension Specialist in Poultry Husbandry, and E. I. Pilchard, Extension Specialist in Junior Club Work.
The Illinois Plan for 4-H Poultry Club Work

TO ILLINOIS FARM BOYS AND GIRLS poultry club work offers many benefits and satisfactions. It offers a challenge to do something worth while, the association with other members and with leaders of the projects, the experience that can be utilized later if one decides to take up poultry production and management on a larger scale, and the opportunity, when the projects are carefully planned and executed, of realizing some revenue from them.

Poultry club work has been widely taken up by 4-H club members in Illinois because it fits so well into the farm program in practically all sections of the state. In some of the counties of southern Illinois, 20 percent of the farms receive 40 percent or more of their total income from poultry. The total value of poultry products in Illinois, including chickens, ducks, geese, turkeys, and chicken eggs, was more than 6 million dollars in 1930, according to the U. S. Census.

Two types of projects are included in the Illinois plan for poultry club work: (1) ownership projects and (2) partnership projects. On farms where poultry is a side line a 4-H club member may have full ownership of his flock. He may be given a special yard and perhaps a different breed from that kept by his parents. On other farms where the sale of poultry and poultry products contributes an important part to the farm income, a member may be given a share in the proceeds in return for his care and management of the flock.

As soon as you have decided to take up poultry club work, study carefully the project plan and start with that phase of the work that best fits your farm situation and for which your experience and ability are best suited. After a year of experience in your first poultry project, you will know whether you wish to continue with further club work in this field. If you decide to continue, you should plan a program that will cover two or three years and will at the end of that time give you a business of your own.

The Illinois plan for 4-H poultry club work is outlined on the next two pages. The rest of this Manual is devoted to explaining the fundamentals of poultry production and management.
Project 1—Chick Brooding

Object—Production of birds for starting a flock, or production of market birds.

a. Ownership

Number—75 or more hatching eggs, or 50 or more baby chicks.

Stock—Standard-bred. It has been found advisable to limit the breeds to those found most commonly on Illinois farms: White Leghorns, White Plymouth Rocks, Barred Plymouth Rocks, Rhode Island Reds, and White Wyandottes.

Source—Local standard-bred flocks if possible.

Age of chicks—Hatched before May 1.

Starting date for project—Not later than May 1.

Records—Should be started when eggs or chicks are secured. Use ILLINOIS 4-H RECORD BOOK FOR POULTRY PROJECTS.

Exhibit—Limit: 2 in each class. Single classes: cockerel, pullet. Pen classes: 1 cockerel and 3 pullets.

b. Partnership

Number—300 or more baby chicks.

Care and management—The club member must be responsible for all care and management of that unit of the poultry enterprise which is included in the club project.

Returns to members—Ten percent of the gross market value of the chicks raised during the project. Arrange for payment at the time sales are made. Final settlement should be made at the end of the project on the market value of the remainder of the flock in the club project.

Other requirements—Same as for ownership project above.

Project 2—Egg Production

Object—Production of eggs for market.

a. Ownership

Number—12 or more pullets.

Stock—Same as for chick brooding project above.

Source—Pullets selected from chicks produced in club project the previous year or from local flock.

Starting date for project—Not later than October 1.

Records—Must be started not later than October 1. Use ILLINOIS 4-H RECORD BOOK FOR POULTRY PROJECTS.

Exhibit—Minimum exhibit of two dozen eggs to be made at the local or county show. Eggs to be judged on interior as well as exterior quality.
b. Partnership

Number—100 or more birds.

Care and management—The club member must be responsible for all care and management of that unit of the poultry enterprise which is included in the club project.

Returns to members—Ten percent of gross receipts from laying flock from starting date until project is completed.

Other requirements—Same as for ownership project above.

Project 3—Breeding and Flock Management

Object—Development of a high-producing flock thru selection and breeding.

a. Ownership

Number—12 or more pullets and 1 or more cockerels.

Stock—Standard-bred, high-producing birds. It has been found advisable to limit the breeds to those found most commonly on Illinois farms: White Leghorns, White Plymouth Rocks, Barred Plymouth Rocks, Rhode Island Reds, and White Wyandottes.

Source—Carefully selected birds from the chick-brooding project or from local flocks.

Starting date for project—Not later than October 1.

Records—Must be started not later than October 1. Use ILLINOIS 4-H RECORD BOOK FOR POULTRY PROJECTS. Breeding and hatching records should be kept.

Exhibit—Limit: 2 pens per member. Breeding pen: 1 male and 3 females.

b. Partnership

Number—100 or more birds.

Care and management—The club member must be responsible for all care and management of that unit of the poultry enterprise which is included in the club project.

Returns to members—Ten percent of the gross market value of all poultry and poultry products produced in the project.

Other requirements—Same as for ownership project above.
FIG. 1.—HEALTHY PARENT STOCK IS ESSENTIAL FOR GOOD CHICKS

The first consideration in fighting disease or parasites in poultry should be in breeding stock of vigor and vitality.
CHICK REARING SUGGESTIONS

Selection and Housing

Select chicks carefully. A good start in any endeavor is a big step toward achieving success. In poultry production a good start begins with the selection of good chicks. In order to select good chicks one must have some knowledge of the parent flock, their present and past health, breed characteristics, rate of growth and feathering as young birds, and the type and condition of male birds used.

Early-hatched chicks preferable. Early-hatched chicks, that is, chicks hatched between March 15 and April 15, are usually the most satisfactory. Temperatures at this time of year, because less variable, are generally more favorable for brooding. Pullets hatched in this period will begin laying early in the fall and cockerels can be sold to advantage on the early market as broilers. Such breeds as Leghorns may be hatched somewhat later than the heavier breeds.

Avoid overcrowding in brooder house or coop. A brooder house or coop for young chicks may vary considerably in construction and still be satisfactory if it provides plenty of room. If the chicks are reared with a brooder stove, a suitable room or house is necessary. A room 10 by 12 feet provides space for 350 chicks. Though more chicks may sometimes be cared for successfully in a room of this size, the dangers that come with overcrowding are too great to advise it. It is equally important to avoid overcrowding when chicks are being brooded with hens in coops.

A portable house aids in sanitation, since it can be moved from place to place and the chicks can be grown on a different patch of ground each year. The house must have plenty of ventilation if the chicks are to develop properly. The floors must be tight in order to keep the chicks warm and dry.

