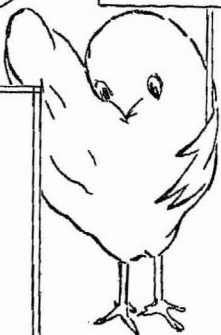


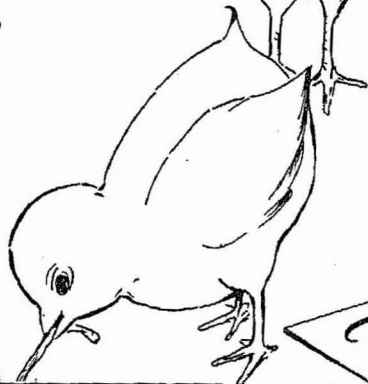
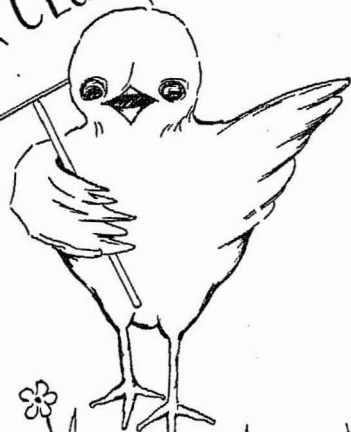
TURKEY CLUB

# 4-H POULTRY MANUAL



PULLET CLUB

CHICK CLUB



CAPON CLUB

Montana Extension Service.  
BOZEMAN.



## FOREWORD

Since many subjects which are discussed in various units and years of 4-H Poultry Club work overlap, the 4-H Club and Poultry Extension Departments feel it will be more economical to prepare one 4-H Poultry Club Manual. The Manual is therefore prepared to take care of all four years of 4-H Poultry Club work. Because this is true, the member is cautioned to take care of this copy. A second copy will not be issued.

Besides giving subject matter concerning every phase of poultry husbandry, the manual also contains suggestions for tours, contests, demonstrations and exhibits.

The author has expended a great deal of time and effort in compiling so extensive a manual, therefore it is hoped that 4-H members will appreciate this fact by taking care of the manual.

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Montana Extension Service in Agriculture and Home Economics, J. C. Taylor, director.  
Montana State College and United States Department of Agriculture Cooperating.  
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## 4-H CLUB POULTRY PROGRAM

## GENERAL MINIMUM REQUIREMENTS

(For detail of requirements see folder devoted to the particular year of 4-H Club work in question.)

**First Year.**(Choice of three units):

- Unit A — Pullet Club — Grow 50 pullets from 8 weeks or when they can do without heat to maturity.
- or Unit B — First Year Capon Club—Grow 50 capons from the time of operation to marketing time.
- or Unit C — First Year Poultry Practices Club — (For members owning no poultry)—Complete all requirements outlined in the First Year of this unit.

**Second Year** (Three units):

- Unit A — Chick - Pullet Club — Grow 100 baby chicks, market cockerels and rear pullets to maturity.
- or Unit B — Second Year Capon Club — Grow 100 baby chicks, market or rear pullets, caponize cockerels and grow capons to marketing time.
- or Unit C — Second Year Poultry Practices Club—(For members owning no poultry) — Complete all requirements included in Second Year Poultry Practices Club.

**Third Year** (Three units):

- Unit A — Chick-Pullet Club—Grow 200 baby chicks, sell cockerels, rear pullets and cull the pullets for the laying hen phase of the work. Prepare laying quarters for the hen phase and house pullets by October 1.
- or Unit B — Third Year Capon Club — Grow 200 baby chicks, sell or rear pullets, caponize and market capons.
- or Unit C — Third Year Poultry Practices Club — (For members owning no poultry). — Complete all requirements included in Third Year Poultry Practices Club.

**Fourth Year** (Three units):

- Unit A — Flock Management Club—Carry the pullets through the 12 months laying period (which were housed at the end of the Third Club Year). During the spring rear enough chicks and pullets which when combined with the hens from the fourth year laying

flock will give a flock of 400 laying hens to go into the laying house by October 1st.

- or Unit B — Fourth Year Capon Club — Repeat third year work, expanding as much as rearing facilities will permit.
- or Unit C — Fourth Year Poultry Practices Club — (For members owning no poultry.) Complete all requirements included in Fourth Year Poultry Practices Club. In addition carry the adult Poultry Demonstration Farm Project for 12 months. If the member does not live on a ranch or where a poultry flock is kept, these records may be kept on a nearby flock.

#### Fifth Year:

- Unit A — Second Year Flock Management—The member shall carry a laying flock of at least 400 hens for 12 consecutive months, keeping the Demonstration Farm Records on the flock. During the spring the member shall raise enough chicks to make replacements for a 400-hen flock or enough chicks to supply about 300 well matured culled pullets. This will be about 900 to 1000 chicks.
- or Unit C — Fifth Year Poultry Practices Work — (For members owning no poultry.) This year is a repetition and expansion of fourth year work. The member will be expected to take on a regular job as state egg grader, U. S. turkey grader or authorized inspecting agent hired by a hatchery or the Montana Poultry Improvement Board.

