

South Dakota State University  
**Open PRAIRIE: Open Public Research Access Institutional  
Repository and Information Exchange**

---

Cooperative Extension Circulars: 1917-1950

SDSU Extension

---

1-1940

## Poultry Management: A manual for 4-H club members

M. H. Simonson

Follow this and additional works at: [http://openprairie.sdstate.edu/extension\\_circ](http://openprairie.sdstate.edu/extension_circ)

---

### Recommended Citation

Simonson, M. H., "Poultry Management: A manual for 4-H club members" (1940). *Cooperative Extension Circulars: 1917-1950*. Paper 384.  
[http://openprairie.sdstate.edu/extension\\_circ/384](http://openprairie.sdstate.edu/extension_circ/384)

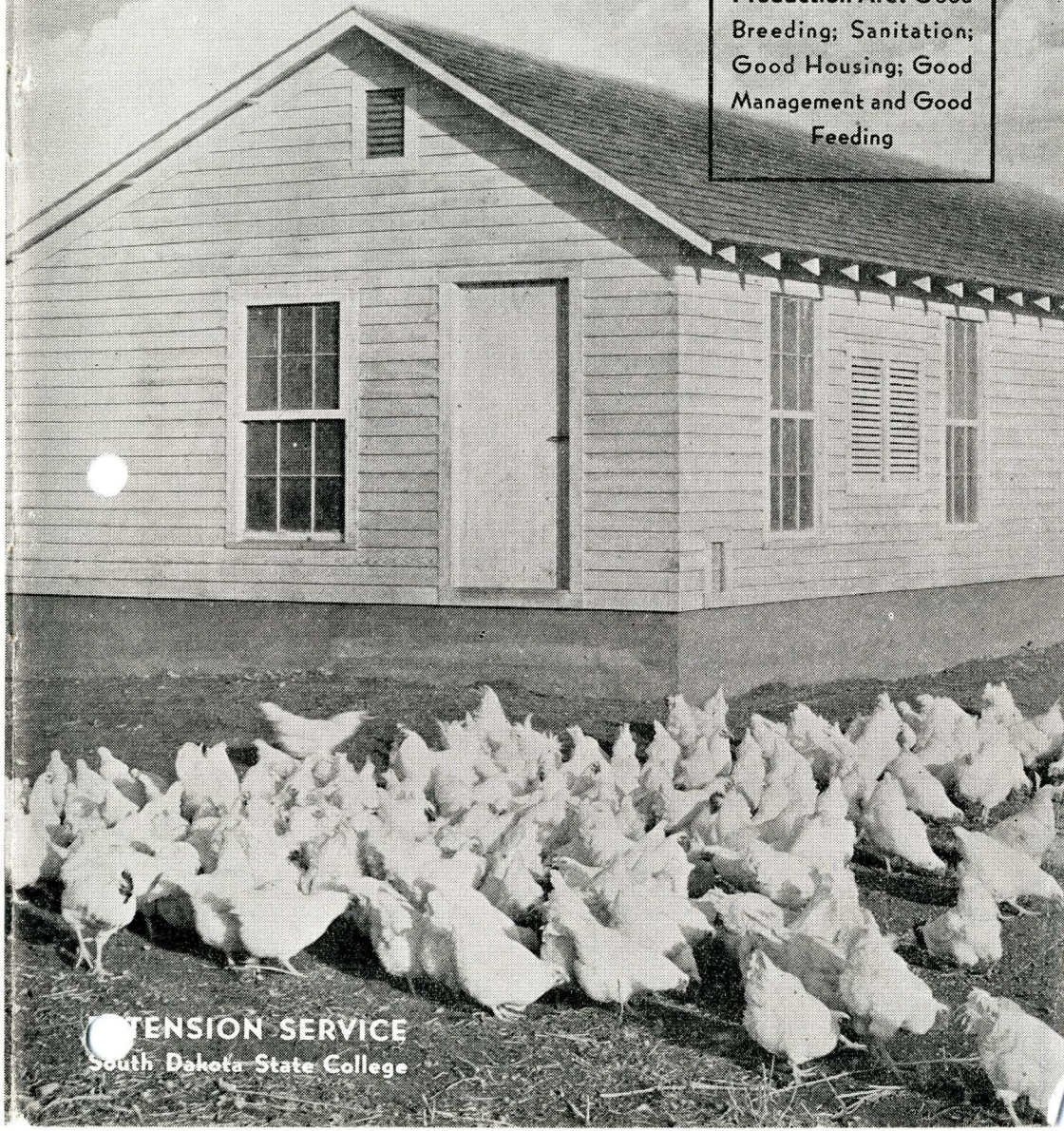
This Circular is brought to you for free and open access by the SDSU Extension at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Cooperative Extension Circulars: 1917-1950 by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact [michael.biondo@sdstate.edu](mailto:michael.biondo@sdstate.edu).



# Poultry Management

A Manual for 4-H Club Members

Five Fundamentals  
Of Profitable Poultry  
Production Are: Good  
Breeding; Sanitation;  
Good Housing; Good  
Management and Good  
Feeding





## *Poultry on Farms in South Dakota*

Poultry and egg production in South Dakota should be considered as an important part of the farm business. Since over 90 percent of the farmers in South Dakota raise poultry, careful consideration should be given the farm flock. The annual income from poultry and eggs produced in South Dakota is in excess of 15 million dollars. This income is especially important when we consider that it is distributed throughout the year and is used largely to buy groceries, clothing and other necessities needed by the farm family.

During the past twenty-five years, many changes have taken place in the egg and poultry industry. Our industry is rapidly leaving behind "the setting hen with her brood of chicks being fed on bread crumbs and clabber milk." Today success in poultry raising depends upon good breeding, good feeding, good housing, good management and disease control.

Because of the interest shown in improving the farm flock and the demand for facts concerning poultry raising, this circular is being offered to the members of the 4-H Clubs.

The author wishes to acknowledge the assistance rendered by the following persons in the preparation of this circular:

Dr. W. E. Poley, Head of the Poultry Department

Professor R. L. Patty, Head Department of Agricultural Engineering.

Credit is due O. J. Weisner for information taken from Extension Circular 15 published in 1932 by the South Dakota Extension Service.

# Table of Contents

Establishing a Poultry Flock.....	4-7
Which breed to raise; how to buy baby chicks; selection and care of hatching eggs; and incubation in small farm incubators.	
Chick Brooding, Feeding, Management .....	7-12
Grow healthy chicks; chick brooding; feeding baby chicks; care of young stock on range.	
Managing Laying Hens.....	12-15
How poultry profits are determined; housing the laying flock; why inadequate equipment cuts down the profits; keep the hens comfortable.	
Feeding Hens for Egg Production.....	16-22
Why feed?; why a balanced ration?; recommendations for laying rations; scratch grain should be fed with mash mixtures; what feed mixtures to use; wet mash; and using electric lights in the poultry house.	
Home Made Equipment .....	22-26
Chick feeders watering fountains; roosts; mash hoppers for the laying flock; crate for catching birds; nests and watering fountains for laying hens.	
Sanitation and Diseases.....	27-31
Germs cause disease; cleaning and disinfecting; and control of lice and mites.	
Poultry Judging.....	31-36
Judging exhibition poultry; standard weights; scale of points; culling; how to distinguish the layer from the non-layer; pigmentation; molt; body capacity; and handling qualities.	
How to Show Poultry .....	36-38
Selection of good type poultry and preparations for the show.	
Remodeling the Poultry House.....	38-41
The straw loft; ventilation; dropping boards are an aid in floor sanitation; and the roosting alcove.	
Caponizing .....	42-47
The purpose of caponizing; breeds for capons; instruments; when to operate; preparation for operation; method of holding the bird; the operation; and the care and feeding of capons.	
Marketing.....	47-54
Marketing eggs; how to grade eggs; market classes of poultry; marketing poultry; finishing or fattening poultry; range fattening; pen fattening; crate fattening; killing and dressing poultry for market and packing.	
Information for Poultry Club Members.....	55



# POULTRY MANAGEMENT

By M. H. SIMONSON

*Assistant Extension Poultryman*

Poultry and eggs are produced on 90 percent of all the farms in South Dakota. The annual income from poultry raising during the years 1935-39 was more than 15 million dollars which is more than \$160 per farm. South Dakota ranks 21st in the United States in the number of chickens raised, and is the 12th leading turkey producing state. The gross income from poultry and eggs is usually not large on most farms but is well distributed and is used to meet many of the small expenses which come up throughout the year. In addition to paying grocery bills and other expenses, the poultry enterprise furnishes a large proportion of the food consumed by the farm family.

## Establishing a Poultry Flock

### Which Breed To Raise?

In deciding which breed of chickens to raise, first consideration should be given to personal likes or dislikes. However, in deciding this, one should consider whether the birds are to be raised for market poultry or eggs. In South Dakota, the poultry sold for meat represents a large part of the profits from poultry. As a result, the most popular breeds in South Dakota are: Plymouth Rocks, Buff Orpingtons, Rhode Island Reds, and Wyandottes. For those who have a good egg market and limited amounts of feed, Leghorns are very popular. Leghorns require from 15 percent to 25 percent less feed to raise to maturity than the above mentioned breeds.

In South Dakota, the dual purpose breeds of chicken have a definite advantage in being able to withstand the cold weather. They have smaller combs, which are less likely to freeze, and as a general rule are better producers during the winter months.

In deciding which breed to raise, it is not important which of the above mentioned breeds one decides to raise, but rather which "strain" one selects. There are high producing strains of Reds, Rocks and other American breeds as well as Leghorns. The opposite is also true. It is wise to secure chicks or hatching eggs from flocks which have been bred for high egg production and meat quality. Good chicks can be purchased in any of the popular breeds if one is particular in ordering from a reliable source.

### How To Buy Baby Chicks

Buy chicks by the quality of breeding and disease control methods that have been followed by the hatchery and flock-owner who have produced the chicks. There are several reliable hatcheries in South Dakota that are continually improving the quality of the baby chicks they sell by following a good breeding program. This means they are using males to head their

flocks that are from Record of Performance breeders with known egg production and standard bred qualities.

If you do not have a local hatchery that you feel is producing high quality baby chicks, it is a good plan to order your chicks from a hatchery cooperating in the National Poultry Improvement Plan. It is a sound policy, when you do not know whether or not a hatchery produces good chicks, to buy from one that is following a recommended poultry improvement program, and is under the supervision of an official state agency.

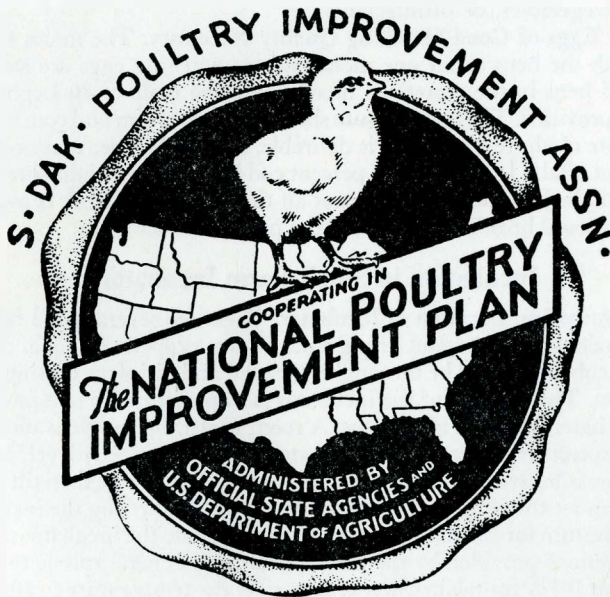


Fig. 1. This emblem identifies breeding stock, hatching eggs and baby chicks produced under official supervision in a constructive breeding and pullorum disease control program.

### Selection and Care of Hatching Eggs

**Gather Eggs Frequently.** The care given the eggs to be used for hatching will determine, to a large extent, the quality of chicks hatched. Eggs should be gathered every two hours during cold weather to keep them from becoming chilled. Only clean eggs should be used for incubation. Therefore, it is important that you provide one nest for every seven hens, and keep the nests clean. Do not wash hatching eggs, and if the shell is dirty clean it off with steel wool or reject the egg.

**Select Large Eggs With Sound Shells.** No egg weighing less than two ounces should be used for incubation. The eggs should be well-shaped with strong shells, since eggs with cracked shells will not hatch. In the case of



varieties of chickens that lay white-shelled eggs, all eggs to be used for incubation should be free from tints.

**Only Fresh Eggs Should Be Set.** Eggs should not be held longer than 10 days for incubation. Hatching eggs should be placed in egg cases with the large end up, using fillers and flats that are clean and in good condition. It is a good plan to set the egg case on a slant, by placing a four-inch block under one end. The ends should be reversed every evening. Hatching eggs should be held in a room where the temperature is between 45 and 55 degrees. Do not hold eggs in a cellar where there are strong odors, such as kerosene, vegetables, or disinfectants.

**Fertile Eggs of Good Hatching Quality Necessary.** The males should be placed with the hens about one month before hatching eggs are saved. One male to 15 hens in the American breeds, and one male to 20 Leghorn hens should be provided. The laying house should be kept warm and comfortable. A temperature of above 35 degrees is desirable. A good breeder mash containing five percent alfalfa leaf meal, two percent cod liver oil, and eight percent dried milk should be kept before the hens at all times. If liquid milk is available, a container should be filled and kept in the pen before the birds.

### **Incubation in Small Farm Incubators**

**Equipment and Location of Incubator.** There are several good farm incubators, which will hatch good strong chicks when properly set up and regulated. The incubator should be thoroughly cleaned and disinfected using a strong lye solution. The location of the incubator is important; and one finds a well-ventilated basement is an ideal place. A room heated by a stove is undesirable, due to temperature changes. The incubator must set perfectly level, and if the machine is heated with hot water; fill the water pipes and then tilt the incubator to remove the air pockets from the pipes before leveling the incubator.

**Temperature for Incubators.** Operate and regulate the incubator according to the directions provided by the manufacturer. A general rule is to start the incubator at 101½ for the first week, then raise the temperature to 102 degrees the second week and 103 degrees the third week. Do not let the temperature go above 103 degrees at any time during the incubation period. After placing the eggs in the incubator, close it up and leave it for 24 hours. This will give the eggs time to warm up and reach the desired temperature. Place the bulb of the thermometer in the incubator on a level with the top of the eggs. The bulb should not rest on the eggs.

**Operating the Incubator.** The lamp should be filled each morning, at which time the wick should be cleaned. All temperature changes must be made by the flame (by turning the wick up or down). The eggs should be turned beginning the second day, and should be turned four times during the day. Divide the time between turnings equally. Candle the eggs on the 18th day and remove all clear eggs. After the 18th day, do not open the incubator until the hatch is off unless it is absolutely necessary to remove some shells and to let the chicks into the nursery tray.

**Moisture and Ventilation Necessary.** Fill moisture pans, or place wet sand in pans below the egg trays on the evening of the fourth day. Remove the

moisture pans on the seventh day, replace them on the 11th day and remove on the 14th day. Place moisture pans again in the incubator on the eighteenth day, and keep in the machine until the hatch is completed. If the room in which the incubator is located has a high humidity less moisture will be required. Ventilation is important. The ventilators should be kept almost closed the first fourteen days, and gradually open them until on the 18th, 20th, and 21st day they should be wide open. Shown in Figure 2 is an egg illustrating the proper shrinkage by days.

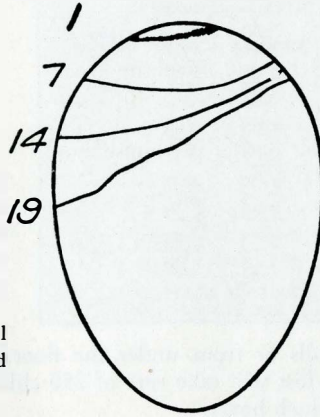


Fig. 2. Diagram showing the air cell on the first, seventh, fourteenth, and nineteenth days of incubation.