Clean, well-drained location needed for house or coop. Every club member will need to be on the alert to prevent disease from getting started in his flock. One of the best safeguards is to locate the house or coop on a clean range free from contamination with poultry manure. A wet, poorly drained range should be avoided.
For further suggestions for prevention of disease outbreaks, see the control recommendations in the section on *Poultry Diseases*, pages 26 to 30.

**Simple poultry equipment usually adequate.** The equipment needed for starting a poultry project can usually be made in the home workshop. The most important item is the feed hopper.

![FIG. 2.—A HILLSIDE MAKES A CLEAN RANGE](image)

Because of the natural wash off, a good slope usually results in a clean poultry range.

For the chick project, feeders of three different sizes should be made. In making a feeder, keep in mind simple construction and the number of chicks to be accommodated. Much time and money have been wasted on elaborate feeders which have proved impractical.

The simple lath feeder is quite satisfactory for the first three weeks, and if made 4 feet long will accommodate 100 chicks. Later a larger feeder will be necessary, and for range feeding an all-weather outdoor feeder is recommended.

**Drinking equipment is the next most important item.** If plenty of good drinking water is to be always available to the chicks without the expenditure of an excessive amount of labor, attention must be given to the size of the container. A glass fruit jar, unless used for only a short time when the chicks are small, is not usually satisfactory. A wooden keg with a spigot is excellent. It will hold a day's water supply and can be kept clean and so adjusted as always to provide the right amount of water dripping in a trough or pan.

*For detailed building instructions and illustrations of feeders and roosts, see your club library copy of Illinois Circular 333, "Poultry Farm Equipment."
FIG. 3.—A WIRE FLOOR PORCH IS A SUBSTITUTE FOR CLEAN GROUND

Wire porches are very useful in connection with brooder houses that cannot be moved to clean range. To cover the floor, $\frac{1}{2}$-inch mesh hardware cloth is commonly used.

FIG. 4.—AN EXCELLENT HOMEMADE WATERING DEVICE

A barrel or keg with a spigot adjusted to regulate the water supply will provide plenty of water throughout the day. The wire platform is very much worth while in keeping the area clean where the birds are drinking.
Roosts should be installed in every brooder house while the chicks are still quite small. They are essential for encouraging early roosting. Very few people think to provide them.

Feeding Methods and Feeds

Feed for growth. The important thing to remember in feeding chicks is that you are feeding for growth, and that for growth chicks must always have plenty to eat. Chicks suffer more often from too little feed than from too much.

Any laxity or carelessness in the method of feeding is also sure to result in poor growth. Small, runty chicks are frequently the result of careless feeding, as are also many of the losses among early chicks. Careless feeding is evidenced by empty feeders and watering pans, too few feeders, dirty feeders, and feeding from dirty floors and dirty range.

Good feed will result in good growth only when it is fed in adequate amounts and is accompanied by the right care and good sanitation.
Most recommended feeds are satisfactory. A satisfactory feed mixture for chicks is easy to obtain. Suitable feeds range from the simplest corn-meal and milk ration to complicated mixtures of many ingredients.

Good growth has been obtained from both commercial and homemade mixtures. Very little difference is evident in the results from the two feeds. Some flock owners are able to keep their cash outlay for feed low by using home-grown grains.

A good chick-starting feed (all parts by weight) includes:

- Ground yellow corn .................. 55 parts
- Ground wheat .......................... 15 parts
- Finely ground oats .................. 10 parts
- Meat scrap .......................... 14 parts
- Dried milk .......................... 5 parts
- Salt .................................. 1 part

100

This mixture is only one of many that might be used. One of its advantages is that it contains the grains usually available on Illinois farms. The excellent results from its use justify its recommendation.

Feeding grain. Whether it is desirable to feed grain to chicks depends largely on the method of feeding being used. The all-mash system, as the name implies, makes grain feeding unnecessary.

There is little reason, however, for not feeding grain rather liberally after the first six weeks. The use of grain is both logical and advisable on most Illinois farms. A satisfactory practice is to feed it free-choice in hoppers along with the regular mash. Equal parts of cracked corn and wheat make a suitable mixture. Cracking the grain may be stopped as soon as the chicks are large enough to eat the whole grain.

There is no definite rule for deciding when grain should first be fed or the quantity to be used. The one point on which most poultrymen agree is that with the average mash mixture given to chicks little grain should be fed during the first few weeks.

Vitamins and minerals easily supplied. Vitamin deficiencies are not likely to occur when farm-raised chicks are allowed to run out in the sunshine, are fed a ration of natural feeds, and have access to a liberal supply of fresh green feed. A small box of grit or sharp, fairly fine sand, and a small box of chick-size oyster shell are the only additional minerals needed. Cod-liver oil or sardine oil is necessary only when chicks are being brooded in close confinement. When one of these oils is required, a pint to 100 pounds of mash will usually be sufficient.
Medicinal feeds, minerals, and commercial "pills" and "powders" are unnecessary in a chick's diet. The value, if any, of such material is usually greatly overrated. Cleanliness, good management, and wholesome feed should accomplish the desired results without the use of commercial minerals and medicines.

**SUMMER CARE OF PULLETS**

**Sanitation Necessary to Prevent Disease Losses**

The good work accomplished thru early brooding and rearing is often undone by carelessness in management during the summer period. The importance of keeping the places clean where the flock eats and roosts cannot be overemphasized.

Worms and coccidiosis become troublesome only when feed, water, and the house and yard become contaminated with filth and an accumulation of poultry manure.
Move range feeders frequently. A clean "tablecloth" can be provided very easily by moving the range feeders weekly, tho they need be moved only a few feet each time. The chief source of contamination of feed is the ground around the feeders when it is badly tramped and filthy with droppings.

FIG. 7.—A GOOD RANGE HELPS TO GROW HEALTHY PULLETS

Ground over which poultry has not run for a year or two is desirable range as it aids in keeping pullets free from parasites and diseases. The range feeder in use above also helps to insure clean feed.

Clean around the "front door step." The dirtiest place usually found around a poultry house is the area within about 15 feet of the house. When the house cannot be moved, this area should be raked and swept regularly, and possibly disked.