**Note:** Any club member who elects Poultry Club work will have completed his or her year's work when all of the requirements of any one unit of the work for any given year have been completed. For example, a member may take Unit A without taking Units B or C. Furthermore, a member may elect and complete four years of the poultry program in any single unit. That is, the member may take four years in Unit A, four years in B or four years in Unit C. However, if the member wishes to change from one unit to another, certain rules must be observed. (1) No member starting the poultry program may start with Second Year work in Units A or B before the First Year work has been successfully completed. (2) Even though a member may have completed four years of Unit C, he must take the First Year work of Units A or B before more advanced work can be taken. In other words, no member may undertake the job of handling day old chicks until he has proven that he can handle growing stock. Then growing stock management and chick rearing must be mastered before the member is ready to handle adult birds in the laying house.

## CLUB AND COMMUNITY ACTIVITIES IN ALL UNITS

While club and community activities are not requirements, a member scores higher and not only has made a greater contribution to the community, he also enriches his life in entering wholeheartedly into this phase of club work. These activities are:

Participation in the Health Program,

Attendance of all club meetings which are regularly scheduled,

Participation in judging work,

Developing demonstration skills. A member should put on at least one demonstration before the club at a regular meeting.

Exhibiting at fairs when possible.

### Chapter I

## GROWING YOUNG STOCK

Probably no phase of a bird's life is more frequently neglected than the period from the time the bird leaves the brooder house until it reaches maturity. Yet this is an extremely important period. If stunted during the growing period, the bird never amounts to much. This is equally true for pullets, cockerels, capons and turkeys. Therefore when a 4-H member learns to handle growing stock, the first important step in poultry husbandry is mastered.

To take this step the member must have adequate buildings, equipment, proper range, a balanced ration and above all, good chicks.

### The Range, Shelters And Equipment

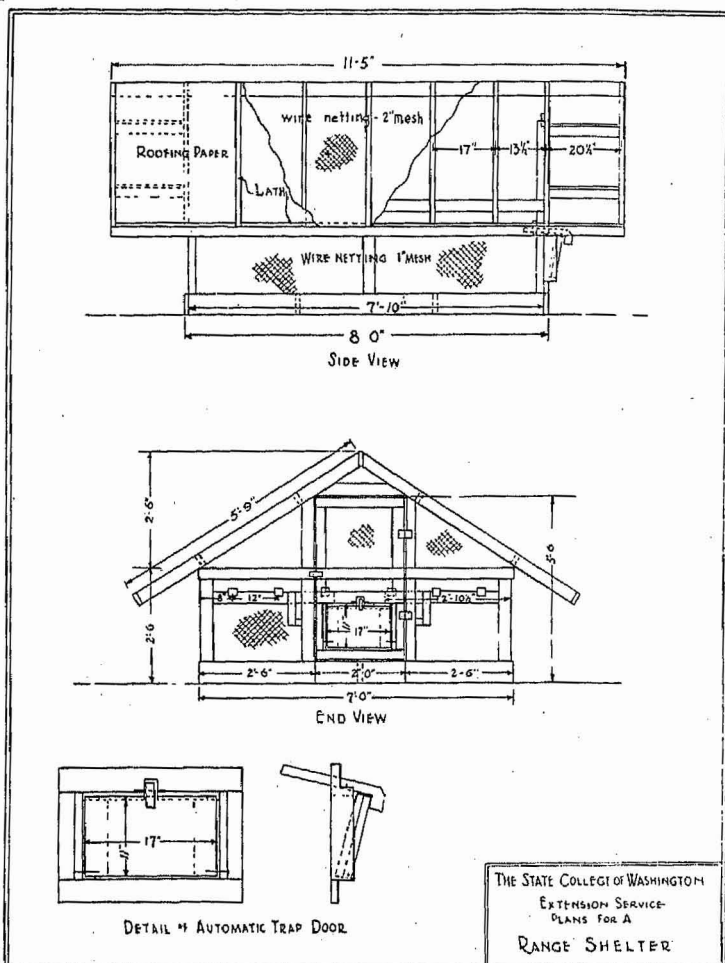
**The Range** — A clean range should be provided — one where no birds have run for at least a year, preferably two or three years. This is so necessary that when a member can not provide clean range, enrollment in another 4-H project is advised. One acre will support 300 growing chickens or 150 turkeys. However it is better to plan on one acre for each 100 birds, since birds must be moved at least three times during the growing season.

If an alfalfa or green sod range can be used, the growing cost may be cut about 20%. Also birds reared on a green range are healthier and grow more rapidly. When running water (either piped or in a stream) is available the labor of handling birds is reduced and the birds grow faster.

**The Range Shelter** — When birds are fully feathered over their backs, it is time to move them to the range. If they can be roosted in a range shelter, they grow better than in a brooder

house. Besides, a range shelter is easier to ventilate and costs less to maintain.

A shelter need not be fancy or expensive. It is merely roosts with a roof, wire sides and wire floor. The roosts should be about 12 inches apart. The comb of the roof is about five feet from the ground and the eaves about  $2\frac{1}{2}$  feet from the ground. The size of the shelter depends upon the size of the flock. Pullets and capons will need 8 to 10 inches linear roost room. Turkeys will need 9 to 12 inches. Thus a 7 ft. x 8 ft. shelter will accommodate 100 pullets or 50 turkeys.