## Chick Brooding, Feeding, Management

### Grow Healthy Chicks

**Clean Chicks of Good Breeding.** Buy or hatch chicks that come from parent stock which have been carefully culled for health, vigor, and egg production, and, also, tested for pullorum disease (bacillary white diarrhea). Buy U. S. Pullorum tested chicks whenever possible.

**Hatch Chicks Early.** Hatch chicks of general purpose breeds such as Plymouth Rocks, Reds, and Wyandottes not later than May 1, and chicks of the lighter breeds such as Leghorns, not later than May 20.

**Clean Brooder House.** The brooder house should be thoroughly scrubbed with boiling lye water, and when dry, disinfected with an approved disinfectant. Clean litter is required.

**Clean Ground.** Chicks should be raised on green range that has not been used for any poultry for the previous two years.

**Clean Feeding of Complete Ration.** All feed should be fed in clean hoppers, and the waterers should be cleaned daily. A wire frame is suggested to place under the feeders and waterers.

It has been demonstrated in several states, that chick mortality can be kept under 10 percent if the above "Grow Healthy Chick" program is followed. Where one or more points are neglected, a mortality of 20 to 50 percent may be expected.



## Chick Brooding

**Brooder House.** A good brooder house is essential in raising young chicks. The brooder house should be thoroughly scrubbed and disinfected. It should then be moved to a location where the ground has not been contaminated by other poultry. It is important that there are no drafts coming

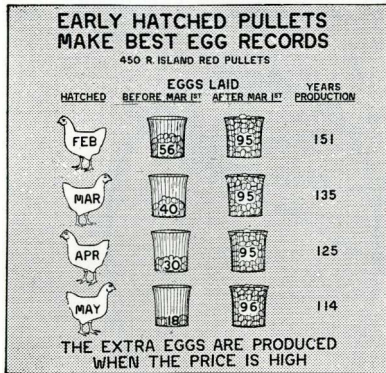


Fig. 3. Hatch chicks of the general purpose breeds such as Plymouth Rocks, Orpingtons, Rhode Island Reds, and Wyandottes not later than April 15 and light breeds such as Leghorns not later than May 15.

in from the walls or from under the floor. Provide plenty of room. A house 10 by 12 feet will take care of 250 chicks and will require a brooder stove with a 56-inch hover.

**Brooder Stove.** A hard coal burner or oil brooder stove has proved to be the most practical type of brooder stove for South Dakota. The stove should be set up and operated for two days before the chicks are placed under the hover. Make sure the stove is level and that all necessary precautions are taken to prevent fire hazards. The temperature should be regulated to 95 degrees at a point two inches from the floor at the outer edge of the hover. Hold the temperature at 95 degrees the first week, and then gradually reduce the temperature five degrees each week until the chicks no longer require heat.

**Brooding Equipment.** Straw or wood shavings are satisfactory litter when the house is cleaned regularly. The litter should be raked through each day to keep it from matting, and should be cleaned out once a week. Peat moss or other commercial litter is very satisfactory and preferred by many poultry raisers for the first four weeks.

A protecting circle made from fine mesh wire or cardboard boxes should be used the first ten days to keep the chicks close to the brooder stove, and to prevent the chicks from piling up in the corners.

**Feeders and Waterers.** Allow two inches of hopper space for each chick. For 250 chicks, five mash hoppers four feet long will be needed. For the first five days, cup flats that are used in egg cases are handy to use in order to allow all the chicks to get feed.

Provide five, one-gallon drinking fountains for 250 chicks, and make sure a fresh supply of clean water or milk is kept before the chicks at all times.

**Roosts.** Chicks should be encouraged to roost as soon as it is comfortable for them to be away from the hover. This is usually during the third week. Allow three inches of roosting space per chick. Two hundred fifty chicks would require 7 roosts spaced 8 inches apart on a frame 10 feet long and 5 feet wide with 1-inch wire netting below the roosts. Additional roosts should be provided as the birds grow older.

### Feeding Baby Chicks

Feeding starts with the young chick and continues until the bird is marketed. Feed is expensive, but should be considered an investment rather than an expense. The better the bird is fed, the more it will return on this investment.

Baby chicks should be put under the hover of the brooder when they are from 36 to 48 hours of age, and given their first feed at this time. Chicks will not be injured by feeding before this time, but since there is nothing to gain by feeding them earlier, two day's brooding expense can be saved. Chicks purchased from a hatchery are usually 36 hours old, and should be placed in the brooder house as soon as they arrive.

When chicks are first placed in the brooder, they often peck at what ever is in sight. Feed and water should be available to insure the chicks getting a good start. For the first few days, feed may be placed on newspapers, paper plates or egg case flats. Allow about one paper plate or its equivalent for each 25 chicks. Remove and burn the paper containers before they get soiled. Provide enough feed hoppers to allow two inches of hopper space for each chick.

Chick rations are as numerous as the varieties of chicks themselves, but either a good commercial ration should be used, or a ration recommended

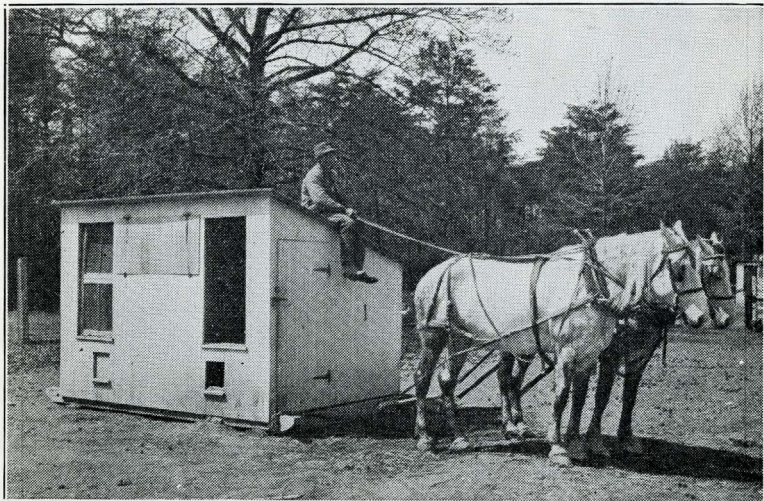


Fig. 4. Moving a colony house to a new location on clean ground.



by your State Experiment Station. Do not mix up some cornmeal, oatmeal, and perhaps a little hard boiled egg, and call it a chick mash.

The following all-mash ration recommended by the South Dakota State College, when mixed thoroughly and according to directions will give excellent results.

Percent		Percent	
30	ground yellow corn	7	dried buttermilk
14	wheat bran	5	alfalfa leaf meal
14	wheat middlings	1	salt
14	pulverized oats	1	cod liver oil
14	meat and bone scraps		

Only the following changes are justified. First, if some liquid skim milk or buttermilk is available, the dried buttermilk may be omitted from the mash. Second, if liquid milk is available so that it is kept before the chicks at all times, the meat and bone scraps can be reduced to ten percent.

Standard cod liver oil should be used (standard oil contains at least 85 U.S.P. Units vitamin D per gram). The oil can be mixed with the least difficulty with wheat bran. Mix the bran and oil thoroughly by hand, and then mix this with the remaining mash ingredients. Cod liver oil must be supplied as long as the chicks are confined. As soon as they are allowed to run outside, the cod liver oil may be omitted from the ration.

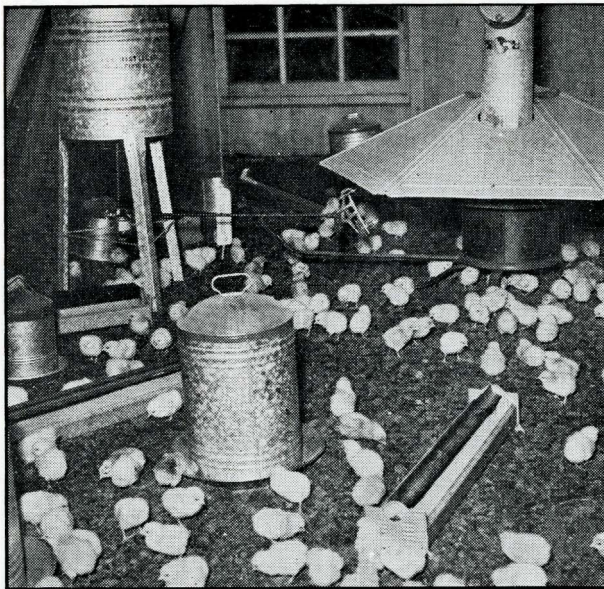


Fig. 5. A oil brooder stove with brood of chicks. This type of brooder is well adapted for brooding 200 to 300 chicks. Note particularly the thermometer, feeders and water fountains.

Little is gained by changing rations in order to reduce feed costs during the first eight weeks. A chick will eat only about four pounds of feed during this period, which will have little, if any, effect on profits.

#### Feed Consumption Per 100 Chicks

Age in weeks	Pounds of mash to date	Pounds of grain to date	Total feed consumption to date
1-4	115		115
5-8	400		400
9-12	700	95	795
13-16	900	250	1150
17-20	1200	400	1600
21-24	1500	700	2200

Provide plenty of water fountains and keep a supply of clean water or milk, or both, in front of the chicks at all times. Use pure clean water. Pills and other disinfectants have little if any value in keeping the chicks healthy. Disease among baby chicks can be prevented only by buying healthy chicks and rearing them under sanitary conditions.

#### Care of Young Stock on Range

Growing pullets and cockerels should not be neglected and forgotten during the summer months. Care should be taken to see that the birds are supplied with clean cool water regularly, and that mash and scratch grain are available at all times.

For the growing range, select a clean piece of ground, which has not been used for poultry the previous year, preferably sown to alfalfa. The



Fig. 6. Artificial shade for use on range.

corner of an alfalfa field is ideal for summer range. Range shelters should be provided if the brooder house cannot be moved. If ground seeded to alfalfa is not available, it may be seeded to oats and rape or some other good green feed that will provide good quantities of succulent green feed.

Construct a large mash hopper with a water tight roof that can be used out of doors. Small hoppers are not so satisfactory, since they require too much time in order to keep them full, and often they are neglected and the birds are out of feed.

Remember that feed is an investment, and in order to have well-developed pullets, it is essential that the proper nutrients are supplied during the summer months. The following mash formula is easy to mix and inexpensive, but has proven to be very satisfactory, and is recommended by the South Dakota State College:

Pounds		Pounds	
40	ground corn, millet, or sorghum grains	5	dried milk
40	ground oats, wheat or barley	5	alfalfa leaf meal
10	meat and bone scraps	1	salt

Oyster shells should be kept before the birds at all times.

Pullets should not be crowded in small brooder houses during the summer. The cockerels should be separated at the end of eight weeks, or as soon as they can be distinguished from the pullets. It will give them more room for roosting and they will develop more rapidly. Provide 35 lineal feet of roosting space for each 100 pullets up to four months of age, and 50 lineal feet after that age.

## Managing Laying Hens

### How Poultry Profits Are Determined

**Egg Production and Labor Income.** High egg production is essential to a low cost for each dozen eggs produced at a high labor income. In a study of flock records kept for a period of ten years in Minnesota, it was definitely shown that the rate of labor income was directly in line with the number of eggs produced. See Table 1.

Table 1.—Egg Production and Labor Returns, Average of Ten Years

	No. flocks	Eggs per hen per year	Labor income per 100 hens per year
High producing flocks	183	185	\$223.00
Medium producing flocks	183	147	130.00
Low producing flocks	176	111	71.00

**Mortality.** The poultryman who keeps an adequate set of records, finds that low egg production and high mortality results in less profit from the flock. The following chart divides 61 Leghorn flocks into four groups, according to the average labor income per bird.

**Winter Egg Production.** While the cost of producing eggs during October, November, December and January may be higher than during the





including roosts, dropping boards, nests, feeders, water containers, and stands should be removed. The walls and ceiling should be swept and all litter and dirt removed from the floor and side walls. In houses where there are no permanent floors, at least six to eight inches of the soil or gravel should be removed and replaced with clean cinders, gravel and soil after the house has been cleaned.

After the equipment has been removed, the floor, walls and sills should be thoroughly scrubbed with boiling lye water, using one pound of lye to 10 gallons of water. All of the inside equipment should be thoroughly scrubbed with lye water and allowed to remain outside in the sun for 12 hours.



Fig. 9. Improved poultry house equipped with dropping boards. Note deep litter, water stand, nests and egg basket.

### **Why Inadequate Equipment Cuts Down the Profits**

Laying hens as well as baby chicks can not be crowded, and hens must be provided with adequate equipment if good egg production is to be expected. Overcrowding lowers the vitality of the hens, prevents the birds from getting plenty to eat and drink, and makes it almost impossible to keep the house clean and dry. The South Dakota type poultry house is 16 feet by 32 feet, which has a total of 512 square feet. This house will accommodate 175 Leghorn hens, or 130 Plymouth Rocks, Reds, or similar heavy breeds. This allows three square feet of floor space for Leghorns and four square feet for heavies. The following equipment should be provided for 150 hens.

- 22 nests—1 nest to every 7 hens
- 3 five-foot mash hoppers—1 lineal foot of space for every 5 hens
- 4 three-gallon water containers—1 quart of water for every 3 hens
- 112 linear feet of roosts—9 inches for each hen
- 2 oyster shell and grit hoppers—1 shell hopper to every 75 hens

**Litter.** Proper litter for the laying house is important. The litter should be kept clean and dry at all times and should be replaced as often as is necessary. This will vary, depending upon the number of birds in the house and the system of ventilation used. From 6 to 12 inches of clean straw on the floor provides an excellent litter.

**Dropping Boards or Dropping Pits.** During the past three years, many poultrymen have built dropping pits in their laying houses and are well pleased with the results. Dropping pits can well be recommended for houses with dirt floors, as the moisture is readily absorbed. The pits help keep the house dry, since the droppings fall beneath the wire netting at the back of the house. Dropping pits, also, help in keeping the house clean and more sanitary, since the birds cannot get at the droppings. The droppings should be cleaned out every two or three weeks.

Dropping boards have been recommended for several years and have proved very satisfactory. Many prefer the dropping boards to the pits, since they can be cleaned much more easily. They also have the advantage of forming a roosting alcove in the South Dakota type house. This alcove helps keep the birds warm when they are inactive at night, since the heat is kept near the hens.

Hens should be trained to use the roosts as soon as they are placed in the laying house. Birds that crowd into corners on the floor, roost on nests and feeding equipment, become chilled and are more susceptible to colds and other diseases.

### **Keep the Hens Comfortable**

Variable and extremely low temperatures in South Dakota will greatly influence winter egg production unless good housing is provided and proper feeding and management of hens is employed. Poultry houses with high roofs can be made warmer by the installation of a straw loft six and one-half to seven feet from the floor. Information concerning proper housing can be obtained from Extension Circular 362, "Poultry Houses for South Dakota."

During cold, changeable weather, daily regulation of the windows is necessary in order that the house temperature and ventilation is maintained. During cold weather, the fresh air should be admitted by lowering one or two windows (from the top) so that a fairly small amount of fresh air is admitted several feet from the floor. On extremely cold days, it is best to close all windows. It is important that no drafts are permitted on the floors, as this will result in colds and other diseases.



# Feeding Hens for Egg Production

## Why Feed?

The purpose of a ration for egg production is two-fold. First, it must furnish the heat required to maintain the body temperature of the chicken at about 106.7 degrees. In addition, feed is needed for energy and other materials necessary for the maintenance of the body and health. Secondly, after these body requirements are met, and, if proper nutrients are available, the balance of the feed can be used for the production of eggs.