Protect drinking water from contamination. Many of the disease organisms and parasites of poultry are undoubtedly spread chiefly thru contaminated drinking water. The simplest way of avoiding contamination is to mount the trough or pan on a wire-topped platform. The common ¼-inch-mesh hardware cloth makes a very satisfactory wire to use for this purpose.

Wash and Spray Brooder House and Coops

A mixture of water and household lye is recommended for washing out brooder houses, coops, and feeder equipment. The lye, when used
at the strength of 1 pound to 10 gallons of water, helps to soften the dry caked manure and straw and to destroy the thick, protective coverings of parasite eggs, such as are found on worm eggs.

Following a thorough washing, the house or coop should then be sprayed with some recognized disinfectant, such as a compound solution of cresol. This is an efficient disinfectant when used at the rate of at least 4 ounces to each gallon of water.

**FIG. 8.—** SOME SHADE FOR POULTRY IS DESIRABLE

During extremely hot weather outdoor feeders should be moved frequently enough to prevent the accumulation of filth around the feeders. They should also be placed where they will give some protection from excessive heat.

**Provide Shade During Hot Weather**

Some shade should be provided for poultry during extremely hot weather. Corn and sunflowers planted in strips near brooder houses provide an excellent type of shade. Allowing the pullets to range in a cornfield is probably one of the most practical ways of providing shade and a satisfactory range on Illinois farms. It is generally not a good practice to allow the pullets to range underneath the brooder house, because often this area becomes contaminated with disease organisms and parasites and is then a real source of disease infection.
SELECTING THE LAYING FLOCK

The value of production judging—that is, the judging of a bird by the body characteristics that are supposed to indicate good egg production—has been somewhat overemphasized, but the practice is extremely worth while when one has some knowledge of the breeding history and management of a flock.

How to Hold Poultry for Selection or Judging

To become proficient in judging or selecting poultry, one must first know how to hold a bird. Failure at this point is a serious handicap to the correct judging of any bird and may be one reason for poor judging in a judging contest.

Unless you are left-handed, hold the bird in your left hand, with the keel bone resting on the palm of your hand. Extend your forefingers between the legs of the bird and hold it firmly enough to prevent it from getting free, yet do not cause unnecessary struggling by pinching. By holding the bird in this manner you can inspect it in its normal posture.

Practice this method until you are thoroughly familiar with it.

Characteristics Indicating High Egg Production

In order to lay well, a hen must be vigorous and healthy and have a sound body. Vigor and health are indicated by bright, clear eyes, a well-developed body, and an active disposition.

Clean-cut, well-balanced head. The head of the good layer is usually clean-cut, well balanced, and of medium length and depth. The eyes are large and prominent. The bird that tends to be thick or coarse about the head is apt to be a poor producer.

Wide back and deep body. The back should be wide over its entire length and free from hard fat. A narrow spring of ribs or a back that tapers decidedly or slopes sharply to the rear indicates small capacity. The back line should be approximately straight, and the underline should be nearly parallel with it.

The body should be deep. Use care not to confuse birds that appear deep because of long, loose feathering and birds that have actual body depth. Measure depth by placing the thumbs on the middle of the back, the little fingers on the front end of the keel, and the middle fingers on the rear of the keel bone. Measure depth of

Adapted in part from suggestions on production judging formulated at the annual judging school held at Cornell University, Ithaca, New York. 1935.
front and rear by spanning the body from back to breast with the thumb and middle finger and sliding them along the keel and back.

Changes in body character. A laying hen has a large moist vent which is wide and dilated in contrast to the small, dry puckered vent of a hen that is not laying. Fat goes out of the body with production, so that the heavy producer has a soft, pliable skin. The comb, wattles, and ear lobes of a bird that is laying heavily are large, full, plump, smooth, and waxy. If the comb is dried down, especially at molting time, the bird is not laying.

Color or pigmentation changes. Color changes should be observed by daylight. In yellow-skinned breeds the different parts of the body become white or bleached, according to the length of time the bird has been laying. All color changes in yellow-skinned breeds are dependent on health, management, feed, coarseness of the skin, and size of the bird. The changes occur in the following order:

The vent changes very quickly with egg production so that a white or pink vent on a yellow-skinned bird generally means that the bird is laying, whereas a yellow vent means that the bird is not laying.

The eye ring, that is, the inner edge of the eyelids, bleaches a trifle more slowly than the vent.

The beak loses color first at the base, the color gradually disappearing until it finally leaves the front part of the upper mandible. On the average yellow-skinned bird, a bleached beak means that the bird has been producing for at least the preceding four to six weeks.

The shanks are the last to lose color and hence if bleached indicate a long previous period of production. The yellow color goes first from the scales on the front of the shanks and finally from the scales on the rear. A bleached shank usually indicates production for at least the previous eight to twenty weeks.

Molting of Primary Feathers in Wing

The manner in which a hen molts her primary wing feathers indicates the amount of time she has been on vacation and the progress of the molt. There are usually ten to eleven primary feathers, and these feathers are separated from the secondary or smaller feathers (inner half of wing) by a small feather known as the axial feather.

When a hen quits laying, she usually first drops the inner primary feather, or the one next to the axial feather. If she remains out of production for two or three weeks after the dropping of the first feather, a second primary feather will be molted and so on until the whole wing is molted. To determine how long a bird has been
molting, allow six weeks' time for the first full-grown primary feather and about two weeks for each succeeding mature feather.

**FIG. 9.—A TELL-TALE WING**

When a hen quits laying, she usually drops the inner primary feather, which is the one next to the axial feather. The arrow points to the center, or axial feather, between the secondary and primary feathers, the secondary feathers being the inside section of the wing. To determine how long a bird has been molting, allow six weeks' time for the first full-grown primary feather and about two weeks for each succeeding mature feather. The primaries molted on the above bird indicate that she has been out of production for about 6 to 8 weeks.

**Selecting Pullets for Laying**

It would, of course, be unfair to apply some of the measures used in determining past egg production to birds which have not started to lay. For example, one would usually expect a pullet to have yellow shanks, good weight, and feathers of good sheen.

In selecting pullets, first consider health, body development, and trueness to breed types. Birds showing lack of maturity or lack of physical fitness are, as a rule, poor risks as winter layers.
There is no way to measure exactly the future egg-laying capacity of a pullet that has not started to lay. If she is a well-bred, healthy specimen and receives proper treatment, she may be accurately evaluated as an individual producer at the end of her first laying year.