Use	Bill of Materials		Length
	No. Pieces	Size	
Sills	2	1 x 6	7' 10"
Sills	2	1 x 6	7' 0"
Floor braces	1	1 x 6	7' 10"
Floor braces	2	1 x 6	6' 10"
Studs	6	2 x 3	2' 6"
Studs	4	2 x 3	4' 3"
Girts	2	1 x 3	7' 10"
Girts	1	1 x 3	7' 0"
Girts	2	1 x 3	2' 6"
Rafters	18	1 x 3	5' 9"
Ridgeboard	1	1 x 4	11' 5"
Eavesboards	2	1 x 3	11' 5"
Brace over door	1	1 x 3	2' 0"
Roosts	6	2 x 2	7' 10"
Roost supports	4	1 x 3	2' 10½"
Door	2	1 x 3	3' 6"
Door	4	1 x 3	2' 0"
Laths	24		
Roofing	1½ rolls 36" 2-ply roofing paper.		
Hardware			

Wire for sides 36' of 1" mesh; 2' wide poultry netting

Wire for floor 16' of 1½" mesh 4' wide poultry netting, No. 18 gauge

Wire for roof, 23' of 2" mesh 6' wide poultry netting

Nails - 2 lbs. 8d

Nails - 1 lb. 6d

Staples 1 lb.

Hinges 1 pr. 2"

**Range Shade**—If birds have shade, they grow faster, feather better and do not sunburn. However birds should not hang around a shelter belt or patches of underbrush where birds have run year after year. Sooner or later sickness occurs unless the ground is cleaned up. If no natural shade is available the member may make a shade or plant corn or sunflowers in rows to provide shade.

**Range Equipment**—Range feeders and waterers should be (1) movable; (2) covered to provide shade and protection from weather;

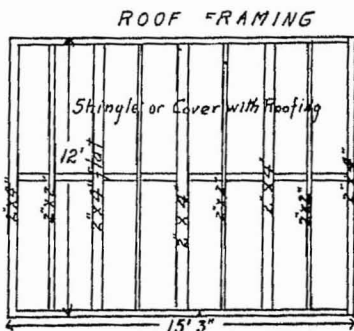
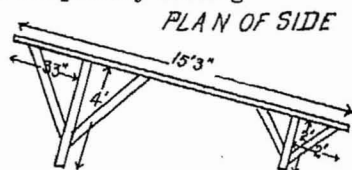


Figure 2. Range Shade.

(3) large enough to hold a day's supply of feed or water and (4) placed on platforms to avoid wet or dirty spots around the equipment. A club member should be able to make this equipment.

### FEEDING GROWING STOCK

**Feeding Systems**—Growing birds do not need as rich a diet as they did when younger. However they need a ration which will supply body building and energy materials. In addition they must have plenty of clean, cool water. To provide feed requirements any one of several systems may be used:



Figure 3. Range Waterer.

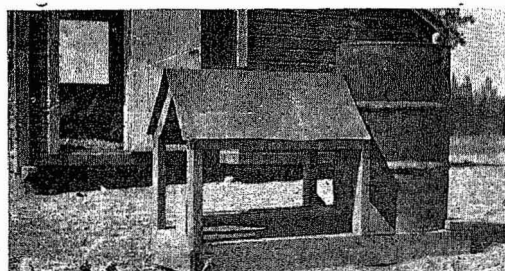


Figure 4. Range Waterer

1. Commercial or home mixed growing mash before them in hoppers at all times plus morning and evening whole grain feedings:

- a. Give the amount of grain that will be cleaned up in an hour.

- b. If fed on the ground, choose a clean spot each time.

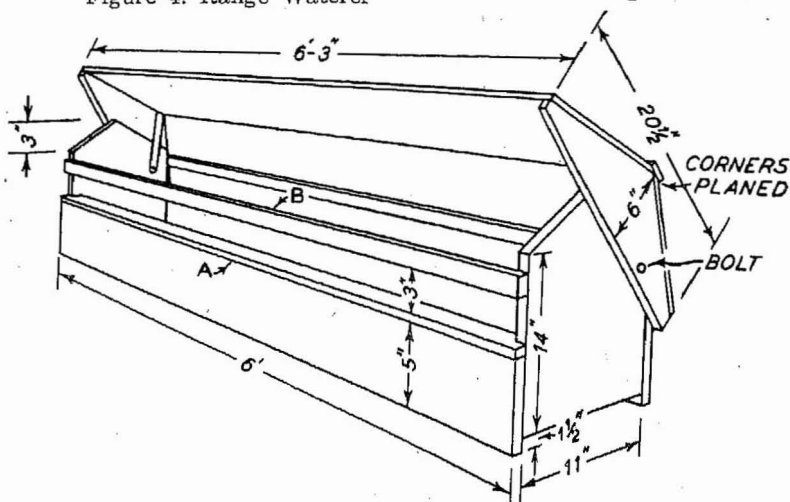


Figure 5. Range Feeder



2. Growing mash (commercial or home mixed) plus whole grains fed in separate hoppers. Both feeds remain before the birds at all times. This is called "cafeteria style."
3. Milk plus whole grains plus green feed. To meet the bird's needs, 3 gallons of skim milk or buttermilk must be consumed daily per 100 birds. The grain is kept before them at all times in hoppers. With this system it is very necessary that the range be green. If not, additional greens must be fed daily.