From 75 to 80 percent of the total feed consumed by birds in good production is required for the maintenance of the body. Thus, it can be seen that only 20 to 25 percent more feed will be required to produce 100 to 150 eggs in a year. This amounts to around 20 pounds of feed. If no eggs are obtained, it will take 60 to 65 pounds of feed to maintain one bird for a year. Most of this is wasted, as the hen will not gain much weight during the year.

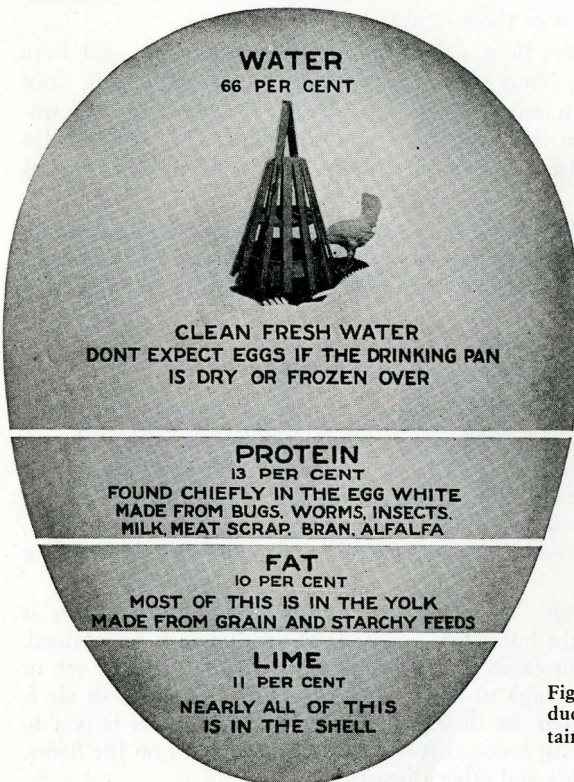


Fig. 10. Eggs can not be produced unless the feed contains the material from which eggs are made.

### Why a Balanced Ration?

A balanced ration may be defined as a combination of feeds which supply all the necessary nutrients in the proper portions to be utilized by the hens for profitable egg production. Nutrients required by the laying hen

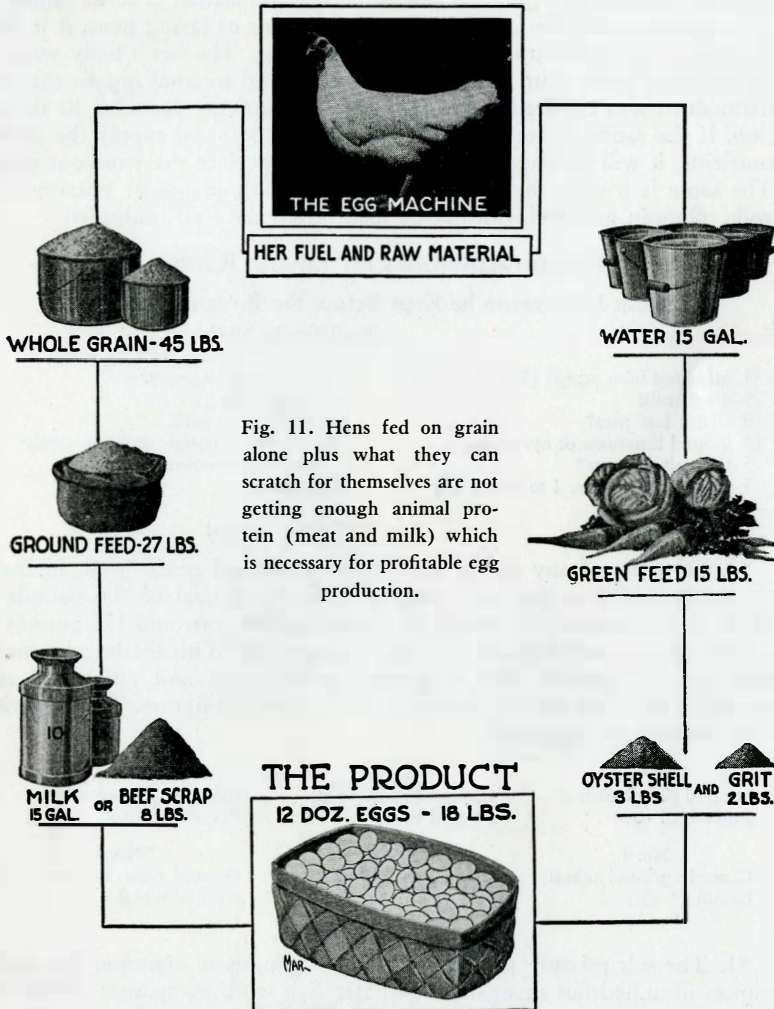


Fig. 11. Hens fed on grain alone plus what they can scratch for themselves are not getting enough animal protein (meat and milk) which is necessary for profitable egg production.

include several different proteins, fats, carbohydrates, minerals and vitamins. These nutrients are taken out of the feed in the processes of digestion and absorbed by the blood in the maintenance of life and egg production. While cereal grains are good sources of carbohydrates, they are poor

sources of the vitamins, minerals, and proteins which are used in the manufacture of eggs. All cereal grains are deficient in the same nutrients, therefore, a combination of three or four of these grains will not supplement the deficiencies, and it is necessary to use animal or vegetable protein concentrates, additional sources of minerals, and feeds rich in vitamins to supplement home-grown grains if profitable egg production is to be obtained.

In order to provide for the body requirements of laying hens, it is well to consider the make-up of the hen and the egg. The hen's body with all the feathers, bone, skin, muscles, tendons, fat and internal organs must be maintained and repaired each day from the nutrients provided in the ration. If the ration is not balanced, that is, if it does not supply the proper nutrients, it will be impossible for the body to replace the worn-out tissue. The same is true in the production of eggs, without proper nutrients the yolk, albumin and shell can not be made from the feed consumed.

### Recommendations for Laying Rations

#### Mash Mixtures to be Kept Before the Birds in Hoppers

##### Basal Laying Mash

75 meat and bone scraps (50% protein)  
 25 dried milk  
 30 alfalfa leaf meal  
 10 ground limestone or oyster shells  
 5 fine salt mixture\*  
 5 fish oil (November 1 to March 31)

150 pounds total

##### Basal Breeder Mash

To be fed if hatching eggs are saved

65 meat and bone scraps  
 40 dried milk  
 40 alfalfa leaf meal  
 10 ground limestone or oyster shells  
 5 fine salt mixture\*  
 10 fish oil

170 pounds total

Equal parts of any one of the following ground cereal grain mixtures should be added to the basal mash to make up a total of 500 pounds of mash. For example, 175 pounds of ground yellow corn and 175 pounds of pulverized oats may be used with the laying mash. With the breeder mash, however, 165 pounds each of ground yellow corn and pulverized oats would be sufficient for 500 pounds of breeder mash mixture. The following combinations are suggested:

<b>No. 1</b>	<b>No. 2</b>	<b>No. 3</b>
Ground yellow corn Pulverized oats	Ground yellow corn Ground barley	Coarsely ground wheat Pulverized oats
<b>No. 4</b>	<b>No. 5</b>	<b>No. 6</b>
Coarsely ground wheat Ground barley	Ground proso millet Pulverized oats	Ground proso millet Ground wheat

#### Suggestions

- \*1. The salt mixture should consist of 5 pounds of common salt and 2 ounces of anhydrous manganous sulfate. Salt and manganese should be thoroughly mixed and then this mixture added to the other ingredients.
2. Oyster shells and grit or limestone grit should be kept before the birds in hoppers.
3. Water should also be available at all times. Birds will not consume mash and grain if their water containers are dry or frozen.



4. Alfalfa leaf meal may be omitted from the mash if birds have access to plenty of other green feed, but it appears very necessary when yellow corn is not used and when birds are kept confined or otherwise do not get green feed for vitamin A. Good quality leafy alfalfa hay may be fed in racks and the alfalfa leaf meal omitted. However, a regular supply is necessary.

5. The dried milk may be omitted from the mash, but probably egg production will not be quite so good. If, however, some liquid milk is available for feeding, the dried milk may be omitted. If enough liquid milk is available so that it can be left before the birds at all times, the meat scraps may be reduced to eight percent of the mash. Either sweet or sour liquid milk, or dried milk is very valuable to improve the hatchability of eggs.

6. A good grade of fish oil with a guaranteed vitamin D potency should be given in the late fall and winter, and also at other seasons if birds do not have access to direct sunshine. Directions should be followed as indicated. Some prefer to mix one-third of a pint of fish oil daily with the scratch grain in hoppers. This would be sufficient if hatching eggs were produced, but only half of this amount would be necessary if eggs were not saved for hatching.

If fish oil is included in the mash, it can be mixed with bran, yellow corn, pulverized oats or some other ingredient, and this in turn mixed into the mash.

If cod liver oil concentrate is used, 1¼ pounds will be needed for 500 pounds of laying mash, and 2½ pounds for the same amount of breeder mash.

### **Scratch Grain Should Be Fed With Mash Mixtures**

Scratch mixtures should be given in hoppers or in the litter at the rate of three pounds per 100 birds every morning, and as much as the birds will clean up for the night feeding.

Scratch mixtures include a variety of combinations. Merely select the grains which are cheapest and most readily available. The following are a few suggested combinations. Other mixtures may be equally good.

**No. 1**  
250 lbs. whole wheat  
125 lbs. cracked yellow corn  
75 lbs. whole oats  
50 lbs. whole barley

**No. 2**  
Equal parts of any of the following grains:  
1 Wheat, oats, millet and kafir or milo  
2 Wheat, barley and oats  
3 Wheat, kafir and milo  
4 Yellow corn, wheat, and milo  
5 Millet, wheat and corn

### **What Feed Mixtures to Use**

Feeds and feeding methods probably have the most important influence on the cost of production and profits. It is, therefore, very essential that care be exercised in the selection and use of feeds. There are a great many

possible combinations of feeds which would give good egg production, but in selecting a ration to use, cost and availability are the most important considerations aside from the fact that only recommended combinations be used. Whether to use a commercial mixture or a home-mixed ration depends upon several factors. Precautions should be followed in either case.

**Commercial Mixtures.** Only well-known brands of commercial mixtures should be used. One should be guided in his choice by the results secured by others and by the reputation of the local distributor. In addition, cost should be considered, both in comparison to other commercial mixtures of good standing and in comparison with home-mixed rations. Commercial mixtures are perhaps most often used with small flocks and where feed mixing facilities are not available, or where there is insufficient time for mixing. In addition, the commercial mixture is used to advantage where there is a limited supply of home-grown grains or inadequate feed grinding facilities. If there is plenty of home-grown grain, it may be more practical to use a concentrate instead of a laying mash. Some hatcherymen prefer to have their flock owners use a certain commercial mixture which is believed to give good hatchability and, in return, a premium is offered for the hatching eggs produced.

**Home-Mixed Rations.** It is very important to follow directions carefully in the use of home-mixed mashes, as every ingredient serves a particular purpose in meeting the requirements for health, maintenance and egg production. Substitutions of one ingredient for another may lead to considerable trouble unless these substitutions have been previously tried and recommended. Home-mixed mashes may be used to advantage where there are plenty of grains available. Milk products and green feeds ordinarily available on many farms may be used to advantage, and it usually is poor economy to purchase commercial mixtures which already have these ingredients included. Although home mixtures are not so convenient to use, they are usually cheaper and give just as good egg production as commercial mixtures. In addition, one knows what is in the mixture and can depend upon the composition and quality of the ingredients used.

### **Wet Mash**

Many poultrymen follow the practice of feeding a moist mash. Usually the laying mash mixture is moistened just to the point where it is crumbly. Too much water added to the mash makes it sloppy, and it freezes more quickly if not used immediately. Chickens do not seem to eat mash so readily if it is too wet. Generally about as much of the moistened mash as the birds will clean up in a half hour is given once a day during the fall and winter months. If the birds are laying well, they will eat much more of the mash. When not in production, only small amounts of the mash will be consumed.

It is good practice to feed the moistened mash to the birds that have practically completed their growth, as forcing immature pullets into early production will result only in the temporary production of smaller eggs. A good feeder watches his birds' body weight and when they have made their growth he forces them into production and at the same time attempts to keep up their

body weight. It should be kept in mind that mash makes eggs and that whole or ground cereal grains make fat. By feeding a proper balance of mash and grain, egg production and body weight can be maintained. If the proper balance is not maintained, the birds may go into a molt lasting from 6 to 10 weeks or longer, and it is often very difficult to get the birds back into production in extremely cold weather.

Some prefer to moisten the mash with liquid skim milk or buttermilk which increases palatability and stimulates consumption. In cold weather, it would be advantageous to warm the milk or water before mixing with the mash. In general, the more mash that the birds can be encouraged to eat, the greater will be the egg production. Regularity is important and it is necessary that this practice be continued once it is started.

### Using Electric Lights in the Poultry House

**Purpose.** Lights are used chiefly for the purpose of getting more fall and winter eggs at a time when eggs bring the highest prices. Lights are also used to hasten body maturity among pullets, encourage early egg production, prevent molt in old and young birds, and maintain egg production. Lights are most commonly used, for pullets, from October to March, and for hens, from September to March.

**Lighting Practices.** Lights are used to provide a 13 to 14 hour day. To accomplish this, the following systems are practiced:

**Morning Lights Only**—Lights turned on at 3:30 a.m. and off at daylight.

Preferred to other systems.

**Morning and Evening Lights**—Lights turned on at 4:30 a.m. and off at daylight, and also turned on at dusk and off at 6:00 p.m. Dimmers would be required in the evening with this method.

**Evening Lights Only**—Lights turned on at dusk and turned off at about 8:00 p.m. Dimmers required.

**All Night Lights**—Light is available at all times, but a lower wattage is used than with other methods. This is more costly than other methods.

**Evening Lunch**—Lights turned on at 8:00 p.m. and off at 9:00 p.m. No dimmers required. Before lights are turned out, chickens soon learn to go back to roost after getting their feed and water. This is perhaps the most economical method so far as cost of electricity is concerned.

**Amount of Light and Equipment Required.** A 40-watt lamp should be equipped with a cone-shaped reflector 16 inches in diameter at the base and four inches high. The reflecting surface is covered with aluminum bronze. At the height of six feet, this light gives the desired intensity over an area of approximately 200 square feet. To arrive at the number of lights required in a given pen, divide the number of square feet of floor space by 200. The nearest whole number obtained will give the number of lights required. Lights should be located in a line, midway between the front of the house and the dropping boards, and spaced so that the distance between lights is twice the distance from the end lights to the end of the pen. This system of lighting the whole pen is used with all methods except where all night lights are used.

**Management Practices With Lights.** Plenty of feed and water should be available at all times. Water should be heated if this is necessary to keep from



freezing. Encourage the consumption of mash by moistening the laying mash with water or milk. If birds are losing weight, add corn meal to the mash. Regularity in the use of lights and feeding is very important. When evening lights are used dimmers are required so that the birds will be given time to get up on the roosts before the house is dark.

**Electric Clocks.** The diagram in Figure 12 will suggest how an alarm clock may be used to turn on the lights.

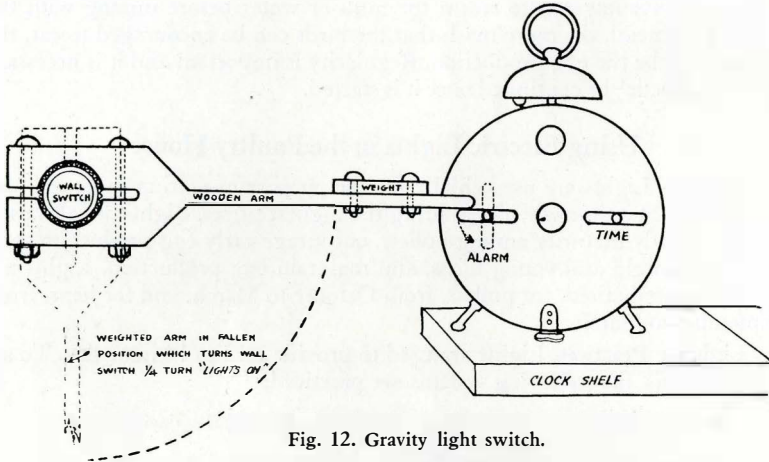


Fig. 12. Gravity light switch.