**Culling**

As applied to poultry the term culling should be thought of as the sorting out from the flock of the birds that are physically unfit for breeding, egg production, or market. A true cull will have no commercial value.

**HOUSING, MANAGEMENT, AND FEED FOR THE LAYING FLOCK**

**Comfortable Housing Means Higher Egg Production**

To secure high egg production in the fall and winter in Illinois, comfortable housing conditions must be provided for the laying flock. To be adequate a house should provide 4 square feet of floor space to each bird, should be free from dampness and draftiness, and should give the birds protection against extreme temperatures.

**Repair and construction of houses.** Dilapidated poultry houses seriously reduce the efficiency of a flock. A little time spent with a hammer and saw will often do a great deal towards improving a neglected poultry house. Broken windows, poorly hung doors, roosts...
without droppings boards, leaks in the roof, loose boards on the walls, and broken nests and feeders are some of the items most commonly in need of repair.

Club members who are interested in new construction or in the remodeling of an old house may obtain directions for building by writing to the College of Agriculture, Urbana, Illinois, or by referring in their club library to Illinois Circular 412, "Directions for Building the Straw-Loft Poultry House" or to Illinois Circular 368, "Directions for Building Illinois Shed-Roof Poultry House."

![Figure 11](image)

**FIG. 11.—OUTDOOR RANGE SHOULD BE LIMITED TO CLEAN GROUND**

An outdoor range for laying hens should be kept sanitary. Frequent cultivation is the most practical way to kill disease organisms.

Inexpensive separate housing for a club flock can also be provided by constructing a straw poultry house. Such houses have been built in Illinois to accommodate 100 birds at a cost of $3 and have been satisfactory for a period of one to two years.

**Poultry house equipment.** The most important pieces of housing equipment are nests, feeders, drinking stands, droppings boards, and roosts. There should be at least one nest for every six hens, 8 to 10 inches of roosting space per bird, and 1 foot of mash hopper space for every five birds.

**Fall and Winter Egg Profits Depend on Good Management**

Fall and winter egg sales usually offer a 4-H club member his best chance to secure a high cash income from his poultry project.
If the pullet has the breeding required for winter laying, has been well grown, and is housed in suitable quarters, then the securing of good egg production depends almost entirely on the club member. It will involve a great deal more than merely providing a balanced ration, essential as good feed is. It will mean attention to time of housing, to sanitation, and to regularity in the routine of feeding and management, as discussed on the following pages.

**Early housing necessary for early laying.** The housing of pullets in winter quarters early in September insures early laying. It is a common mistake to allow pullets to remain on range without confinement to the laying house long past the period in the fall when they should be in their winter quarters. Late housing of pullets usually causes delayed winter production, which means an unsatisfactory performance during the early part of the winter season when prices are usually highest. Late housing may possibly cause some molting.

**Cleanliness in and around the laying house.** Failure to change the litter frequently and to keep the feeders and waterers clean often causes disease outbreaks shortly after housing.

**Regularity in routine of feeding and management.** Irregularity in feeding and management, probably more than anything else, is responsible for many of the disappointments experienced in poultry production. If different people look after the laying flock, or if the feed or the feeding hour is changed, serious losses in production are likely to occur.

The importance of regularity in feeding is well illustrated by what happened to a commercial poultryman during a recent winter production season. His flock of 2,000 Leghorn pullets were laying exceptionally well, and he had established a market for the eggs at a premium price. One afternoon while he was on a trip to town for feed his truck broke down and because of the delay in getting it fixed, he was unable to be home at the regular feeding hour. The resultant irregularity in feeding caused such a serious loss in production that he stated he would have been money ahead if he had left his truck on the side of the road, gone to town and bought a new one, and gone home and fed his birds at the usual time. Once a routine system of management has been worked out every effort should be made to follow it closely, at least during the winter season.

**Plenty of mash hoppers.** A good feed mixture is of little value unless there are plenty of feeders from which to feed it. A common recommendation is 20 feet of feeder space for 100 birds. A feeder 10 feet long which permits the birds to eat from both sides would meet this requirement.
Plenty to drink. For a hen to lay well she must have at all times a clean supply of water to drink or milk if milk is being used. So important is water or milk that some means should be devised whereby it can be artificially heated during cold weather in order to be constantly available. Lack of water early in the morning or late in the evening, or during the night should lights be used, will result in a very unsatisfactory egg production.

Artificial lighting. Artificial lighting is often resorted to during late fall and early winter as a means of increasing or holding production. If electricity is available, the necessary lights can easily be provided. The method of lighting may vary; a combination of morning and evening lights, of morning or of evening lights alone, or all-night lights may be used.

The all-night lights are probably the easiest to use and the most satisfactory for club members wishing to try artificial lights. For rooms measuring 20 by 20 feet a 15-watt bulb will provide adequate all-night lighting. When electricity is not available, the ordinary kerosene lantern has been reported as having given satisfaction. For all-night lights, one lantern to a 20-by-20 foot room is sufficient; turning the wick up about half way in the burner will provide light about equal to that of the 15-watt bulb.
Morning or evening lights are generally used to provide birds with a 12- to 14-hour day. The excessive use of morning or evening lights, while temporarily increasing production, will probably in the end result in lowered production; the irregular use of them is worse than no lights at all.

Rations and Feeding Systems for Laying Hens

Adapt rations and feeding system to individual conditions. There are many different types of mixtures for poultry and many different systems of feeding—all having their merits and limitations. The variation in quality among recommended rations is so slight that it is almost impossible to make a mistake in choosing.

![Fig. 13.—A Homemade Coop for Broody Hens](image)

A coop of this kind is a very convenient place to keep broody hens or birds which are to be fattened.

Some club members may choose a commercial mash or a commercial supplement mixed with home-grown grains; others may prefer a mixture made from home-grown grains. First decide what type of feed mixture will suit your individual conditions best, giving consideration to such items as expense, convenience, and feed requirements of poultry.

The grain and mash system of feeding, in which the mash is usually fed continually from feeders, is probably the most practical for farm conditions. At present two methods of feeding the grain are commonly followed, either of which is satisfactory when house and litter are clean. One is to feed grain night and morning in the
litter, the bulk of it being fed at night; the other is to feed the grain in the regular feeders twice a day. Twelve to 15 pounds of grain daily during the winter is usually adequate for 100 birds.