**Growing Mash Formulas**—There are many good formulas for mixing growing mashes. The following have proven satisfactory:

#### Growing Mash

	Ground wheat .....	30 pounds
	Ground oats .....	20 pounds
	Ground corn (yellow) .....	15 pounds
	Ground barley .....	10 pounds
(1)	Meat scrap (50% protein) .....	10 pounds
	Dry Skimmed milk .....	5 pounds
	Alfalfa leaf meal .....	5 pounds
	Bone meal .....	2 pounds
	Oyster shell (ground) .....	2 pounds
	Salt .....	1 pound
(2)	Cod liver oil .....	1 pint
	Manganese Sulphate .....	4/10 ounce

**Note 1:**

Total 100 pounds

When meat scrap and dry skim milk cannot be purchased and liquid skim or buttermilk is not available, substitute 2 pounds of dried whey plus 5 pounds of cottonseed meal and 8 pounds of soy bean meal.

**Note 2:**

When a guaranteed cod liver or other fish oil of known Vitamin D content is not available, substitute 2.4 ounces of Vitamin D supplement having 400 A.O.A.C. chick units.

**Proportions of Feed-Stuffs**—It is just as important to have birds eat the right proportions of their feeds as it is to have these feeds balanced. For example, if the birds fill up on grain and eat no growing mash, they get fat and grow slowly. On the other hand, let a pullet eat only mash, she will comb up and lay before she gains body maturity. Table 1. gives an idea of the proportions of mash and grain which birds should eat at various ages.

Table 1—Proportions of Mash to Grain Consumption

Age in Weeks	% Grain	% Mash
6	5	95
8	10	90
10	20	80
12	30	70
14	40	60
16	50	50
18	60	40
20	70	30
22 to maturity	75	25

**Growth to Feed Consumption**—Another important feeding factor is the relation of rate of growth to amount of feed eaten. To get this, the average weight of the flock must be recorded as well as a record of feeds eaten. A member is not expected to weigh each bird weekly to ascertain rate of gain. To do this would be foolish and time consuming. But a sample of birds should be weighed each week. At the beginning of the growing season five average birds should be marked in some way so that they can be easily spotted. Don't pick five extra large birds or runts. Some poultrymen mark birds by daubing paint across their shoulders. This method requires repainting whenever birds grow new feathers. If leg banded, watch the legs. A growing chick may soon outgrow its band. This will cause sore legs, even crippled birds. The same five birds are put in a crate and weighed each week. Their total weight is divided by 5, giving a fairly accurate average weight for the entire flock. Catching at night while roosting is a simple way to handle the problem.

Table 2. Growth and Feed Consumption for Rhode Island Reds,  
1 — 24 weeks.

Age in Weeks	Average Weight per Chick in Pounds	Average Pounds Mash and Grain Eaten	Age in Weeks	Average Weight per Chick in Pounds	Average Pounds Mash and Grain Eaten
1.	.11	.08	13	2.39	1.17
2	.17	.18	14	2.47	1.14
3	.26	.24	15	2.77	1.23
4	.36	.28	16	2.91	1.39
5	.52	.45	17	3.14	1.54
6	.71	.60	18	3.27	1.60
7	.95	.69	19	3.44	1.52
8	1.22	.85	20	3.68	1.67
9	1.47	.95	21	3.85	1.71
10	1.74	1.03	22	4.04	1.72
11	1.97	1.07	23	4.17	1.68
12	2.25	1.14	24	4.30	1.76

Data from Storrs, Conn.; Coastal Plains Experiment Plant, N. C., and Purdue Univ.

Though these experiments are not new, the figures will serve as a guide. In Montana with its long growing days, birds usually eat more and make faster gains.

### YOUNG STOCK DISEASES

Since a special chapter is devoted to diseases, only mention of the troubles affecting growing stock will be given here. Growing chicks are apt to have coccidiosis, colds, fowl paralysis, perosis, vitamin deficiencies and troubles caused by an infestation of worms, mites or other parasites. Also growing turkeys are subject to blackhead.

As with all diseases, a member should spot a sick bird at once, take it away from the flock and correct the cause of the disease.

### RANGE MANAGEMENT

There is more to handling growing stock than giving them shelter and feed. A good poultryman watches his birds all the time. He heads off dangers and anticipates the birds' needs.

**First Nights in a Range Shelter**—If birds have come from a warm brooder house, they should be shielded from drafts and cold winds. They must be kept from crowding and taught to use their new roosts.

**Storms**—Until birds learn to run to shelter, the member should see that the birds are driven in before a storm. Be sure the door has not blown shut. Keeping birds out in a storm may cause heavy losses.

After a storm, the range should be checked. Fill up or drain puddles. Stagnant water causes sickness.

At all times watch for any dead chicks or gophers on the range. Nothing sickens birds quicker than eating decaying flesh.