## Home Made Equipment

The club member handy in building things will be able to make the greater part of the equipment necessary to care for his poultry. If one were to buy all necessary equipment, the overhead would be so great that unless exceptionally good results were obtained, no profit would be made.

### Chick Feeders

Chick mash hoppers may be constructed of four-foot plaster lath, as shown in the above photograph (See Figure 13, left half of picture.) Four laths form the hopper. The center lath is set on edge to keep the chicks out of the mash. This hopper will provide enough feeder space for 50 chicks and may be used for the first three weeks. The large mash hopper in Figure 14 should be used for chicks three weeks of age to ten weeks. Use one four-foot hopper for each fifty chicks.

### Bill of Material

1 piece 1 in. x 4 in. x 5 ft.	1 piece 1 in. x 1 in. x 4 ft.
2 pieces 1 in. x 2 in. x 4 ft.	2 pieces plaster lath

It is advisable to place the water founts and feed hoppers on stands, so the chicks cannot scratch litter into the feed. The stands should be

covered with one-half inch mesh hardware cloth. The use of such equipment prevents the feed from becoming contaminated and, also, prevents the chicks from coming into contact with damp litter under the water containers thus helping to control disease.

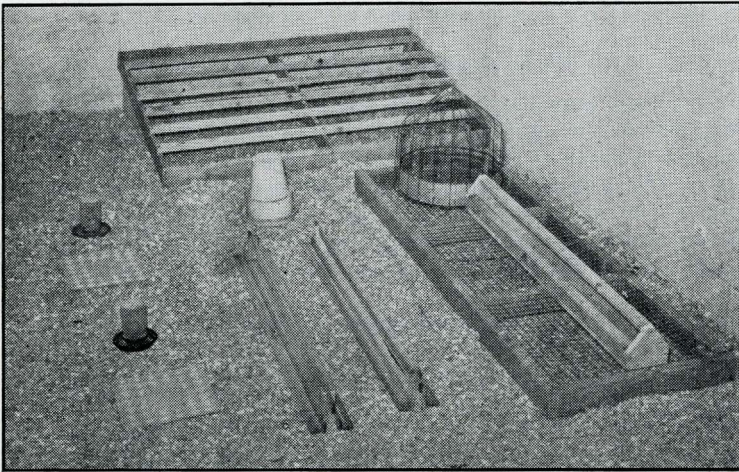


Fig. 13. Home-made brooding equipment. Note roosting frame.

### Watering Fountains

One of the big problems is to keep a supply of fresh, clean water at all times. For small chicks, a convenient watering fountain may be made using a gallon pail and a pie tin.

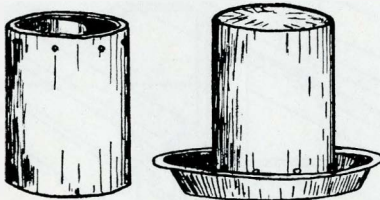


Fig. 14 Watering fountain made from gallon syrup pail and pie tin.

pail just below the upper edge. Fill the pail with water, turn the pie tin over the top, hold firmly in place and invert. Be sure that the holes are not too far from the top of the pail or they will come above the edge of the pie tin causing it to overflow and waste the water. These fountains are easily cleaned and disinfected.

### Roosts

Teach the chicks to roost while in the brooder house. If you don't, chicks which should be on the roosts will be crowding on the floor. Rigging up brooder house roosts each year is a job very easy to neglect. It is

easier to build movable permanent roosts as shown in Figure 13 and have the job done for several years. The size of the set of roosts depends on size and shape of the brooder house. One by two-inch boards should be used for the perches. The sides and center supports can be built from one by fours. When the frame is completed, turn the frame up side down and tack the mesh wire to the underside of the perches to prevent sagging.

### Mash Hoppers for the Laying Flock

There are numerous types and styles of mash hoppers for use in the laying house. The open trough type protected by wires and which holds sufficient quantity to last for about two days has been found very satisfactory. The mash being visible in the open hopper encourages greater consumption of mash. Also, the fact that it is fresh, being replenished frequently, encourages greater consumption of mash with correspondingly greater egg production. The hopper should be long enough to afford

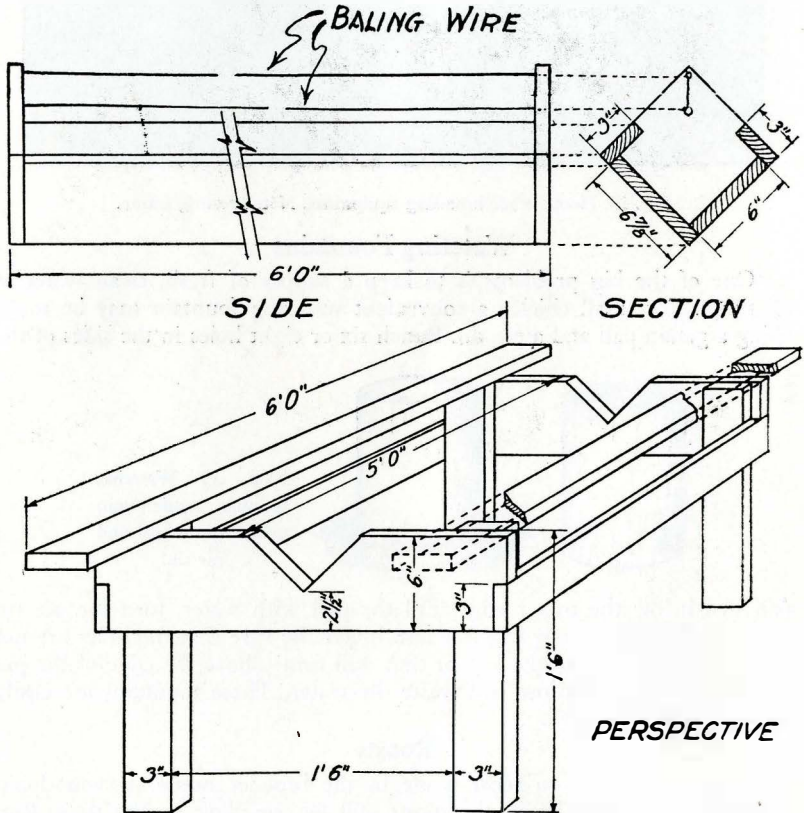


Fig. 15. Practical reel type mash hopper for laying hens.



plenty of feeding space for the flock. A hopper which allows the hens to eat from both sides should be one foot long for every eight birds in the flock. The mash hopper should be raised about 20 inches from the floor. This prevents the hens scratching litter into the mash and also conserves valuable floor space. Figure 15 shows a very satisfactory indoor mash hopper for the laying house.

### Crate for Catching Birds

A catching crate is a great convenience in poultry work, and every up-to-date poultryman should have one. The sketch (Figure 16) is self-explanatory. A bottom is not required in the crate, unless it is to be used in moving

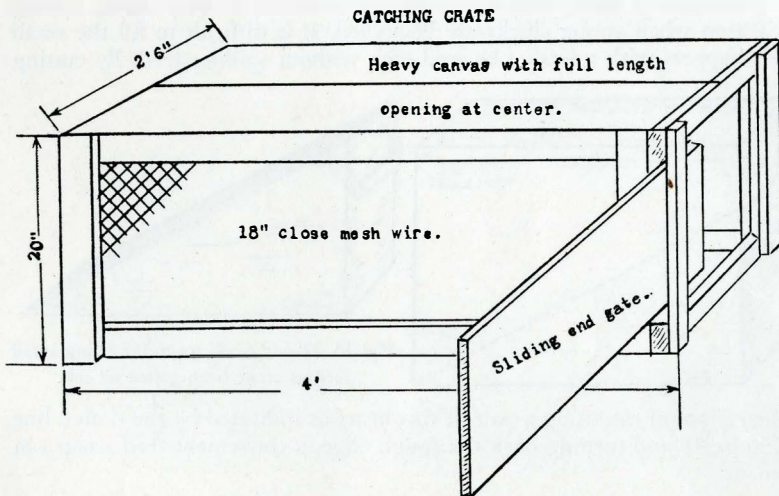


Fig. 16. A handy catching crate.

birds. The birds are removed through the opening in the center of the canvas top. The crate is placed outside the poultry house, before the hen runway; or it may be used at an ordinary doorway by suspending a canvas or blanket from the top of the door frame to the top of the crate. If the crate is constructed larger than  $2\frac{1}{2} \times 4$  feet it does not prove so satisfactory, as the distance required to reach for the birds becomes too great. Four old inner tubes slit open and tacked or overlapping each other about three inches will serve as good a canvas top.

Material required for construction of catching crate:

- |                                           |                                          |
|-------------------------------------------|------------------------------------------|
| 4 pieces 1 x 4, 4 feet long.              | 11 lineal feet 18-inch close mesh        |
| 4 pieces 1 x 4, $2\frac{1}{2}$ feet long. | chicken wire.                            |
| 8 pieces 1 x 4, 20 inches long.           | 1 lb. 6D box nails.                      |
| 1 piece 1 x 12, 3 feet long.              | $\frac{1}{2}$ lb. 6D box nails.          |
| 1 piece heavy canvas, 3 x 4 feet.         | $\frac{1}{2}$ lb. chicken fence staples. |
|                                           | 1 box double point tacks.                |

A catching hook, as shown in Figure 17 is a handy article to have in the poultry house for the purpose of catching one or two individual birds. This hook is made by fastening a piece of heavy wire to the end of a broom

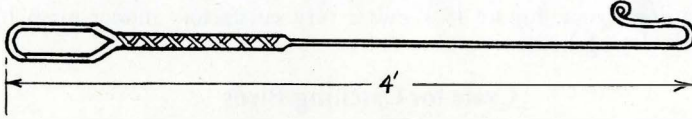


Fig. 17. Catching hook made from heavy wire.

handle or stout stick about that length. It is not advisable to use this type of catcher when the entire flock is to be handled.

A number of small feed scoops will be found to be very handy during the season when young chicks are being fed. It is difficult to fill the small mash hoppers with a bucket or feed sack without spilling feed. By cutting

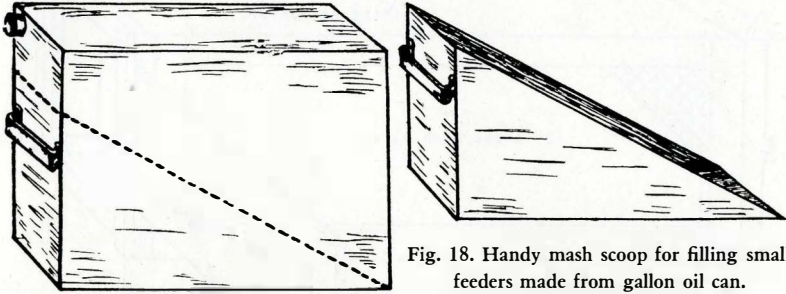


Fig. 18. Handy mash scoop for filling small feeders made from gallon oil can.

a one-gallon oil can using a pair of tin shears as indicated by the dotted line in Figure 18 and turning back the rough edge, a convenient feed scoop can be made.

### Nests and Watering Fountains for Laying Hens

A good poultryman will save himself a lot of labor by constructing nests which are easily cleaned and disinfected. The battery type of nests which are shown in Figure 9 page 14 are attached to the wall by a pair of strap hinges. The wall of the poultry house serves as the back of the nests. To clean, the nests are pulled away from the wall and by lightly shaking the nesting material and all dirt drops out at the rear. When scrubbing the laying house, the nests can be easily removed by taking out the pins from the hinges.

Plenty of clean water must be kept before the hens at all times. A three-gallon heavy galvanized pail makes a good water fountain. An advantage of using a pail is that when the pail is used to carry water, it is more likely that the water container will be kept clean as it is easy to rinse out the pail daily. In order to avoid a sloppy, disease-breeding floor around the bucket, a water stand as shown in Figure 9 page 14 should be built. This will prevent the hens from tipping the pail over.

## Sanitation and Diseases

The extensive use in recent years of artificial and wholesale methods of incubation, brooding, housing, and feeding has increased the disease problems at an alarming rate so that success or failure in poultry raising now depends on controlling mortality in the laying flock as well as raising a large percentage of the baby chicks.

Normal, healthy chickens do not require drugs of any kind. When an outbreak of disease occurs in a flock, the first step is to get an accurate diagnosis. This can be done best by your local veterinarian. If you cannot get your local veterinarian, it is a good plan to write to the Veterinary Department, South Dakota State College, Brookings. Explain fully how your chickens have been fed and managed, and the sanitary conditions in the poultry house. You should, also, explain in detail the symptoms you have observed among the sick birds. If the disease is contagious, all such birds should be removed from the flock, and the poultry house should be cleaned thoroughly and clean litter put in the house.

### Germs Cause Disease

Contagious and infectious diseases are caused by very small organisms commonly known as germs. Poultry diseases do not just "happen," they must

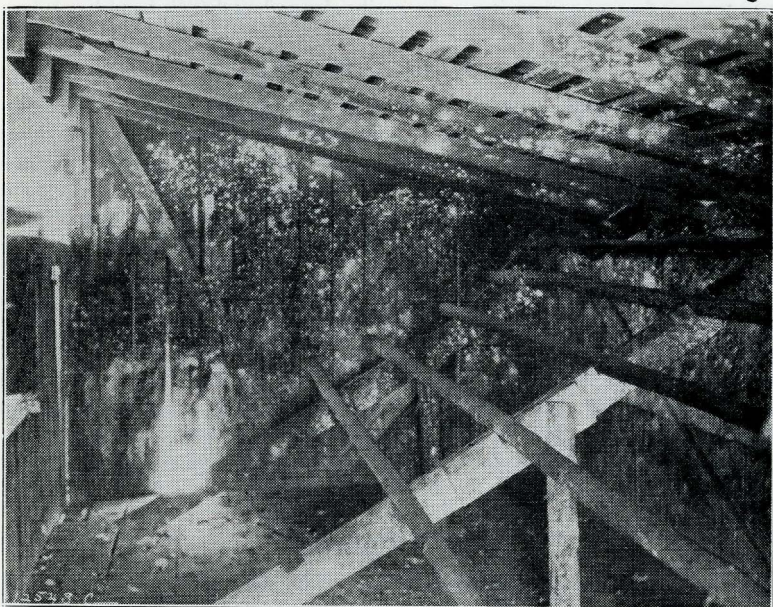


Fig. 19. Unimproved poultry house, unsanitary. Roosts should be taken out and replaced with dropping boards or a dropping pit.



be carried into the flock in some manner, and usually result from the lack of proper sanitation.

The first rule of health is sanitation. The observance of this rule is outlined by the following points:

1. Quarantining of all new stock. Breeding males and birds returned from poultry shows should be penned up for three weeks before being placed with a healthy flock.
2. Protect the flock from drinking dirty water, spoiled or infected feeds, and keep birds from running on infected ground.
3. Burn all dead birds or bury them four feet in the ground.
4. Thoroughly clean and disinfect the brooder house and laying house before housing the birds.
5. Protect the flock from vermin, diseases and parasites carried by free flying birds.
6. Prevent persons who have sick poultry or salesmen from entering the poultry house or yards.

Good feeding is the second rule of health. Some diseases are caused by a ration lacking certain elements, while others are caused by excessive feeding of some feeds. Rickets, nutritional roup and polyneuritis are caused by rations which lack certain vitamins. A good ration is essential for health, growth and egg production.