**Satisfactory ration for laying hens.** A mash and grain ration which has proved satisfactory for laying hens can be made up as follows, each part by weight:

<table>
<thead>
<tr>
<th>Mash</th>
<th>Grain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground yellow corn</td>
<td>150 parts</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>100 parts</td>
</tr>
<tr>
<td>Wheat flour middlings</td>
<td>100 parts</td>
</tr>
<tr>
<td>Meat scrap</td>
<td>50 parts</td>
</tr>
<tr>
<td>Soybean oil meal</td>
<td>30 parts</td>
</tr>
<tr>
<td>Dried milk</td>
<td>25 parts</td>
</tr>
<tr>
<td>Alfalfa leaf meal</td>
<td>40 parts</td>
</tr>
<tr>
<td>Salt</td>
<td>5 parts</td>
</tr>
<tr>
<td></td>
<td><strong>500</strong></td>
</tr>
</tbody>
</table>

When liquid skim milk is fed at the rate of approximately 4 gallons a day for 100 birds, the amount of protein supplement in this mash can be reduced to about 5 parts of meat scrap. Whole soybeans or any other miscellaneous grain available on the farm may be used in place of oats in the grain mixture.

During the winter oyster shell and grit, any available succulent green feed such as fresh-cut alfalfa, mangled beets, turnips, and carrots, and at least 1 pint of cod-liver oil or sardine oil for each 100 pounds of mash should be added to this ration.

**Supplementary feeding.** Many flock owners supplement the regular grain-mash mixture with a moist mash fed at a convenient time once a day. The moist mash serves as a stimulus or appetizer, and it is usually not advisable to attempt to make it a major feeding. It is ordinarily made up of some of the dry mash moistened with milk and is fed in amounts which the flock will eat in ten to fifteen minutes. If the birds are losing weight or are undeveloped, a mash mixture made up of two-thirds corn meal and one-third flour middlings moistened with milk may be used in place of the regular laying mash.

**MARKETING OF MEAT AND EGGS**

**Surplus Cockerels May Be Marketed as Capons**

Surplus cockerels may sometimes be marketed to advantage as capons where market outlets are available. A market that recognizes special quality is usually required if capons are to be profitable; often they must be sold direct to the consumer.
It is sometimes a question whether it will be more profitable to sell the surplus early-maturing cockerels as broilers, or to hold them for caponizing. These early birds undoubtedly will make the best capons, and will return a profit if one has a special market. At times the surplus cockerels from late hatches can be caponized profitably. The amount of profit depends largely, however, on the prevailing prices for broilers.

**Age to caponize.** As a rule cockerels from six to eight weeks old, or from 1 1/4 to 1 1/2 pounds in weight, are the most satisfactory for caponizing. Caponizing should be done before there is any marked sexual development. Sexual development can be judged by the growth of the comb and wattles.

**Instruments required for caponizing.** A heavy investment in equipment is not necessary for caponizing. A caponizing set containing a sharp knife, a spreader, and a forceps is sufficient and is available at various prices. A cheap set is not always the most satisfactory, however.

**Directions for caponizing.** Complete detailed instructions for caponizing are included with the sale of a set of instruments. Further instructions can be obtained in Farmers' Bulletin 849, "Capons and Caponizing," published by the U. S. Department of Agriculture.

The main points to be observed in caponizing are the following:

1. Do not attempt to caponize a bird which has been fed within 24 hours of the time of caponizing. The intestines must be empty so that they will not be in the way in removal of the testicles, and so that the testicles may be readily seen.

2. Be sure to have plenty of light. A dull day is not satisfactory unless strong artificial light is available. Wait for a bright day.
3. Practice first on a dead bird to overcome nervousness and awkwardness.
4. The top of an ordinary wooden barrel may be used as an operating table.
5. Make the cut between the last two ribs; run it parallel to the ribs and fairly well up towards the back. The dotted line in Fig. 14 shows approximately the place to cut.
6. By tearing the membrane below the cut and prodding a little into the cavity, the testicle may be found and removed. It is generally a creamy yellow color and the shape of a bean. It ranges in size from that of a kernel of wheat to a small bean.
7. Keep the birds on a soft feed, such as a moist mash, for the first few days following the operation.
8. If a wind puff develops, prick it. With the aid of a needle a thread may be run thru the skin and part of the thread left in to allow the air to escape.

**Fattening mash for capons.** A fattening mash may be used during the last two weeks before capons are marketed. The following mash has proved satisfactory, all parts by weight:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn meal</td>
<td>20</td>
</tr>
<tr>
<td>Feed flour middlings</td>
<td>20</td>
</tr>
<tr>
<td>Meat scrap</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>48</td>
</tr>
</tbody>
</table>

When milk is used to moisten the mash, meat scrap may be reduced one-half.

**Quality Eggs Bring Superior Prices**

The difference between profit and loss in the poultry enterprise is often the few cents extra realized from the sale of quality eggs. The following outline gives briefly the fundamental practices necessary for the production of quality eggs.

**A Quality Egg Program**

**Breeding**
1. Use stock bred for large egg size. (Large eggs are those weighing 24 or more ounces per dozen.)
2. Use birds approximating standard body weight.
3. For hatching, use eggs of large size and uniform shape and color.

**Feeding**
1. Make liberal use of a complete ration, and limit feeding of birds to that ration.
2. Feed mash in hopper and grain in hopper or clean litter.
3. Feed to produce a uniform yolk color. Avoid excessive feeding of greens.
Management of Flock

1. Produce clean eggs.
   a. Provide plenty of clean litter on floor.
   b. Use clean nesting material.
   c. Provide droppings boards with wire netting under roost poles.
   d. Keep hens out of nests at night.
2. Produce infertile eggs.
   a. Sell or confine breeding males by May 15.
   b. Keep young cockerels away from laying flock.
3. Confine flock until noon in wet or extremely cold weather.
4. Provide a comfortable house with adequate room and equipment. This means 3 to 4 square feet of floor space and 8 to 10 inches of roosting space per bird, 1 foot of mash hopper space to every 5 birds, and 1 nest for every 6 hens.

Care of Eggs

1. Gather eggs two or more times daily.
2. Cool eggs before placing in case.
3. Hold eggs in a place where the temperature is from 45 to 65° F. The air should be fairly moist and free from objectionable odors.
4. Pack eggs with large end up.
5. Confine broody hens.