**Enemies on Range**—One or two species of hawks sometimes prey upon poultry on the range. Several poles may be set up with strings or wire stretched between the poles. Bits of shiny metal are strung on the strings, for example, old lids from fruit jars. The metal catching the sunlight scares the hawks away. At night birds should be securely locked into the range shelter. If small animals like minks or weasels bother, a tight, inch-mesh wire under the roosts keeps them out. When young turkeys are roosting on exposed perches, it is well to keep a lighted lantern on a pole near the roosts. If coyotes are a menace, it is well to keep birds closed in their shelters until after daylight. A tight fence about open roosts helps. With a large flock of birds roosting in the open, the member may find it necessary to sleep in a tent near them.

**Dried Out or Dirty Range**—The member is advised to change range at least 3 times during the growing season. Yet no management detail requires the member's judgment and common sense as much as the decision of when to move birds. If the birds eat the green feed down to the roots, a vitamin A deficiency is liable to show up. Then look out for colds, swollen eyes and slow growth. During a dry season when the range dries up, birds must be moved oftener than when the range stays green.

**Hot Nights**—Montana has few hot nights. But one hot night may ruin the flock. If hot nights occur, see that ventilation is adjusted to meet the condition.

**Feeding**—The real test of a poultryman is how he manages the feeding problem. What kind of feed is needed, the proportions, and the amounts have already been discussed. Yet under Range Management something more should be said. The good poultryman watches the feeders. Are birds wasting feed? Are birds choosy, selecting some ingredients and leaving others? Did last night's rain wet the feed, causing the mash to sour? Does the wind sometimes blow the mash away? Do the birds go on the roosts at night with full crops? A good poultryman checks all of these things each day so that faults may be corrected at once.

**Uneven Development**—Even though a balanced ration is given and plenty of feeder space provided, all birds do not develop uniformly. If a member has a small number of birds, little can be done about this. But with a greater number, the birds may be divided into early maturing, medium and slow maturing birds. Dividing sizes, gives a more uniform bunch of birds at the end of the project. The birds which grow too fast are given more grain and less mash than suggested in table 1; the slow birds are given more mash and less grain than called for in the schedule. The medium birds follow the schedule.

### CLUB ACTIVITIES

The preceding part of the chapter has dealt with subject matter. This section deals with suggestions not included in the 4-H Guide which may help to make the club program more interesting and worth while.

**Tour**—Sometime during the summer, the club usually plans a tour. This may include visits to all members' homes. On such a trip members can better evaluate their progress if their projects are scored. The following has proven to be a useful score:

Factors Scored	Scale of Points	Score
1. <b>Clean Range:</b> Are birds on ground which has had no poultry on it last year?	18	
2. <b>Separate Range:</b> Is only one age and sex using the range? That is, not hens and pullets; not pullets and cockerels; not chickens and turkeys.	5	
3. <b>Adequate Range:</b> Are there no more than 300 growing birds per acre?	8	

4. <b>Green Feed:</b> Does the range supply sufficient green feed, alfalfa, sweet clover or green sod?	6	
5. <b>Sanitary Conditions:</b>		
a. If stationary, is the house cleaned weekly? (5) or If movable, is the range shelter, with wire or slat floor, moved at least every 2 or 3 weeks? (5)		
b. Are puddles on the range filled and ground around the shelter and equipment kept clean? (4)		
c. Has house been sprayed and is it free from mites? (3)	12	
6. <b>Adequate Shelter:</b>		
a. Do birds have adequate roost room? (5)		
b. Do birds have shade during the day? (5)		
c. Are birds protected from enemies (3)		
d. Is house ventilated at night? (3)	16	
7. <b>Adequate Equipment:</b>		
a. Do birds have enough feeder space? (5)		
b. Do birds have enough drinking fountain space? (5)	10	
8. <b>Proper Ration and Feed Consumption:</b>		
a. Is the ration properly balanced? (9)		
b. Are the birds eating the proper proportions of grain and mash? (8)		
c. Are the birds eating enough for their age and weight? (8)	25	
<b>Total</b>	<b>100</b>	

## DEMONSTRATIONS

A demonstration is rightly considered an important 4-H activity, since through a demonstration:

1. Members gain confidence in public speaking,
2. Members learn more about poultry practices, (They learn by doing).
3. Members show others how to do a job. (This showing others is definitely a 4-H obligation).

Thus every member should give a least one demonstration during the year. It may merely be a simple demonstration given at a regular club meeting.

In discussing the essentials of a good demonstration, the Latin derivation of the word should be kept in mind. "De" means fully and "monstro" means show. Unless "showing fully" is accomplished, the demonstration is poor. Thus an illustrated lecture is not a demonstration. Charts should be used only to outline and summarize the points made in the demonstration.

The first step in preparing a demonstration is to prepare an outline. This should contain an introduction, the main body of the demonstration and the conclusion. In the introduction the reasons for giving it are explained. The main body of the demonstration shows the doing of the practice. In the body of the demonstration, each point to be emphasized should be listed. The conclusion summarizes the steps of the work. The outline also should contain a list of all the materials needed in giving the demonstration.