The third rule of health is good housing. The poultry house should not be over-crowded, and should be well-ventilated and free from drafts or dampness, and arranged so it can be easily cleaned and disinfected.

### **Cleaning and Disinfecting**

Good disinfectants properly used after the poultry house and equipment has been thoroughly cleaned, will destroy the germs of contagious diseases, and in some cases, external parasites such as lice and mites. Disinfectants have little if any value, if all the dirt and other filth has not been removed. It is important to give special attention to the cleaning of the premises, and the removal of all litter and manure before applying disinfectants. Scrubbing the floors, sills, side walls, roosts and all equipment with boiling hot lye water (one pound can to 10 gallons of water) is perhaps as good a disinfectant as can be recommended. After the lye water has been used, many poultrymen mix up a five percent solution of creosote and spray the interior of the house and all equipment. This solution is mixed by adding 12 tablespoonsful of the concentrated disinfectant to one gallon of hot water. The mixture should be milky-white in color. Disinfectants are most easily applied to walls and ceilings with a spray pump or with a brush.

### **Control of Lice and Mites**

Much harm is done to young poultry each year by lice and mites, for birds infested by these parasites cannot make a normal growth. Infestation by these parasites, also, greatly reduces the natural resistance of the bird to disease. If chicks are hatched in incubators and raised on clean

ground and in clean brooder houses, they may escape these pests until placed in a poultry house that has not been properly cleaned.

Poultry lice and mites differ widely in their habits and characteristics. Lice have large biting mouth parts. They do not suck blood, but eat scales of skin and the scaly part of the base of the feathers. Lice stay on the body of the birds at all times. Mites are blood-sucking insects, and hide in the poultry house during the daytime and come out at night and suck blood from the fowl. Mites rarely stay on birds during the daytime.

The Northern fowl mite is common in South Dakota and may easily be mistaken for the common roost mite. It has many habits of both the body louse and roost mite. It lives and reproduces on the fowl and gets its food by sucking blood from the host. Black leaf 40 treatment is an effective method of control but treatment must be repeated at intervals of three days.

### Lice

Laying hens should be examined for lice at regular intervals and given a thorough treatment if discovered. Lice can be found by looking under the wing or below the vent. They irritate poultry to a great extent, and in the case of young stock cause bowel trouble as well as other diseases.

**Treatment.** There are several treatments for body lice, namely:

1. Nicotine sulphate or Black Leaf 40
2. Sodium fluoride in the powder form
3. Sodium fluoride used as a dip

Nicotine sulphate or Black Leaf 40 has been found effective in the treatment of body lice on poultry. The solution is placed in an ordinary oil can like any of those used to lubricate farm machinery. A narrow but continuous ribbon or stream of the solution is applied to the upper side of the poultry roosts about one-half hour before the birds go to roost. The roosts should be cleaned before the Black Leaf 40 is applied. The heat of the fowls' body causes the fumes of the nicotine sulphate to rise and penetrate the feathers which kills the lice. A second treatment is necessary 10 days later in order to kill the young lice which may have hatched after the first treatment. Care should be taken to see that all the birds are on the treated perches because one or two birds that are not treated will reinfest the flock.

Black Leaf 40 can be used to treat individual birds by using a small dropper and applying one drop of this liquid on the head, under each wing, on the back, on the breast and under the vent. This method is preferred by many poultrymen.

Sodium fluoride may be purchased at most drug stores and is commonly applied by what is called the pinch method. Place the powder in a bowl, take a liberal pinch between the thumb and four fingers, and apply to the birds as follows: One pinch on the head, one on the neck, two on the back, one on the breast, one below the vent, one on each leg and under each wing. Care should be taken to see that the powder is distributed among the feathers next to the skin.

When used as a dip, two level tablespoons or one ounce of sodium

fluoride is required to each gallon of water. The water should be warmed to a temperature of 100 to 105 degrees and soft water is preferable. Dipping is not satisfactory unless it is done in the forenoon of a very warm day, which will allow the birds to dry thoroughly before going to roost. In dipping be sure that the feathers are thoroughly wet. Place the thumb and index finger over the nostrils of the bird and dip the head, holding it under for three or four seconds. Change the water frequently enough to keep it reasonably clean. Stock dip is not suitable for this use.

Black Leaf 40 and sodium flouride are poisonous and should be kept away from children.

### Mites

To combat mites an application of oil insecticide must be made in the poultry house or brooder house. First, thoroughly clean the house to be treated. Remove all loose equipment. Paint or spray the dropping boards, roosts, the poultry house walls immediately back of the roosts and the nests



Fig. 20. Fowl with scaly leg.

with carbolineum or wood preserver. One application of this material will rid the house of mites for one year. Three parts of waste motor oil and one part kerosene can also be used but it is not as lasting and must be repeated



every two to three weeks during the warm months. It is usually neglected and for this reason generally proves unsatisfactory.

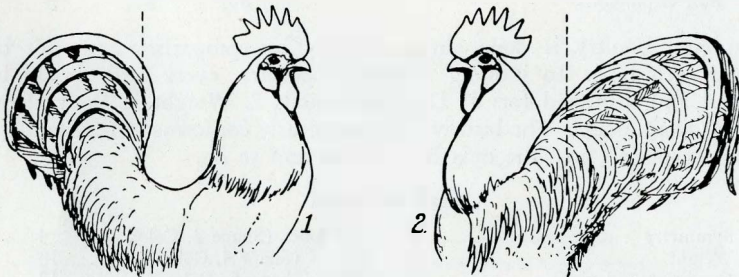
Look for mites in the poultry house early in the spring. They may be detected by a grayish scale found at the point where the roosts rest on the cross member, or by holding a lighted match at this point mites will be driven out if present. Mites multiply very rapidly in warm weather and by waging war on them early in the spring the trouble is greatly lessened in the summer. Mites are very hardy and may live in a poultry house for six months to a year without food.

Another species of mite causing trouble is the scaly leg mite. This mite works under the scales of the feet and shanks of the bird causing a pus to form which hardens, forcing the scales outward, making the bird's foot look rough and in many cases causing the scales to come off entirely.

Treatment for this mite is very simple. Nail a gallon pail to the poultry house wall at a convenient height to work. Fill the pail with three parts waste motor oil and one part kerosene. Catch the birds and dip their feet and shanks in the solution up to the feathers. Do not get the oil above the line of feather growth as it will cause them to come out. Presence of the scaly leg mite is an indication of a shiftless poultryman.

## Poultry Judging

Practically every county in the state offers club members a chance to exhibit their birds at some time during the year. County 4-H Club Achievement Days are planned each year to provide a place to exhibit the best birds from each project. At the State Fair held in Huron in September, there is a special class for 4-H poultry exhibits. Every club member should strive to learn all that is possible about poultry judging. (The knowledge of judging is necessary in order that a club member can select good breeding birds and be able to cull out poor producers from the flock.)



*MALES WITH DEFECTIVE TAIL CARRIAGE.*

*1 SQUIRREL*

*2 WEY*

Fig. 21. Males with defective tail carriage.

### Judging Exhibition Poultry

Exhibition judging is based on the ideal shape, symmetry, utility value and color of the different breeds and varieties as fixed by the American Standard of Perfection. In order to intelligently judge poultry, it is necessary to know the standard disqualifications, which are defects so serious that a bird with such is not allowed to place in a show.

1. Specimens unworthy of a score or lacking in breed characteristics.
  2. Faking or an attempt on the part of an exhibitor to deceive the judge.
  3. Deformed beaks.
  4. Crooked or otherwise deformed backs.
  5. Wings showing clipped flights or secondaries, or both.
  6. Split wing, showing a decided gap between primaries and secondaries.
  7. Twisted feather, with quill or shaft twisted (wing feathers).
  8. Entire absence of main tail feathers.
  9. Wry tail: Tail of a fowl turned to one side permanently.
  10. Squirrel tail: Any portion of which projects forward beyond a perpendicular line drawn from the back.
  11. Combs foreign to the breed.
  12. Split comb: A single comb which is divided perpendicular with two parts overlapping.
  13. Side sprigs: A well defined, pointed growth on the side of a single comb.
  14. Absence of spike in all rose-comb varieties.
  15. Positive enamel white in the ear lobes of all American, Asiatic and English Varieties.
  16. Stubs or feathers on the shanks of clean shank varieties.
  17. Plucked hocks.
  18. Shanks or feet of color foreign to the breed.
  19. Brown or black in quills of primaries and secondaries of white varieties.
- No bird should be selected for County Achievement days or other fairs that shows any of the above mentioned disqualifications.

### Standard Weights

	Cock	Cockerel	Hen	Pullet
Leghorns	6	5	4½	4
Rhode Island Reds	8½	7½	6½	5½
Wyandottes	8½	7½	6½	5½
Plymouth Rocks	9½	8	7½	6
Buff Orpingtons	10	8½	8	7

Judging poultry is done almost entirely by comparison and not by scoring each bird. In judging a class of poultry, every bird should be handled and inspected for: 1. Disqualifications 2. Weight 3. Body shape 4. Color of plumage. The bird which most nearly conforms to the standard should be placed first, the next bird second and so on.

### Scale of Points

Symmetry .....	4	Ear lobes (Shape 2, Color 2) .....	4
Weight .....	4	Wings (Shape 4, Color 6) .....	10
Condition and vigor .....	10	Back (Shape 6, Color 6) .....	12
Comb .....	6	Tail (Shape 3, Color 3) .....	6
Beak (Shape 1, Color 1) .....	2	Breast (Shape 6, Color 6) .....	12
Head (Shape 2, Color 2) .....	4	Body and fluff (Shape 5, Color 3) ..	8
Eyes (Shape 2, Color 2) .....	4	Legs and toes (Shape 4, Color 4) ..	8
Wattles .....	2	Neck (Shape 2, Color 2) .....	4

## Judging For Egg Production (Culling)

Utility judging, or the selection of hens for egg production and removal of the poor layers, is frequently referred to as "culling." Culling should be started as soon as the chicks are hatched. Weak, deformed, or diseased birds should be removed from the flock whenever observed. Culling is usually considered the systematic elimination of poor layers from the flock. In order to cull chickens intelligently, there are certain factors that must be considered in order to determine whether or not a hen is a good producer.

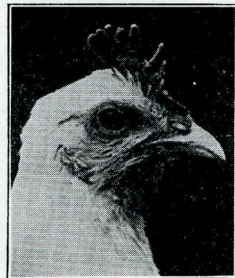
**Time to Cull.** From July to October, is usually the best period if the hens are to be culled only once. Poor layers as well as good layers will lay during April, May and June. By July, the poor producers will have stopped laying and will begin to molt. The profitable hen will continue to lay on into the summer and fall.

### WHY CULL?

1. To increase egg production.
2. Reduce feed costs and provide more room for the good producers.
3. Reduce losses from disease. Many hens quit laying because they are sick.
4. Improve quality of breeding flock.



Fig. 22. How to tell a good layer from a poor one by head points. Note the large comb, thin lean face, and full white earlobes on the hen to the left.



## How to Distinguish the Layer From the Non-Layer

### The Good Hen

Large, red, glossy, warm and full

Large, moist, dilated, white

Prominent, soft, smooth

Thin, flexible, wide apart

Soft, pliable, and deep as measured from keel to pelvic bones

### The Comb

Small, scaly, round, dry

### The Vent

Small, contracted, dry and yellow

### Wattles and Lobes

Small, dry, rough

### Pelvic Bones

Thick, rigid, close together

### Abdomen

Hard, thick contracted and small distance from keel to pelvic bones.

### The Poor Hen



### Judging for Past Production

Utility judging has no set standards, but rather many physiological factors must be given consideration. The fact that a hen is laying at the time of examination is no sign she is a good producer. Allowances should be made for the time of year, age of the bird and feeding and management.

**Pigmentation.** By pigmentation is meant the yellow coloring matter which is found in the fat of yellow-skinned breeds. It is visible in the skin, vent, beak, and shanks. With pullets just starting to lay, it should be deep rich yellow, but the color will vary depending on how the birds were fed and managed. Yellow corn and green feed will produce yellow pigmentation; whereas, feeds such as wheat, barley, oats, and millet will produce very little yellow coloring.

When the pullet begins laying, the yellow color which she receives in her feed is put into the yolk of the eggs. The yellow pigment in the feed and from the hen's body is thus used in the formation of eggs and the more eggs a hen lays, the less yellow coloring will she have in her body.

The yellow color leaves the vent first after four or five eggs have been laid, and is usually entirely bleached within 15 days. The eye ring or edge of the eye is next, and it is white after 10 to 12 eggs have been laid. The earlobes usually lose their yellow color after 15 to 20 eggs have been laid. The base of the beak is next to lose its color, and after 40 eggs have been laid, the beak becomes pearly white. The shanks lose their color last. The front of the shanks fade before the rear. A hen which has all the yellow color gone from the shanks has been laying for five or six months, and has produced over 120 eggs. When a hen stops laying, the color returns in the same order it disappeared, but more rapidly.

**Molt.** The time of the year that a hen molts and the length of time it takes her to complete her molt, are important points to consider in culling chickens. The early molter (June, July and August) is generally a poor layer, while the late molter (October and November) is usually a good layer. It is natural for a hen to molt or change its feathers every year. Growing new feathers requires food material and as a result, the hen stops laying until a set of new feathers is grown out.

The rate of molt will influence the time out of production. A hen has usually 10 primary feathers, and these feathers molt in definite order along with the other body feathers.

The length of time a hen has been molting may be determined, since we know a new feather requires about six weeks to become full length. The first primary feather next to the axial feather is dropped first, two weeks later the second is dropped, and so on. A hen molting one primary at a time will require 24 weeks to complete its molt. This is counting six weeks for the first, and two additional weeks for each of the remaining nine primaries. Poor producers seldom molt more than two primaries at a time, and usually require 14 to 16 weeks to complete the molt. Hens that are late molters usually molt at a rapid rate dropping three or four primaries at one time, and are seldom out of production over eight weeks.

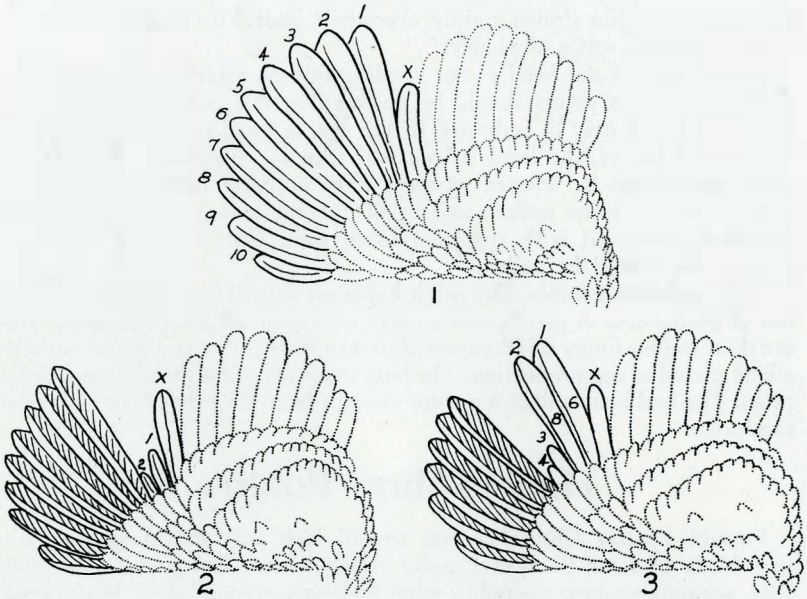


Fig. 23. Diagram No. 1 shows a normal wing before molting. The axial feather is marked X. The primary feathers are numbers 1 to 10. The feathers on the other side of the axial are secondary feathers. Diagram No. 2 shows the beginning of a slow molt. Numbers 1 and 2 are new feathers. Diagram No. 3 shows a wing in its eight-week molt. Feathers 3 and 4 are not counted until fully grown.