Selling Eggs

1. Market eggs at least twice a week.
2. Protect eggs en route to market from heat, cold, rain, and jarring.
3. Deliver eggs to dealers in substantial cases with clean flats and fillers.
4. Sell on a graded basis.
5. Sell to dealers properly equipped to handle eggs.

SELECTING AND PREPARING BIRDS FOR THE 4-H POULTRY SHOW

Selecting, preparing, and training poultry for a show is just as essential as preparing and training a calf for a show. The birds to be exhibited should be selected far enough in advance of the show to break them of being coop shy or nervous, and to have them in clean condition for showing.

Birds that have been handled and confined to a show coop will usually show to better advantage than birds that have not had this training. In taking a bird from the coop, grasp its wing at the shoulder and bring the bird out head first. Birds should also be replaced head first.

Common Disqualifications to Look For

Many a club member has been deprived of winning a place in a show because the judge has found something about his bird that
is disqualified it. In selecting birds for showing keep in mind, in addition to positive points in favor of a bird, the following reasons for disqualification.

1. Unworthy of a score because of serious lack of breed characteristics.
2. Faking in any manner.
3. Deformed beak.
4. Crooked or otherwise deformed back.
5. A split wing; that is, one so irregularly formed as to show a decided gap between the primaries and secondaries.
6. A slipped wing; that is, one not closely folded and not held up in proper position. This defect results from injury or from weakness of the muscles of the wing.
7. Twisted feather or feathers in wing or tail.
8. Entire absence of main tail feathers.
9. Wry tail; that is, a tail permanently turned to one side.
10. A squirrel tail in any breed but Japanese Bantams.
11. A scooped or deformed bill in drakes and ducks.
12. Side sprig or sprigs, a well-defined pointed growth apt to be present on all single-comb varieties.
13. Positive enamel-white in the face of Mediterranean cockerels and pullets except white-faced Black Spanish.
14. Positive enamel-white in the ear lobe of males and females of all American, Asiatic, and English varieties except Chanticleer, Dorking, and Red Cap.
15. Any feather or feathers, stub or stubs, or feather-like growth on shanks, feet, or toes or unmistakable indications of feather or feathers, stub or stubs, or down having been plucked from same, in all breeds required to have unfeathered shanks.
16. Any stub or stubs, feather or feathers, or feather-like growth on shanks disconnected from feathers on thigh below the hock joint.
17. Plucked hocks.
18. In four-toed breeds, more or less than four toes on either foot. In five-toed breeds, more or less than five toes on either foot.
19. Foreign color (except light gray ticking) in any part of the plumage of white varieties.

Washing Show Birds

A dirty bird is a reflection on the exhibitor. For most shows it will pay to wash white birds before exhibiting them if their plumage is soiled.

In cool weather it is absolutely necessary to bathe the birds in a very warm room so that they may dry without danger of catching cold. For washing provide three tubs of water, one for the actual washing and two for rinsing. Use soft water and a good grade of soap flakes. The water in the first tub should be warm, and should contain about one-half pound of soap in solution. Never rub the soap directly on the feathers as it is difficult to remove. In the second
tub, only warm water is needed, as it is purely a rinsing water; in
the third the water should be cool, and a little bluing may be added,
the care should be taken not to add too much as it will cause
streakiness.

In washing, hold the bird in the left hand and immerse it in the
first tub. Lather the feathers well, rubbing always with the grain
of the feathers.

In rinsing, move the bird back and forth thru the water of the
second and third tubs; moving against the grain of the feathers will
help in removing the soap. When dipping the bird into the cold
rinsing water, be careful to watch the appearance of the comb. If
there is any indication of its turning dark, remove the bird from the
water. Following the final rinsing, place the bird in a clean coop
in a warm room and allow to dry. It is then ready for the show.

POULTRY DISEASES*

How to Handle Disease

Prompt isolation of affected fowls, careful destruction of carcasses
of dead fowls, and effective cleaning and disinfection of poultry yards,
houses, and equipment are general measures necessary in the control
of infectious poultry diseases.

If a disease appears in a flock, the first essential is a correct
diagnosis. In recent years many Illinois veterinarians have received
special training in the diagnosis and control of poultry diseases.
These men are in a position to give expert diagnostic service. Take
typically affected specimens to them for autopsy. After the nature
of the disease has been established, consult with them regarding
methods of treatment.

Qualified veterinarians should also be employed for the applica-
tion of tuberculin and pullorum disease tests. Obsolete diseases of
poultry may be referred by the veterinarian to the Laboratory of
Animal Pathology, University of Illinois, for diagnosis. There is no
charge for this diagnostic service.

Fowl Cholera

Overcrowded houses, sudden changes in the weather, cold rains,
poorly ventilated houses, or changes in ration, together with overfeeding
and insanitary surroundings, seem to play an important part in giving
fowl cholera a foothold in poultry flocks. The acute and suddenly fatal

---

*This material has been taken from publications by the Laboratory of Animal
Pathology and Hygiene, College of Agriculture, University of Illinois.
type of the disease may disappear as abruptly as it appeared but often not until large numbers of fowls have died.

In cases of acute cholera, fowls may appear healthy and in a few hours be found dead about the yard, on the nest, or under the roost. A common symptom of acute cholera is a noticeable gasping or choking sound as the bird draws its breath. Diarrhea is a symptom observed in the advanced stage of the disease; many affected chickens die, however, before the bowel disturbance develops. Comb and wattles are often purple. The chief difference between chronic and acute fowl cholera is that the chronic type kills fewer fowls in a given time. Infected birds that live for several days develop diarrhea, the appetite is lessened, feathers are ruffled, and the wings and tail are drooped. Chickens affected with fowl cholera often sit quietly with the neck contracted and the eyes partly closed.

Autopsies of chickens that die suddenly from cholera often show no changes that indicate the cause of death, but in fowls that have been affected for several days hemorrhages may be found on the heart, the lungs, and the membranes that support and cover the intestines. In chickens that have shown symptoms of the disease for several days, the lungs may be dark red. The liver may be enlarged and soft and occasionally covered with small white spots.

Control measures. Sanitary yards and clean, properly ventilated poultry houses, together with wholesome and properly balanced rations, tend to keep down outbreaks of fowl cholera. Improperly drained yards should be avoided. Self-feeders and sanitary drinking containers should be provided in order to prevent pollution of feed and water.