In a good demonstration, the member uses methods which might be called dramatic technics:

1. The doing of the job must be coordinated with the speech. For example, in a culling demonstration, when a member says "The back should be broad," he should move his hand down the back of the bird which he is using for demonstration, to show the width. The saying and the doing should be so well timed that the audience will not be conscious of **hearing** and **seeing** as separate steps. In a play an actor may say, "I am glad." His facial expression, tone of voice and gestures all convey the same emotion at one and the same time.

2. Never distract the audience's attention from the thing being shown. If two members are putting on a demonstration, the person who is not talking should move quietly, work at the back of the stage and not attract the audience's attention.

3. Never turn one's back to the audience while demonstrating.

4. Never mumble words, mispronounce them or speak in a monotone. Speak each word distinctly with a pleasing inflection. Speak as if enjoying the work and as if it was so important that others are going to enjoy it.

5. Be sure of the subject and verify each statement made. For example, one can not give a convincing egg candling demonstration unless one actually knows how to candle eggs. In fact he must be such an expert candler that every phase of the candling will be thoroughly understood. Under these conditions, the audience has confidence in the statements made by the demonstrator.

6. "Practice makes perfect" is true in demonstration presentation. The first few times the demonstration is given, the words and actions may not be coordinated, the member may hesitate. After some practice, if not careful, the demonstration may sound stilted, as if the member was reciting a piece. Practice beyond this point, until every motion and word sound natural. One way to avoid a stilted speech, is to avoid practicing the speech without the "showing." For example, while practicing a feed mixing demonstration, never rattle off that ground wheat is to be added. Rather go through the motions of pouring 100 pounds of feed onto the mixing floor while saying, "Now I add 100 pounds of ground wheat". One does not need to use actual grain during practicing. Nevertheless when pouring the make-believe grain, remember how it would feel when lifting and pouring 100 pounds of wheat. Also how long it would take.

When a member feels that the demonstration is ready to present, he should ask himself, "Have I explained **why** each step has been taken, **how** it was done and **when** it should be done? Have I shown fully?"

**Demonstrations which may be given to explain some of the growing young stock practices are:**

**1. Making Range Shelters or Range Shades**

OR

**2. Making Feeders or Waterers.**

a. **Equipment necessary**—(1) All pieces of material which are needed in the construction of the piece of equipment or building. Have these sawed to length and ready to put together prior to the demonstration. It is wise to have the nail or screw holes made previously, to avoid distracting attention by hammering during the demonstration. (2) Hammer. (3) Tape measure or yard stick.

b. **Points to be emphasized**—(1) Explain why the piece of equipment or building is necessary in young stock production; (2) Explain the use and dimensions of each part of the equipment or building and show how it is put together; (3) Explain how many birds the piece of equipment or building will accomodate.

**3. Mixing a Growing Mash**

a. **Equipment needed**—(1) Sacks containing the ingredients to be used in the mixing of the mash. (2) A scoop shovel for hand mixing or (3) a model, home-made feed mixer. All of these pieces of equipment for this

demonstration may be made small sized and the mixing done upon a table instead of the floor.

- b. **Points to be emphasized**—(1) Why each feed stuff is used; (2) the amounts to be used; (3) show how the actual mixing is done.

#### 4. Pullet Selection or Culling

- a. **Equipment necessary**—A slow maturing bird, a low constitution bird, a vigorous bird and an early maturing bird.

- b. **Points to be stressed**—The member should follow the points brought out in table 5 on pullet selection.

#### 5. Control of Internal and External Parasites

- a. **Equipment necessary**—(1) louse powder; (2) "Black Leaf 40"; (3) a good disinfectant; (4) round worm capsule; (5) camala tablet or capsule; (6) a bird to work upon; (7) a section of roosts; (8) a brush to apply "Black Leaf 40."

- b. **Points to be stressed**—(1) explanation of why birds should be treated for parasites (2) Where to look for parasites and general symptoms of birds with each of the parasites; (3) Show how to treat the bird for each of the parasites if present.

#### 6. Washing and Preparation of Birds for Exhibition

- a. **Equipment Necessary**—(1) three tubs; (2) lukewarm water; (3) soap; (4) bluing; (5) dipper; (6) towels; silk cloth; (7) grooming oil; (8) a white bird and a colored bird.

- b. **Points to be stressed**—(1) Explain why a bird should be washed or groomed for exhibition; (2) show the actual washing of the white bird; (3) the brushing and rubbing with silk cloth of the colored bird; (4) oiling the bird's shanks.

**Exhibiting Birds**—Every 4-H Club member enrolled in poultry projects should learn to prepare birds for exhibition and show them.

- 1. **An Entry**—For most shows 1 male and 2 females of the same age birds make an entry; that is, 1 cockerel and 2 pullets or 1 cock and 2 hens. A pair of ducks or geese make an entry. Capons and turkeys are entered singly. With turkeys an entry may be: a young tom, an old tom, a young hen or an old hen of any variety.