An early slow molting bird, if she has received good care and management, should be culled from the flock. In utility judging, if it is a question of choosing between two birds, both of which are out of production, the one showing signs of having ceased production last should be considered the better of the two.

**Body Capacity.** Body capacity is not measured by the weight of the bird, but rather it is essential that a good layer have adequate body size and capacity to properly accommodate her digestive and reproductive organs. This is measured by the width between the pubic and keel bones. The width of back and fullness of breast might well be considered, however, it must be kept in mind that physical measurements are not an accurate method of determining the productive ability of a hen but they should be considered.

**Handling Qualities.** This may be referred to by different names, but it is a point that should be considered in judging birds for egg production. Certain hens even at the end of the laying year show a tendency to cover the body with fatty tissues. This is particularly true in the regions of the abdomen, pubic bones and the nape of the neck.

Certain hens tend to convert the nutrients of the feed into body fat and retain it rather than to convert the nutrients into eggs. Hens of this

type have the skin drawn tightly over their body. In the good layer, the skin is smooth, soft and pliable.

The shape of the head is not a safe guide on which to base egg production, but two points should be observed in this connection. First, the health of a bird may be indicated by the eye. A good producer usually has a large bright eye, the head is lean and trim in appearance. A poor producer may often be selected as some have a coarse beefy head and the eyes often tend to be sunken and small. Second, a long crow-headed bird should be observed with suspicion as in most cases they are poor producers and should be culled.

**Keel and Pelvic Bones.** The pelvic bones are turned inward when a bird is out of production. A good producer will have thin, pliable pelvic bones that are three to four finger widths apart, and they will tend to straighten out after a long period of egg production. The fatty tissue deposited around them disappears. The keel bone will be a greater distance from the pelvic bones in a good producer.

## How to Show Poultry

Four-H Poultry Club members should look forward to showing the best birds of their flock at County Achievement days and at the State Fair, not only to show the public what they have accomplished, but in order that they may complete the work required for the year.

### Selection of Good Type Poultry

The first selection should be made when the chicks are 8 to 10 weeks of age, for in practically all flocks there are a few outstanding chicks that make a more rapid growth and show more vitality than others. These birds should be caught and examined for standard disqualifications, size, shape and breed characteristics. A good plan is to band these birds so they can be given special attention during the summer. No bird is perfect, so the ones having the least number of defects should be selected.

### Preparations for the Show

Birds exhibited should be clean, as cleanliness is an important factor in show condition. White, part white, and buff birds should be washed if their feathers are soiled. If birds are selected early and are confined for one week in a brooder house or some other small building having a deep layer of clean straw (10-12 inches), the birds will clean their feathers and be in excellent condition for show. Only the head, feet, and shanks must be washed.

**Temperature.** In cool weather the washing should be done in a room having a temperature between 70 and 80 degrees.

**Time.** If possible, do the washing the day before shipping. It is best to wash early in the day to give the birds plenty of time to dry before night.

**Coops.** Have the exhibition coops ready with cloth or paper covering



the top, both sides and one end to prevent all drafts. Put a thin layer of clean straw, hay or shavings in the bottom of each coop.

**Tubs and Water.** Arrange three or four tubs at the right height for you to work easily, and then fill each about two-thirds full of clean, soft water. The first two tubs of water should be quite warm, 100 to 105 degrees. If hard water is used it should first be cleansed as in laundering clothes.

**Soap.** A good white toilet soap or a high grade white laundry soap will be found satisfactory. Dissolve in hot water until a soap jelly is formed. Put enough soap in the first tub to form a floating suds.

**Washing.** Wash the face, comb, feet, and shanks by scrubbing gently with a soft brush (a nail brush is very good) using plenty of soap and water. In washing the feet be sure to remove the dirt from under the scales. Next, wet the feathers to the skin before applying enough of the dissolved soap to make a good lather.

**Rubbing.** Be sure to rub the lather with the feathers instead of against them or they may be broken. A soft cloth or sponge may be used, but it is generally easier to use the hands.

When you think the feathers are clean, wash out the lather. Give a second washing if necessary.

Remove as much of the soap as possible in the first tub, then rinse in the second. Any soap that may be left in the feathers will give a stringy or matted appearance, and that is the reason for the third and fourth tubs of rinsing water. Be sure to have the water reach the base of the feathers.

**Changing the Water.** Not more than five or six birds should be washed in the same water. The first tub may be emptied and refilled to serve as the fourth if the water in the outer tubs is not too cool. Not even water in the fourth tub should be cold or the birds will become chilled.

**Drying.** When thoroughly rinsed pat the feathers with a coarse towel or cloth to take up the surplus moisture. Do not have the room so warm that the feathers dry too quickly or they will curl instead of being soft and fluffy.

When thoroughly dry, rub a small amount of vaseline or sweet oil on the comb, wattles, ear lobes, beak, and shanks. This will bring out the true color and give a fine appearance. **Caution:** Do not get the oil on the feathers or use enough so that the bird will get it on its own feathers, as it will soil them by collecting dirt.

**Shanks.** If any dirt remains under the scales of the feet and the shanks, it may be removed with a stiff wire hairpin, the point of a nut pick, or a hardwood stick whittled to a point.

**Shipping.** If the birds are worth sending to the show, they should have a good crate with a thin layer of clean straw or hay at the bottom. The crate should so protect the birds that the feathers will not be broken, especially the tail feathers. A thin cloth should protect them from dirt and dust from above if a slatted top is used. Close the coop securely.

**Feed.** Fasten a tin can or feed cup securely in one corner. Do not put water in the coop as it will slop out and wet the feathers which will allow them to collect dust.

**Address.** Put your **Return Address** as well as the address where the show is to be held in a prominent place on the coop, then trust that you have made a good selection and enjoy the show, whether you win a prize or not.

## Remodeling the Poultry House

Along about harvest time each year we begin to think about cleaning up the old poultry houses and fixing them up for winter. It is impossible to remodel most old poultry houses and ventilate them so they will provide fresh air and at the same time control the frost and moisture on the walls as well as can be done when a new poultry house is built exactly according to a plan. But there are some simple things that can be done for the poultry house that will make it much more comfortable for birds in winter.

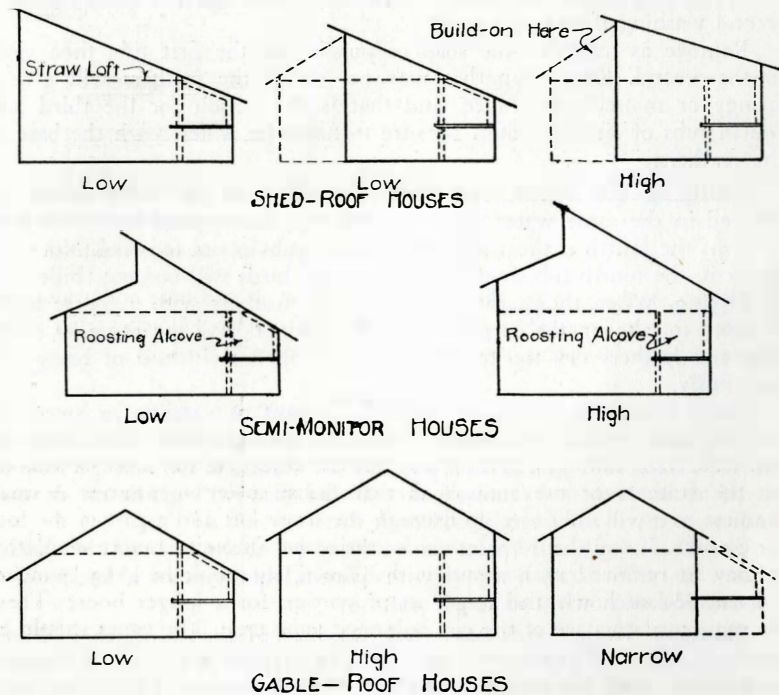


Fig. 24. Diagram showing methods of remodeling shed, semimonitor, and gable roof houses.

## The Straw Loft

There is probably nothing that can be done to make the old poultry house more comfortable than to put in a straw loft overhead. It was a common mistake in years past to build the poultry house much higher than it should have been. If a straw loft is built straight across overhead just high enough to be well out of the way so that it is not necessary to stoop while moving around in the house, the overhead will be reduced and a proper temperature can be maintained. The amount of frost that will gather on the walls will be reduced to a minimum. The straw loft should be made of good, clean straw and loose poles or slats. The reason for leaving the slats or poles loose, or at

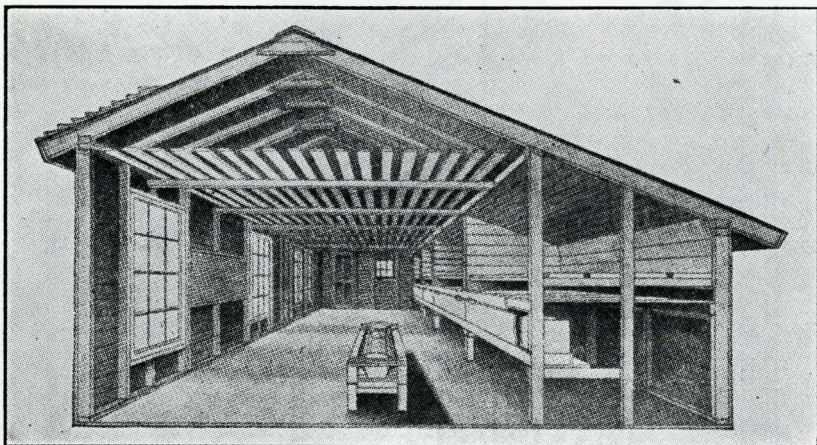


Fig. 25. A laying house must be well insulated and provide adequate ventilation.

least a few of them, is to make it handier to put in and take out straw. The thickness of the layer of straw should be from 10 to 12 inches after it has settled. This will depend upon the amount of room in the loft.

## Ventilation

The straw loft in the poultry house has two purposes. One is to cut down the overhead space in the house, and the other is to aid in the ventilation of the house. A straw loft also makes the house cooler in summer. A small amount of moist air moves up through the straw loft and a part of the foul air as well as a part of the moisture is carried out through shutter ventilators in the ends of the house as shown in the plan. They should be 14 by 14 inches for the 32-foot house and larger in proportion for a longer house. These shutter ventilators are of the old fashioned vane type. The vanes should be set at an angle to protect the loft from the weather as much as possible. Outside the vanes it is recommended that one-half inch hardwarecloth be used over the opening. This will keep out birds. It is sometimes desirable to close one or both of these ventilators in the gable ends of the house in stormy



weather or extremely cold weather. A sliding door can be made on the inside for this purpose, to be operated by a one-by-two inch staff extending down below the straw loft in each end of the house. When pushed up, the door closes the opening.

The greater part of the ventilation for this house is secured through baffle-board shutter ventilators placed in the south side walls. This type of ventilation is entirely different from that of stock barns, but birds are quite different from hogs or dairy cows. These shutter ventilators provide a

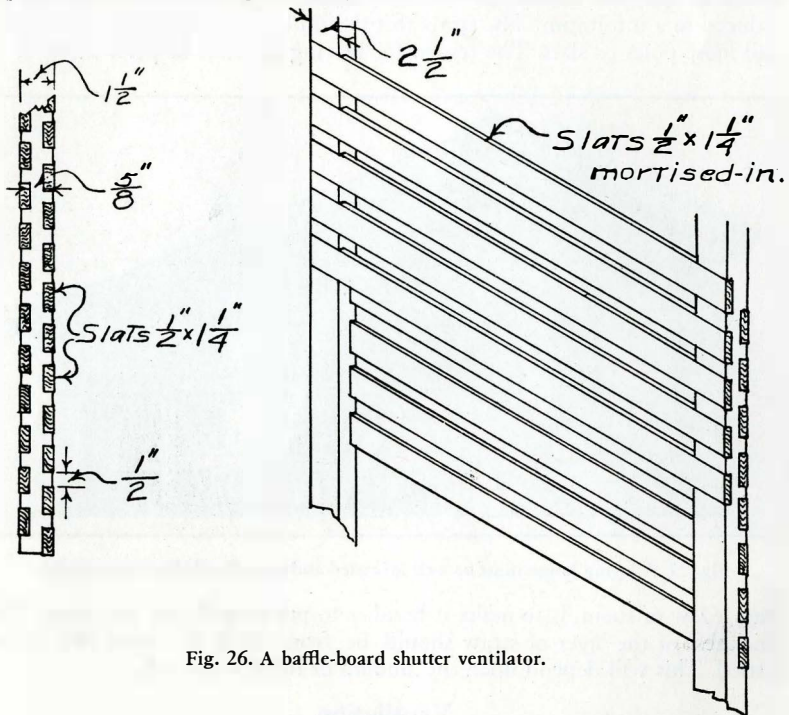


Fig. 26. A baffle-board shutter ventilator.

breathing type of ventilation. The vanes in the baffle-board ventilators are arranged alternately on either side of a frame in such a manner that a wind cannot blow directly through them but will be broken up owing to the position of the vanes. The detail in Figure 26 shows how these shutter ventilators are constructed. Selected plaster lath might be used for slats in its construction. A width of 20 inches is specified because this will be the width of opening between studdings after the cleats or stops are in place to hold the frame in place. The frame of the ventilator should be 22 inches wide. The capacity for them is measured in square inches of frame opening in the wall. From 9 to 13 square inches of frame opening should be provided for each bird that is to be housed. It is not necessary to use exactly the size vanes or slats shown in the plan, but if wider slats are used, comparatively wider openings should be left between them.

These shutter ventilators should be left open practically the year round. In mild weather windows also should be opened for ventilation and only in the most extreme weather will there be a necessity for closing them. For this purpose a burlap or muslin curtain is recommended. This cloth curtain should be rolled up on a curtain pole or broomstick and tied at the top of the window so that by simply pulling the string of the knot, the curtain will roll down of its own weight. The location of the shutter ventilators is recommended exactly as shown in the plan. This is in the center of the south side of the wall, midway between plate and sill.

Ventilation includes the introduction of fresh air into a stock building and a partial control of moisture and frost deposit. A small amount of moisture or frost deposit does not indicate foul air; it indicates a cold side wall. In order to completely eliminate moisture and frost deposit we must eliminate the cold side wall. This is done only by elaborate insulation which is somewhat expensive. The South Dakota poultry house has practically no insulation and, therefore, is an inexpensive house. It has been designed to meet the demand for a satisfactory laying house at a low cost. There would be no objection to elaborate insulation of the walls in this house other than the additional cost.

### **Dropping Boards Aid in Floor Sanitation**

The floor space for birds can be increased by constructing dropping boards. Besides, it is not sanitary to allow hens to scratch on the floor in the droppings. Many common poultry diseases are spread through infected droppings. Allow four square feet of floor space for each hen in the flock.

Dropping boards should be three and one-half feet off the floor and placed in the back part of the house. Have the boards level and run the short way of the roosting alcove to make them easier to clean with a hoe. The boards should extend six inches beyond the front roost. The roosts should be eight inches above the dropping boards. The roosts should be 12 inches apart from center to center. Four or five rows of roosts should be the maximum. Eight to ten inches of roosting space should be allowed per bird.

**The Roosting Alcove.** A modern improvement that is most important and not hard to make is an alcove for the birds to roost in. The plan is that of sealing up all around the roost except in front so that no draft can reach the birds while on the roost. The writer believes this is of greatest importance. Chickens will thrive in quite cold weather providing the air is still. In order to make a protected alcove of this kind it is necessary to seal up underneath the rafters and on the studding back of the roost with a good grade of matched lumber. Ship lap will do nicely for this if it is of good grade. The ends of each alcove should be built tight and of the same kind of lumber. This means that if the roost is more than eight feet long, a partition should be put in at a distance of eight feet all along the roost. This partition does not extend clear across the house but just well across the roost to break any movement of air lengthwise along the roost. The next important thing is to have a horizontal dropping board under the roosts which is described above. It is made of the same good tight lumber so that no draft can reach the birds from below.