Fowl Typhoid

Fowl typhoid is prevalent in many localities in Illinois and causes heavy poultry losses. Chickens with a pale or bluish discoloration of the comb, a loss of appetite, diarrhea, and a dull, droopy, sluggish attitude should serve as a warning to the poultryman that the disease may have made its way into his flock. It often exists in the flock for weeks or months, but it does not cause death as rapidly as fowl cholera.

One of the most common changes found upon examining the organs of the chickens that die of fowl typhoid is an enlarged brown- to mahogany-colored liver. This organ may also be soft and friable, depending upon the length of time the chicken has been sick. Inflammation is often found in the inner lining of the small intestine.

Control measures. Sanitation in the poultry yard is the first step in controlling fowl typhoid. Healthy fowls in an infected flock should be moved to clean ground and if possible divided into small groups to prevent the spread of the disease. Each chicken that shows signs of being affected should be isolated or killed. All dead chickens should be burned. Droppings from affected birds should be disposed of in the same way.

Coccidiosis of Poultry

Coccidiosis is a fatal disease of chicks on many Illinois farms. The heaviest losses occur in chicks four to six weeks old. In infected young flocks 25 to 50 percent and sometimes all the chicks die. During the
late summer and fall months a more slowly fatal type of the disease may affect pullets.

Chicks affected with coccidiosis appear unthrifty and have a tendency to move slowly or to isolate themselves from the remainder of the flock. Diarrhea is a common symptom. The feces may be tinged a reddish brown or contain fresh blood which is easily recognized. Chicks in the advanced stages of coccidiosis are very weak and sit quietly with the eyes closed and the wings drooping to the ground. Difficult and unsteady movement accompanied by leg weakness may develop. At autopsy the ceca or blind pouches may be found to be enlarged while the walls are thickened and discolored. The contents may be firm in consistency and of a reddish color while the lining may appear swollen and spotted with small hemorrhages.

**Control measures.** A thorough cleaning and disinfecting of brooder houses and incubators each week is the safest way to remove the danger of coccidiosis and to prevent its gaining a foothold before the nature of the disease can be recognized. In diseased flocks the house should be cleaned at least twice each week. Medicines are of little value in the treatment of coccidiosis, but in connection with general preventive measures the use of a saline laxative is helpful. Epsom salts in purgative doses in the feed are recommended for exposed fowls. One pound of Epsom salts for each 300 to 400 chicks four to six weeks old may be mixed in a bran mash sufficient for one feeding.

Milk as a treatment for coccidiosis has been advocated recently as a result of experiments which show that milk sugar (lactose) in the intestinal tract of the chick upon being converted to acid may inhibit the growth of the parasite in the intestines. The nutritive value of the skim milk is probably a more important factor in the increased resistance of the chicks to coccidiosis than the lactic acid factor. Chicks may not eat enough milk sugar (lactose) in the form of whole milk to be effective. To overcome this difficulty, provide a dry mash containing 60 percent of the usual ground grains and 40 percent dry skim milk, which is ordinarily 50 percent milk sugar.

**Intestinal Worms in Chickens**

Intestinal parasites in chickens are widespread in Illinois farm flocks. Chicks are infected with two general types of intestinal worms, roundworms and tapeworms. The large roundworm is 3 to 4 inches long and is found in the intestines. Tapeworms are flat, segmented, ribbon-like organisms and they cling to the wall of the small intestine. Important factors contributing to the spread of intestinal worms in poultry are overstocking and the common practice of providing free range of the barnyard or the use of ground without proper rotation and cultivation. Infested ground is chiefly responsible for perpetuation of the worm problem on many farms.

The symptoms in chickens that indicate worm infestation—weakness, paleness of the eyes and comb, diarrhea, lameness, impaired vision or blindness, paralysis, and wry neck—are also observed with other diseases. A diagnosis based on symptoms alone may therefore be misleading.
Control measures. The most economical way to combat worms in poultry is by practicing the essentials of simple poultry sanitation. The breeding places of flies and other insects should be destroyed. Accumulations of chicken manure should be prevented and flies kept out of the chicken houses by screening. The danger from earthworms and snails, which act as intermediate hosts to tapeworms, can be reduced by rotating lots, and plowing and cultivating the land on which chicks run. The objective is to keep the worm eggs in the droppings of diseased birds from contaminating the feed and water. Medicines do not destroy the worm eggs, which are the source of worm infestation. Medicines, furthermore, may provide the owner with a false sense of security and lead him to neglect essential sanitary measures.

Roundworm remedies are given in feed or by individual treatment. Oil of chenopodium, carbon tetrachlorid, tetrachlorethylene, and nicotine sulfate are given in capsules or with a rubber tube, a syringe, or a funnel. The doses depend on the weight of the fowl. In badly infested flocks individual treatment should be repeated in 5 to 10 days. Feed should generally be withheld for 12 to 24 hours before the treatment is given. Worm medicine should not be given to hens in high egg production. When flock treatment is given, tobacco dust containing 1 1/2 to 2 percent of nicotine may be used. One pound of tobacco dust should be mixed with 49 pounds of dry mash. The tobacco mixture should be fed to the pullets only every other week. The treatment may be continued for several months in mature fowls. Egg production may be reduced, however, if the tobacco is fed for longer than six months, or if an overdose of nicotine is given.

Lye is sometimes used to combat tapeworms. A lye-grain mixture may be prepared by adding 1 tablespoonful of lye to 1 gallon of wheat and oats mixed. Cover the mixture with water and boil for one hour. Stir and add more water to prevent burning. Allow the mixture to cool and feed it to fowls after they have been without food for 24 hours. During the feeding of the mixture supply plenty of fresh water.

All fowls treated for worms should be confined in a house. If they are not fed during the day and are treated in the afternoon, the droppings board should be cleaned the next morning and the refuse burned in order to destroy eggs and worms. If the treatment is applied early in the day, straw should be spread over the floor so that expelled worms and eggs can be removed and burned. Treatment may be repeated after several days, but permanent results are dependent upon the adoption of a definite system of poultry sanitation.