2. **Type of bird to select** — While body conformation as described under culling (see chapter IV) is important, about 40% of the value of the bird in exhibition judging is placed on color. "The American Standard of Perfection" is the official guide. Therefore before showing a single entry or trio, the member should study the section of the Standard pertaining to his breed and variety. He should not only know the requirements of the breed, but also know the defects and disqualifications.
3. **The Trio or Pen**—In selecting a pen or trio, uniformity of the individuals is extremely important. Never select one outstanding bird and one mediocre bird. Also it must be remembered that the male is worth 50% of the pen. A disqualified bird in a pen will throw out the whole pen.
4. **Common Disqualifications**—If a bird is disqualified it will not be considered in the competition at all.
  - a. **Combs** not true to type; that is single combs on rose comb varieties and vice versa. Rose Combs without a spike at the rear of the comb. Single Combs with a **side sprig**. A side sprig is a decided pointed growth on the side of a single comb.
  - b. **Feathers** on the shanks or down between the toes of cleaned shanked varieties. These are called **stubs**. Absence of feathers on shanks of varieties requiring feathered shanks.
  - c. **Slipped wings** disqualify. Either from injury or inheritance, the muscles of the wing may be so weak that they will not hold the wing feathers neatly in place.
  - d. **Earlobes**  
Any enamel white in the ear lobes of red ear lobed birds is a disqualification. More than  $\frac{1}{3}$  red in white ear lobed birds disqualifies.
  - e. **Other disqualifications** which may occur, but not as frequently, are: split wings, squirrel tails, twisted feathers, wry tails, vulture hocks in chickens; scoop-bills in ducks and white at the base of the main tail feathers of bronze turkeys which shows above the converts.
5. **Preparing birds for show**
  - a. **Legs and feet**—All legs and feet should be washed. Their appearance is further improved if rubbed with grooming oil. An excellent grooming oil is:  
cooking oil—2 ounces  
grain alcohol—1 ounce  
acetic acid—1 dram

Shake well before using. Rub legs and feet with oil, then rub with a woolen cloth.

b. **Body feathers**—Colored birds and clean white ones look nicer when smoothed with a silk cloth. Dirty white ones should be washed.

6. **Washing birds**—In washing birds it is important to use a pure soap, such as ivory or castile and soft luke warm water. Where the water is hard, rain water should be used. The soap should be dissolved in the water. Never soap the birds. A thorough rinsing is important. Birds should be rinsed at least three times, so that the feathers will fluff up when dry. Sticky feathers result when soap is left in the feathers. A little blueing may be added to the last rinse. After washing, the surplus moisture should be absorbed in towels. Do not rub the birds as the feather barbs may be injured and the dried feather will not look smooth. Birds should be put in a clean moderately warm place while drying. They will catch cold if the room is too hot or too cold.

7. **Taking Birds to the Show**—Every member intending to show should make a roomy, durable, shipping coop. It should be large enough for the bird to be comfortable but not large enough for the bird to turn around and spoil its plumage. Fig. 6 gives the dimensions for an average coop. It should

be made long enough for turkeys to keep their tail feathers from being broken.

8. **Training for Showing** — Birds which are excessively scared do not show off to advantage. Thus birds which are to be exhibited should be handled. Further they should be placed daily in a coop about the size of a show coop so that they will not be nervous and flighty when taken to the show.

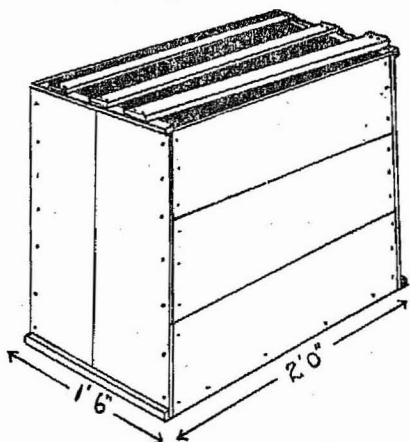


Figure 6. Shipping Coop

## Chapter II

## CAPONS AND CAPONIZING.

A capon is an unsexed male bird of the dual purpose or heavy breeds. Plymouth Rocks, New Hampshires, Rhode Island Reds, Wyandottes and Orphingtons make excellent capons. Altered Leghorns are not accepted as capons.

Because capons produce meat having better flavor and quality than unaltered males do, capons bring a better price and are therefore profitable to raise.

**When to Caponize**—The earlier the operation is performed the less the birds suffer from shock or set back. Therefore the operation is usually performed as soon as sex can be distinguished. With dual purpose birds this can be done by the time the birds are from 8 to 10 weeks old or when they weigh from 1 to 1½ pounds.

**Starving**—In order to perform the operation successfully birds must be starved 24 hours. They may have water to drink. This helps to clean out the intestinal tract. When starving, place them in a slat or wire bottomed crate off the ground where they can pick up nothing. A shipping crate turned upside down works well.

### The Operation

**The instruments**—There are many sets of instruments. No matter which kind are used, the set must have a knife to make the incision; a spreader to hold open the cut; a hook to tear the membrane covering the intestines; a blunt instrument to press back the intestines out of the operator's way and an extractor to remove the testicle. An extractor made like a forceps does a more complete job than one shaped like a spoon.