# Caponizing

## The Purpose of Caponizing

The greatest advantage in raising capons is the higher price per pound received for them. With their greater weight, this higher price gives a much greater value to the capons at marketing time. When deciding whether or not it is advisable to caponize the cockerels, a careful study should be made as to the market outlets for finished capons. The price and demand for broilers should also be considered. In many cases it may be advisable to caponize only the late hatched cockerels and fatten them for the late winter markets. Before attempting to caponize cockerels which are to be raised and fattened for sale, the beginner should make a careful study of all the factors that influence capon production. Listed below are some facts to take into consideration.

1. Capons require eight to nine months to reach market maturity and must weigh eight pounds or more to command top prices.
2. During the last few years, capon prices on the New York market have usually equalled turkey prices or exceeded them by a few cents a pound during the capon season which extends from early December to March.
3. Capons will consume approximately 50 pounds of feed in eight months.
4. Capons must be pen fattened, since they will not yield good results from crate fattening.
5. Housing facilities must be provided during November, December and January in order for capons to fatten out as prime birds.
6. Capons and cockerels make the same rate of growth during the first six months.



Fig. 27. A farm flock of capons being fattened for market.



### **Breeds for Capons**

Good capons will result only from the castrating of well-bred cockerels. Inferior stock, small and low vitality, will never make choice capons. The caponizing of the light breeds, such as Leghorns or Anconas will meet with little success, as they never attain sufficient size to make choice capons for market. For home consumption, cockerels of the light breeds may be caponized. American breeds make excellent capons, and the English and Asiatics excel as producers of flesh. It is doubtful, though if the average farmer should breed with the sole purpose of producing meat. It will usually prove more profitable to breed a type suited to egg production and to regard the capons as a side line. However, where one intends to breed especially for prime capons, egg production can be sacrificed to get heavier muscle development and larger birds.

Cross-breeding for capon production has met with excellent results. Cornish males are very commonly used, owing to the remarkable development of breast and thigh. These, bred to females of the Brahmats, Orpingtons, or American breeds, produce excellent cockerels for caponizing. Care must be taken, however, to breed the most desirable individuals of each breed, and the crossbred pullets should never be used as breeders. They should be sold as broilers. The crossbreeding pertains to specialized capon production only.

### **Instruments**

The selection of good, reliable instruments is the first requirement for success in the caponizing operation. The essentials are a good knife, dilators, a tearing hook, and removers. It must be remembered that these instruments are finely made and should receive good care to insure the best results from their use.

1. The knife should be one of good material which will retain a keen cutting edge. The shape preferred is one with a sharp tapering point, and the knife should have a handle sufficiently large to permit a firm hold on the instrument.

2. The dilator is used to open the incision. Care should be taken to secure one which is not clumsy and too severe. One which can be opened to varying widths and lock there is preferable.

3. The tearing hook is not so important as its use is limited to the tearing of the membranous tissues.

4. The remover should be so designed that too large an incision is not required. It should be well made and of a type that will quickly envelop the testicle and remove it entirely, leaving no bruised or cut tissue, adhering. This is the most important instrument and care should be taken in the selection of one which is reliable.

### **When to Operate**

The important factor in securing best results is to have the birds at the right stage of development at the time of operation. This is not a matter of

age or weight, but is rather a stage of sexual development. This varies in the heavy breeds between the ages of 6 and 12 weeks. In the light breeds, the operation must be performed while the cockerels are much younger. The indication for this time determination is the fact that the testicle starts to grow and develop at the same time the comb and wattles start to show development. The proper stage is just as the chicks start to show sexual development and as the comb commences to grow. At this time, the testicle is at its best size and stage for removal. It should be about the size of a large, plump grain of wheat, or a little larger. There is a period of from ten days to three weeks in which the operation can be made successfully. After that time the birds are harder to "work" and more slips and deaths result.

### Preparation for Operation

Birds should be starved for at least 24 hours before the operation. This is to reduce the bulk of the intestines and leave more room for working and less obstruction to the vision. Water need not be withheld longer than five to six hours before operating.

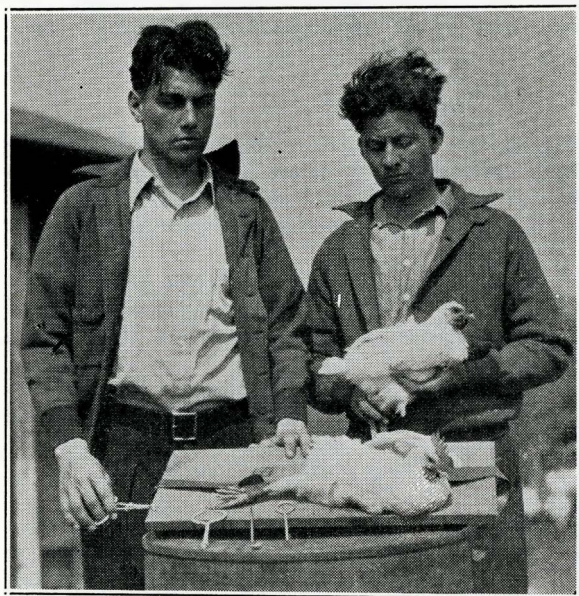


Fig. 28. Showing method of holding cockerel on caponizing table.

A board about  $2\frac{1}{2}$  feet long and 10 inches wide placed upon a barrel makes a handy operating table. Select some sheltered place outdoors, but where the sun shines brightly. The sunlight is needed to furnish light for the operation. Procure a shallow pan in which the instruments can be placed. Use only clean, tepid water. No smelly disinfectant is needed.

### Method of Holding the Bird

The bird is held securely in place on the board by rubber straps cut from an old inner tube. The straps should be one inch wide and about 18 inches long. The diagram will give a general idea of the shape of the strap. It is cut so that a slip noose can be made in one end to go round the wings or legs, the other end having a series of holes punched to fasten on a small nail driven in either end of the operating board.

In cutting the rubber straps see that the double or vulcanized strip in the tube forms the head or upper edge of the slip noose. This reinforcement will prevent tearing.

This method is simple, quick, and humane, as the rubber is elastic, and being broader, does not cut like a string. No clumsy weights are needed.

Two boards and two sets of straps will increase the operating speed. While one bird is being operated on, the helper can be placing another on the second board.

The board being loose on top of the barrel it can be turned or tilted to get the best light on the work.

There is a two-fold purpose in using this method of securing the bird. The cockerel is held to prevent struggling, and the stretching removes the muscles of the thigh from the seat of the operation.

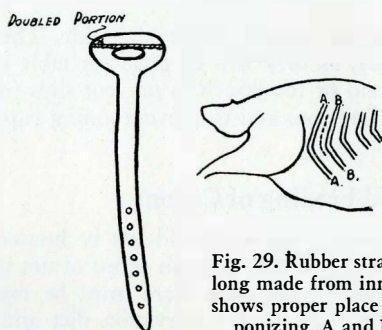


Fig. 29. Rubber strap 1 inch wide, 18 inches long made from inner tube. The dotted line shows proper place to make incision for caponizing. A and B are the last two ribs.

### The Operation

After the bird is secured a few feathers are plucked off immediately in front of the hip-joint, leaving a space about an inch or an inch and a half square.

By manipulation, the location of the last two ribs can be discovered. The incision is made between these two, starting at a point slightly lower than the point of the hip joint and extending down for about an inch.

On determining the location of the ribs, draw the skin slightly to the rear, press the nail of the forefinger between the ribs, and insert the blade along the side of the nail. Press down hard and draw toward you, forcing the blade clear through in the one attempt. This saves time and causes less bleeding. Insert the dilator, opening the incision up to a convenient



size. The omentum, a thin membrane, still hides the organs. This is torn away with the tearing hook. When this step is completed, the organs of the abdominal section lie clearly in view. If the bird has been well starved, the intestines will occupy but a small space and will not hide the other organs.

The testicles, small organs, yellow in color, lie along the vertebrae or backbone, at a point slightly forward of where the incision is made. The spermatic artery lies along back of the testicles. Care must be taken to avoid severing this, as it will cause immediate death.

Gently press the intestines down with the probe, if necessary, until the testicle is brought to view. Insert the remover, closed, and carefully manipulate the organ into the opening of the remover, being careful not to pinch the artery in so doing. Twist the remover around once completely before attempting to remove the testicle. This severs the tissue connecting it to the large artery. In removing, twist a couple more times and when the testicle is drawn about an inch above the incision, cut the cord.

Remove the spreaders, turn the bird over, and repeat the operation. It is possible to remove both organs from the one side, but in practice there is less danger in performing the operation from both sides, the second incision causing less pain and often requiring less time than attempting to remove both from one side.

Birds not surviving the operation usually die on the table. These should be bled and picked immediately, as they will be good for table use. Mark all birds caponized by a leg band or toe punch to prevent slips from being confused with breeding males later on, and to prevent young capons being killed for broilers.

### Care and Feeding of Capons

**Care After Operation.** The young capons should not be housed in large numbers for the first week or 10 days. Put them in coops of not more than 10 or 12 birds together to prevent crowding. Care must be exercised in starting to feed, as the birds have been on a starvation diet and are very hungry. They should have a light feed of moist mash, consisting of bran and ground oats moistened with sour milk or buttermilk. This feed can be given immediately following the operation. This system of feeding should be adopted for a couple days, gradually bringing the birds back to their regular feed. Provide plenty of water immediately following the operation.

**Wind Puffs.** A condition known as wind puffs is likely to develop a few days after the operation. This is nothing serious and results from air accumulating under the skin. If the puff does not disappear in a week to 10 days it can be remedied by puncturing the skin with a pair of shears, or a clean small knife blade after the incision between the rib heals.

Capons require an abundant range in order to grow and develop a large frame capable of carrying a heavy fleshing. If possible, put them out in a colony house on free range and feed the same as the growing flock.

The capon season is from Christmas to Easter. Previous to killing, con-

fine the birds to crates and finish with a soft feed. This softens the fleshing and adds fat. Capons make excellent roasters, having a finer flavor and being more tender than cockerels. A good crate fattening ration can be made up of equal parts or 40-60 proportion of flour middlings and finely ground yellow corn. This is mixed to the consistency of a pancake batter by adding milk and fed twice a day. Small quantities must be fed at first in order to accustom the birds to the ration. It can be gradually increased until at the end of the fattening period, which ranges from 14 to 21 days, the birds are being fed all they will consume at each feeding.

**Dressing.** Capons should be dry picked or semi-scalded and picked clean.

## Marketing

The marketing of poultry and eggs in South Dakota is probably the biggest problem with which poultry raisers in this state are faced. During the past several years, poultry-raising has become highly specialized with large quantities of high quality eggs being produced in California, Washington, and Oregon, and shipped to Eastern markets demanding premium prices. The New England states as well as Maryland, Delaware and other Atlantic seaboard states are producing large quantities of broilers and market poultry as well as expanding their egg production and are marketing quality eggs in large quantities.

The problem of marketing in the middle west is to produce a quality product and preserve this quality through the marketing channels so that there will be a demand for our products.

### Marketing Eggs

There is no process, or step, in marketing which can improve the quality of the egg after it is produced by the hen. It is, therefore, necessary for the poultryman to appreciate the importance of factors affecting the market value of eggs.

1. Clean eggs must be produced on the farm and cooled to 50 degrees.
2. Quality eggs must be marketed at least twice a week.
3. Provide one nest for every seven hens.
4. Clean dry, litter must be kept in the laying house.
5. Provide wire netting under the roosts.
6. Produce infertile eggs when eggs are not saved for hatching.
7. Break up broody hens.
8. Gather eggs at least twice a day.
9. Standard bred chickens improve egg size of quality.

### How to Grade Eggs

The common practice in South Dakota is for producers to take their eggs to local merchants or egg and poultry buying stations, and sell them at a straight price per dozen. Small eggs and poor quality eggs bring the same price as large fresh eggs. This method of buying penalizes the good product and offers no inducement for farmers to produce better eggs. The purchaser has to buy these eggs at a low enough price so that he can

sort out the cracked, dirty and rotten eggs and still make a profit. The producer is the one who pays for this loss.

The factors that determine egg quality and grades on the market are as follows: size or weight, shell condition, size of air cell, condition of white, and condition of yolk.

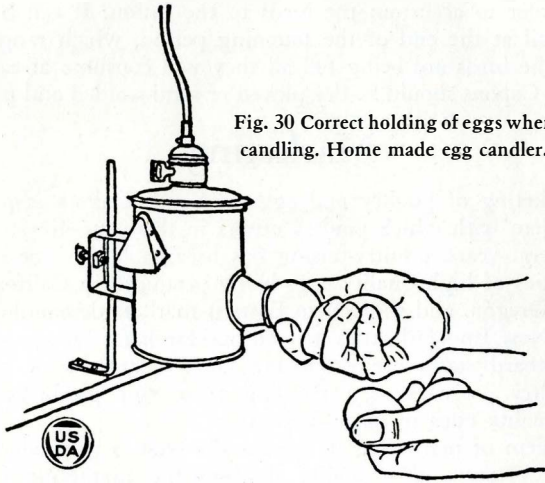


Fig. 30 Correct holding of eggs when candling. Home made egg candler.

1. Eggs must be clean and sound in shell; cracked eggs and dirties are graded separately.
2. The air cell must be small and regular  $\frac{1}{8}$  inch in depth for U.S. Grade AA,  $\frac{1}{4}$  inch in depth for A,  $\frac{3}{8}$  inch in depth for B Grade and over  $\frac{3}{8}$  inch for C grade.
3. Yolk must be centered and dimly visible. Eggs with yolks well defined, mobile and showing germ development or heat spots, are placed in lower grades.
4. White must be firm and clear. Egg whites become watery with age.
5. Size—Eggs are usually graded into three groups. Large eggs—24 oz. per dozen, medium—21 oz. per dozen, and small eggs 18 oz. per dozen.

### Market Classes of Poultry

The following market classes are in common use:

**Broilers.** Young chickens approximately eight to twelve weeks old of either sex, of marketable age, but not weighing over  $2\frac{1}{2}$  pounds each or 30 pounds to the dozen. The light weights are sometimes quoted as squab broilers.

**Fryers.** Fryers are young chickens, approximately 14 to 20 weeks old, of either sex, weighing over  $2\frac{1}{2}$  pounds and under,  $3\frac{1}{2}$  pounds each.

**Roasters.** Young chickens approximately five to nine months old of either sex, weighing over  $3\frac{1}{2}$  pounds.

**Springs.** Term commonly used to designate all young chickens hatched during the preceding spring and early summer.



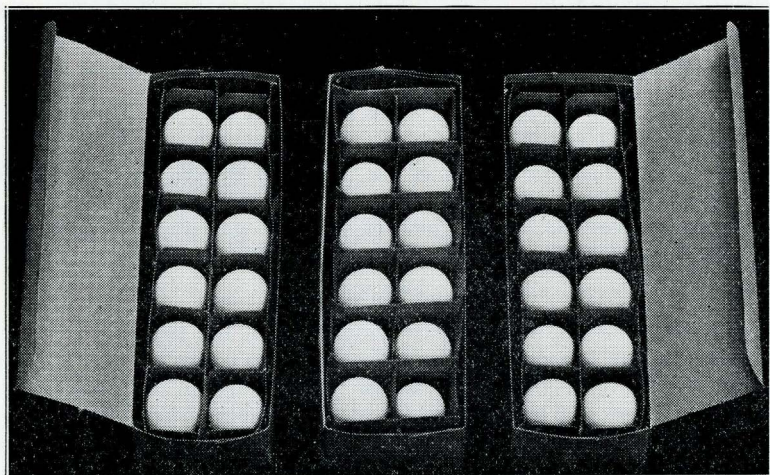


Fig. 31. Market eggs neatly packed.