Chicken Pox

Chicken pox is a contagious disease affecting chickens of all ages. The canker or avian diphtheria form of chicken pox is more prevalent in Illinois flocks than the comb or wattle type which reaches its peak during the winter months. Chicken-pox lesions on the combs and wattles do not appear so frequently as does the mucous-membrane type of the disease, which is characterized by yellowish diphtheritic patches in the mouth and throat, nor do lesions in the comb and wattles cause as great losses as those attributed to the infection of the mucous membrane.
Control measures. During the past five years studies in the control of chicken pox at the Illinois Agricultural Experiment Station indicate that a practical degree of protection against chicken pox may be artificially established in healthy fowls by vaccination. The best time to vaccinate for chicken pox is one to two months before the pullets begin to lay.

**EXTERNAL PARASITES OF POULTRY**

**Lice**

Twelve or more different kinds of lice infest poultry and cause damage to the host by irritation and discomfort from biting. The eggs are laid on the feathers, usually in well-hidden parts. On the chicken one of the most common places to find both eggs and lice is in the vicinity of the vent.

Control. Sodium-fluorid solution is still considered the most effective, altho sometimes not the most practical, method of lice control.

The following solution is suggested for dipping. Mix one ounce of sodium fluorid and one ounce of laundry soap or fish-oil soap with one gallon of water. Fish-oil soap is more effective than laundry soap. The birds should be dipped twice. When a flock is dipped, the house should be thoroly cleaned, particularly around the nests and roosts, in order to destroy any lice that may be in the house.

Caution. Do not leave a sodium-fluorid solution where stock can drink it.

During cold weather sodium fluorid is best used dry. Good results may be obtained by applying the powder to the various parts of the bird by the so-called “pinch method.” The person administering the dry sodium fluorid should protect his nose and mouth with a damp sponge.

Nicotine treatment. Two kinds of nicotine solutions are commonly sold on the market: Black Leaf 40, a 40-percent solution of nicotine sulfate and one of the best known, and Black Leaf 50, a 50-percent solution of free nicotine. The Black Leaf 50 is not practical because the free nicotine is too volatile and thus causes considerable waste.

The use of nicotine sulfate as a fumigant is rather common and has given fairly satisfactory results. The recommended procedure is to apply it to the roosts in the evening just before roosting time, using one ounce to 30 linear feet of roost. An easy method of applying is to soak a cord about \(\frac{1}{8}\) inch in diameter in the Black Leaf 40, and then attach the cord to the upper side of the roost. This treatment does not kill louse eggs and therefore should be repeated in about ten days to two weeks. Do not get Black Leaf 40 on the hands.

For best results with nicotine sulfate used in this way the temperature should be around 60° F. The treatment is not effective if the house temperature is below 50° F.

**Mites**

There are several kinds of mites, which harm fowls by sucking blood and causing irritation. Inasmuch as mites usually are not on the birds

---

*This material has been contributed by W. P. Flint, Chief Entomologist, Illinois Agricultural Experiment Station and Illinois State Natural History Survey.*
during the day, the treatment is different from that for lice, the house
and not the birds being treated.

**Treatment and control.** Clean the house thoroly, particularly the
nests and roosts. The supports and the underside of the roosts should
be carefully cleaned and painted or sprayed with a miscible oil, old
crankcase oil, or lime sulfur spray.

A *miscible oil*, such as Dendrol or other tree spray oils (obtainable
from most spray dealers), may be used at the rate of 3 gallons to 100
gallons of water. The oil spray penetrates better than most sprays and
does not discolor the house nor leave a bad odor. A good spray pump
should be used to force the material well into all crevices.

*Old crankcase oil* diluted with kerosene is fairly satisfactory for
spraying roosts. If used for spraying the house, it is rather messy and
discolors the walls.

*Lime sulfur* spray is sometimes used but it must be strong, 1 to 5
rather than 1 to 7 parts. It is more expensive and does not penetrate
so well as oil.

**Bedbugs**

The common house bedbug, as well as the chicken bedbug, may
infest chicken houses.

**Control.** The treatment recommended for mites may be used against
bedbugs, tho it may be necessary to repeat it and to use a stronger
mixture. Burning 3 pounds of sulfur per 1,000 cubic feet, with the house
tightly closed, is quite effective in ridding a building of a heavy infesta-
tion of bedbugs. The sulfur may be put in a shallow metal dish, and
soaked well with radiator alcohol to insure complete burning. The sulfur
will be much more easily burned if a good-sized rag is placed over the
bottom of the pan and the sulfur placed on this rag before it is lighted.
All birds should be kept out of the house during the time it is being
fumigated. The pan holding the burning sulfur should be set on bricks
over a larger pan of water to avoid danger from fire.

**Depluming Mites**

The depluming mite works around the base of the feather, causing
irritation, which may cause feather pulling.

**Control.** Treat by dipping the fowl in a mixture of 2 ounces of
wettable sulfur, 1 ounce of soap, and 1 gallon of water. Wettable sulfur
can be obtained from any dealer in orchard sprays.
Publications Available in the Local 4-H Club Library

Buildings and Equipment
- A Colony Brooder House That Starts Chicks Right (C-291)
- Directions for Building Illinois Shed-Roof Poultry House (C-368)
- Directions for Building the Straw-Loft Poultry House (C-412)
- Poultry Farm Equipment (C-333)

Feeding and Management
- Raising Chicks at a Profit (C-329)
- Feeding for Egg Production (C-275)
- Keeping the Farm Flock Healthy (C-374)

Diseases
- Fowl Typhoid (C-287)
- Coccidiosis of Poultry (C-288)
- Botulism in Fowls (C-289)
- Infectious Laryngotracheitis in Fowls (C-379)
- Incubator Hygiene in the Control of Pullorum Disease (C-403)
- Fowl Pox (C-430)
- Pullorum Disease of Chicks (C-432)
- Fowl Cholera (C-441)

Miscellaneous
- Capons and Caponizing—U. S. D. A. Farmers’ Bulletin 849
TO POULTRY CLUB MEMBERS

This manual covers the basic facts needed by you as a poultry club member to guide you in the work of your project. The authors hope, however, that you will not be satisfied to limit your reading to it. There is a wealth of good reading on the subject of poultry production and management, and every ambitious member will enlarge his information and add to his experience by reading other good texts and pamphlets and by discussing his plans and problems with older acquaintances who have made a success of their poultry enterprises.

Consult your club leader and your club library for further guidance.