**Stags.** Young male birds, of any weight, with flesh slightly darkened and toughened and with comb and spur development showing the bird to be reaching maturity.

**Capons.** Unsexed males weighing over four pounds usually from seven to ten months old. They should weigh over  $7\frac{1}{2}$  pounds before marketed to bring the highest price. Slips are birds which have been caponized, but not successfully.

**Fowls.** Mature female birds of any age or weight. They are usually divided into several classes according to weight.

### Marketing Poultry

Most poultry is sold alive to local dealers or shipped in crates to commission houses. A very small percentage is killed and dressed by producers. This is because the average farmer is not an expert in dressing poultry and does not have proper facilities. The practice of dressing turkeys, however, is common. They seem to lend themselves to this practice better than chickens and the increase in price of dressed over live turkeys has been an incentive to learn how to dress them.

The greater percentage of poultry is sold direct to the local dealer. The farmer finds this an easy method to dispose of his product. He can take a crate on the side of his car when going to town and thus save a special trip. The local dealer will accept any number. He in turn usually has connections with a larger produce house. These big houses send their trucks daily or twice a week over the territory and gather the supplies from their dealers.

Some producers consign shipments of live poultry direct to a commission house. This practice was quite popular a few years ago. The extra

express charge, and the crates needed have made this method expensive, as compared to selling direct to a local dealer, and so very little poultry is marketed this way at the present time.

### **Finishing or Fattening Poultry**

The purpose of fattening poultry for the market is to obtain a gain in weight and improve the quality of the flesh and thereby secure a higher price. Farmers fatten or finish poultry to a less extent than they do any other class of livestock. Young chickens are more growthy and make better gains during the fattening period than do old hens or cocks.

#### **Range Fattening**

When the producer undertakes to fatten his poultry, the most common method employed is range fattening. This method consists of feeding more heavily or feeding a greater proportion of fattening grain, usually corn, for a period of one to three weeks before the birds are marketed. No other change is made in the care of the birds, and they are allowed to range about the farm as usual. Such a method of feeding will result in a gain in weight, especially if the birds have previously been rather scantily fed and compelled to rustle for most of their food.

With certain classes of poultry, especially the range-raised turkey and the guinea, this is the most practicable method of fattening, for these fowl are semi-wild by nature and when shut up in a pen for fattening they are likely to go off feed after a few days and to lose flesh rather than gain.

#### **Pen Fattening**

Producers who make an effort to supply high-class poultry for a retail trade often fatten their poultry in pens. In pen fattening, chickens are confined to a pen, with or without a small yard in which to range, and are fed heavily on a fattening ration for a period of two to three weeks. When fattening in small numbers, they are usually confined to small pens in a poultry house and are not allowed access to a yard.

#### **Crate Fattening**

In crate fattening, 6 to 10 birds are confined in a small crate or coop and fed for a period of 10 to 14 days. The object is to keep the fowls quiet, so they will use their feed to put on flesh. Crate fattening is not extensively practised by producers in this country, although some use this method to produce especially fine-table poultry.

In crate fattening, the birds are fed a ration composed of buttermilk and ground grain mixed to consistency that can be poured from a pail into troughs fastened to the front of the coops or crates. Although 8 to 10 days is about the usual length of time for feeding chickens, they may continue to make gains for a longer period, and their market quality will be further improved. Young chickens of broiler size, or larger, are most commonly crate-fattened. Hens are sometimes fed by this method to improve their quality.

The question may arise with producers as to whether it would pay

them to crate-fatten their poultry before shipping it alive to market. As a general rule this does not pay unless the birds are in poor condition. It is more practicable to kill and dress fattened poultry before marketing it and thus save the shrinkage, which is especially heavy on shipments of live poultry that has been fattened.

### Killing and Dressing Poultry for Market

It is important that poultry to be dressed for market have empty crops when killed. This not only improves the appearance but the keeping quality also. No solid food should be fed for 24 hours before slaughtering but plenty of water should be given during the period to help empty the intestines. Poultry that has been dry-picked brings a premium on most markets, the reason for this being that dry-picked poultry has a nicer appearance and keeps better in cold storage.

The dry picking method is used by many poultry raisers and the club member should learn how to do it. The bird is hung head down by looping a cord around both legs or by using a wire shackle which holds the legs apart. The feet of the bird should be about on a level with the eye of the operator. The head is grasped in the left hand, the mouth opened and the jugular vein in the throat just below the base of the skull is cut with one slash of a sharp, narrow, stiff bladed knife. By exercising care in making the cut, free bleeding is induced and a well bled carcass is obtained. Poorly bled poultry shows dark blood filled veins in the neck and on the

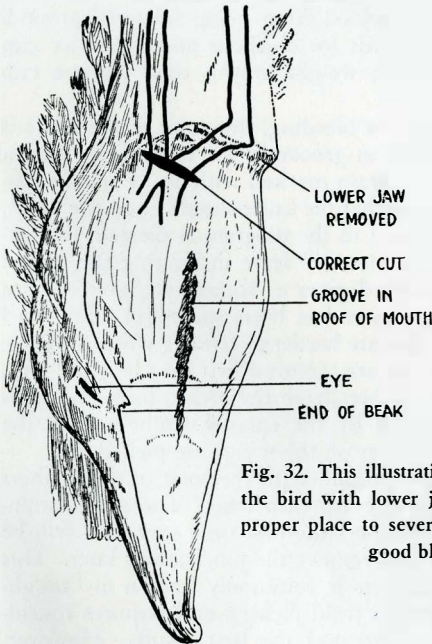


Fig. 32. This illustration shows the head of the bird with lower jaw removed, also the proper place to sever the jugular vein for good bleeding.



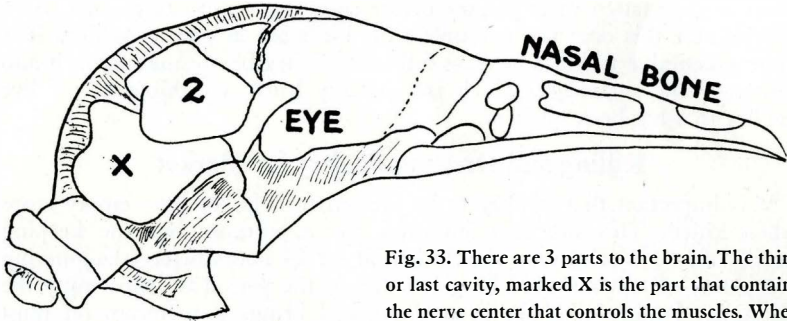


Fig. 33. There are 3 parts to the brain. The third or last cavity, marked X is the part that contains the nerve center that controls the muscles. When

this nerve center is destroyed, death occurs instantly and the feathers are loosened. Too many make the mistake of sticking the knife too high in the head and not back low enough to pierce the proper section.

breast and wings or reddened areas of the skin which not only gives a less pleasing appearance, but causes it to spoil more quickly. The illustration in Figure 32 shows the correct location for making the cut across the jugular veins. This cut is made from the left to the right side of the neck of the bird when the bird is hung with the back away from the operator. The next step consists of hanging a weighted cup called a blood cup in the angle of the lower part of the beak of the bird by means of a hook. This cup catches the blood and its weight serves to hold the bird more quietly in position and to prevent the blood from being scattered around. The cup should weigh about two pounds for chickens and a heavier cup used for dressing turkeys. Sometimes a weight only is used when a cup is not available.

As soon as the cup has been made for bleeding, the point of the knife is immediately plunged through the median groove in the roof of the mouth and into the brain. The portion of the brain marked with an "x" in the diagram, Figure 33 shows the correct point that the knife should enter the brain. If the portion of the brain marked No. 2 in the diagram is pierced, the feathers will not be loosened. A little practice will serve in locating the correct spot. When the brain is pierced, the bird gives a "squak" or "gulp" and a "quiver" which means that the operation has been successful. The bird should be picked quickly as the feathers are harder to remove when the muscles begin to set. The large tail feathers are removed first by a twisting jerk. Then the large wing feathers. The feathers from the breast, back and sides are removed next. These are followed by the smaller feathers from the thighs, legs, and neck. The small feathers on the wings are picked last.

In dry picking, care must be taken to pull with the slant of the feathers rather than against them which will prevent skin tears. Too much attention should not be given to the pin feathers the first time over as it will be necessary to go over the entire body and remove the pin feathers later. This rapid removal of the bulk of the feathers is commonly known as "roughing." Dry picking is more difficult than scald picking and requires considerable skill and practice to secure speed and the best results. However,

where a considerable number of birds are to be dressed, it will pay to use this method.

A modified method of scald picking known as the "slack-scald" or "semi-scald" method is being used by most produce houses. In this method the birds are stuck and bled, the large tail and wing feathers removed, and they are then plunged in water which is maintained at a temperature of 130 degrees. They are kept in this water from  $\frac{1}{2}$  of a minute to one minute depending upon the class of poultry. The feathers are then picked off instead of being rubbed off as is done with scalded poultry. This method of picking produces a nice appearing carcass, but requires too much equipment for the average producer.

All birds must be thoroughly cooled but not frozen before packing. They should not be cooled in water. They should be hung on a rack so that one carcass does not touch another and at a temperature of 34 degrees to 35 degrees until the animal heat is entirely removed. If dressed birds are subjected to a freezing temperature

before the animal heat is removed, the outer surface will freeze and not allow the animal heat to escape which will cause spoiling. Birds treated in this manner arrive on the market showing green areas and oftentimes in a slimy condition. Birds in this condition are known as "green-struck," are inedible, and must be condemned.

Remove the blood clot from the throat and mouth with the finger or a large stiff feather. If the clot is not removed, it will spoil the appearance of other carcasses in the same pack and may decompose and injure the flavor of the flesh. Small paper bags secured with string or rubber bands make a quick, practical head wrap for birds that are to be shipped. Do not wrap the head until cool and the blood has stopped dripping.

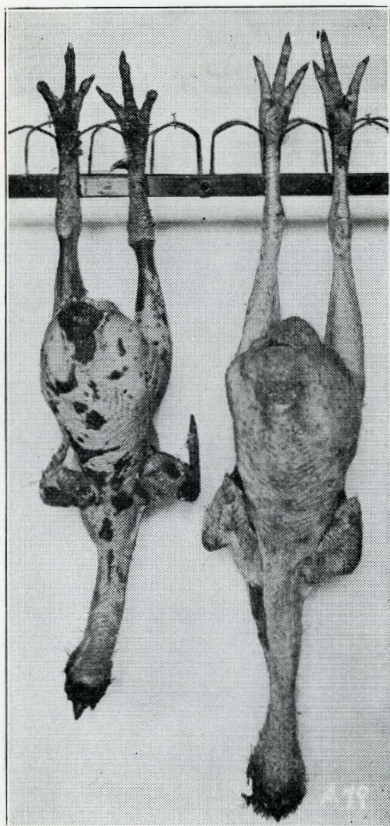


Fig. 34. Partial cooking and breaking of the skin common to scald-picked poultry (left) gives it a less attractive appearance and a lower keeping quality than dry-picked poultry (right).

### Packing

Use a barrel or box to pack birds for shipment. First, line the container with clean wrapping paper. The feet should be brushed or cleaned with a damp cloth. Pack closely to keep the birds from shifting about or they will become bruised. Do not attempt to dress poultry for shipment in warm weather unless you can pack in ice. The producer should ship only in cold weather unless the distance is short.

Important points to remember in dressing and marketing poultry are as follows:

1. Poultry should be fattened or at least in good condition.
2. Starve fully 24 hours before killing.
3. Give poultry plenty of fresh water before killing.
4. Bleed thoroughly.
5. Pick clean.
6. Remove blood clot
7. Wrap head.
8. Pack tightly.
9. Ship only in cool weather unless ice is used.
10. Raise standard bred poultry.

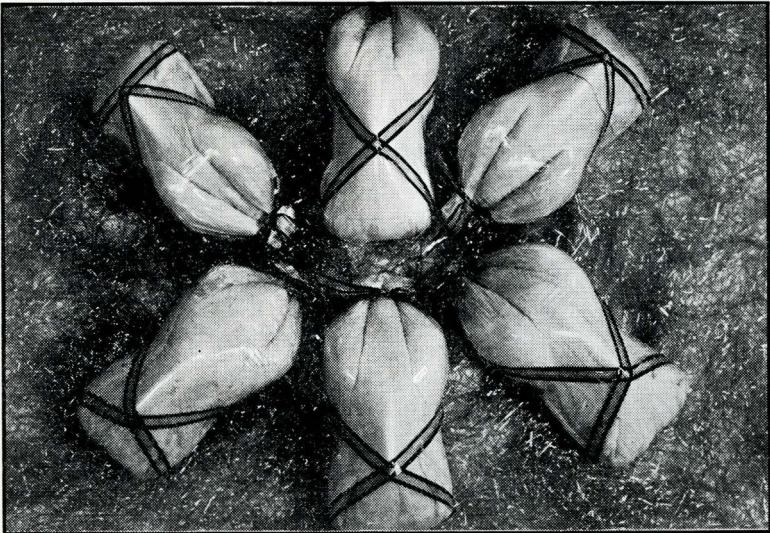


Fig. 35. Full drawn dressed poultry wrapped in cellophane makes an attractive package. Attractive packaging is important in marketing poultry.



## Information for Poultry Club Members

### Books On Poultry Subjects

- Farm Poultry Production by Card and Henderson—Interstate Printing Company, Danville, Illinois.
- American Standard of Perfection—American Poultry Association, Davenport, Iowa.
- Poultry Production by Lippencott and Card—Lea and Febiger—Philadelphia, Pennsylvania.
- Poultry Husbandry by M. A. Jull—McGraw-Hill Book Company Inc., New York, New York.
- Diseases and Parasites of Poultry by Barger and Card—Lea and Febiger—Philadelphia, Pennsylvania.
- Marketing Poultry Products by Benjamin and Pierce—John Wiley and Sons Inc., New York, New York.
- International Poultry Guide—International Baby Chick Association, Kansas City, Missouri.

### Farmers' Bulletins—U. S. Department of Agriculture

May be obtained by writing the Division of Publications, United States Department of Agriculture, Washington, D. C.

- |      |                                                |      |                                           |
|------|------------------------------------------------|------|-------------------------------------------|
| 849  | Capons and Caponizing                          | 1507 | Standard Breeds and Varieties of Chickens |
| 1115 | Selection and Preparation of Fowls for Exhibit | 1841 | The Feeding of Chickens                   |
| 1377 | Marketing Poultry                              | 1554 | Poultry Houses and Fixtures               |
| 1378 | Marketing Eggs                                 | 1652 | Diseases and Parasites of Poultry         |
| 1524 | Farm Poultry Raising                           |      |                                           |

### South Dakota Extension Service Circulars

May be obtained free by writing the Extension Service of South Dakota State College, Brookings, South Dakota

- |     |                              |     |                                 |
|-----|------------------------------|-----|---------------------------------|
| 148 | Chick Feeding and Management | 362 | Poultry Houses for South Dakota |
| 159 | Judging for Egg Production   |     | Timely Poultry Hints            |

### Poultry Publications

*American Poultry Journal*, 536 S. Clark Street, Chicago, Illinois.

*Everybody's Poultry Magazine*, Hanover, Pennsylvania.

*Poultry Item*, Sellersville, Pennsylvania.

*Poultry Tribune*, Mount Morris, Illinois.

### EXTENSION SERVICE—SOUTH DAKOTA STATE COLLEGE BROOKINGS, SOUTH DAKOTA

Published and distributed under Acts of Congress, May 8 and June 30, 1914, by the Agricultural Extension Service of the South Dakota State College of Agriculture and Mechanic Arts, Brookings, A. M. EBERLE, *Director*, U. S. Department of Agriculture cooperating.