**The operating table**—Either a box or a barrel may be used for an operating table. If an old magazine is placed under the bird, a clean page can be turned for each bird. Club members should remember that this is a major operation, thus cleanliness is important. The instruments, when not in use during the operation, should be placed in a disinfectant solution. A 5% Lysol or carbolic acid solution works well.

**Tying down the bird**—Place a nail on either side of the barrel or operating table. Tie a long shoe string to the rear nail. Then wrap the string around both wings of the bird lying on its right side on the operating table. Place a "half hitch" around the bird's shanks. Draw the string as taut as a fiddle string and tie to the front nail.

**The operation itself**—After removing the feathers in front of the thigh, an incision or cut is made between the last two ribs. Care should be taken to hold the heavy hip muscle back over the thigh to prevent cutting into the muscle and causing bleeding. In making the incision, do not cut into the rib joint. This causes such a wide opening that the spreader will not stay in place. Also do not cut too near the back bone. Bleeding results and the lungs are punctured. Now the spreader is placed in the incision. If the cut has been made



Figure 7. Club Member Caponizing

correctly and the bird properly starved, as soon as the membrane covering the intestines is torn, the testicle may be seen. It is creamy yellow, about the size of a grain of wheat or a small bean and lies close to the back bone. Right back of it is a large artery which supplies the lower half of the bird's body with blood. Be very careful in extracting the testicle. Beginners should not attempt to extract both testicles from one side. The left one is removed first. The extractor is clamped firmly around the testicle. Then the instrument is turned

around completely several times. This draws out the testicle cord, insuring complete extraction and prevents bleeding. The cord is cut. The bird is now turned over and the process repeated on the right side. It is not necessary to sew the incision. As soon as the bird is released the hip muscle slides over the wound.

**Care after operation**—After the operation, the birds are put in a clean place where they cannot fly. They are fed soft feeds and milk for several days. Birds should be watched for "wind puffs"—that is, air gathering under the skin. If "wind puffs" occur, puncture the skin and press out the air. Disinfect the surface of the skin. Sometimes "wind puffs" have to be opened several times.

**Care and Feeding Growing Capons**—For this part of the project, the member should study Chapter I, since all growing stock are handled in the same manner.



Figure 8. Opening "Wind Puff"

**Fattening Capons**—In most instances capons need no fattening. When they have gained their growth, they are ready to market. But if they do require fattening, do not pen them up for more than 10 days before killing. Feed them 4 or 5 times daily, the amount which they will clean up in an hour. Then remove the feeders and darken the room so that the birds will rest until the next feeding time. The feed may consist of any mixture of grains to which is added some alfalfa leaves and flour or middlings.

Then add enough milk or water to make a batter-like mixture.

**Marketing**—Finished capons can be marketed at any season. However prices are usually better during the holiday season. If no local market is available, capons can always be marketed through a local turkey pool. If there are enough capons in one group, they are sold on grade as turkeys are. In this way more money is realized. When government graded and packed, even "slips" bring more than unaltered roosters. "Slips" are birds whose operation was not complete. They comb-up, crow and look like unaltered males.

For details of killing, dressing and preparation for market, the member should study Chapter VI.

**Demonstrations**—The most obvious demonstration in connection with caponizing is, of course, the caponizing operation. This is an excellent demonstration for a member to put on at a club meeting. However, unless the member works out some way to show a large audience, it is best to avoid the demonstration. The audience cannot see what is being done, thus the whole point of the demonstration is lost.

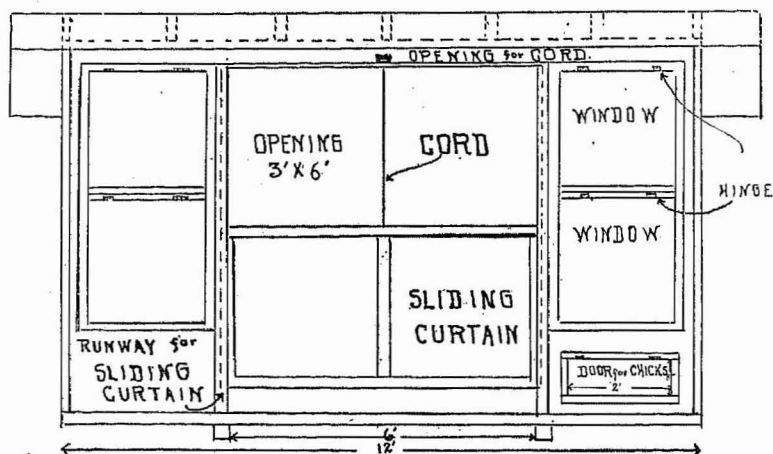
There are other demonstrations which a member taking caponizing work can use. Any of the demonstrations listed in Chapter I are good.

**Exhibiting Capons**—While a capon will not have to conform to requirements of the breed as given in the "American Standard of Perfection," as closely as other classes of poultry must, it is well to have a capon look as nearly like its breed and variety as possible. In exhibiting capons, one bird is an entry. A capon will be disqualified if not a true capon. It must show no comb or spur development. All other things being equal, the capon with greatest weight will be given first place. As with other birds, a capon's appearance will be improved if the feet and legs are cleaned and oiled and the plumage brushed and stroked with a silk cloth.

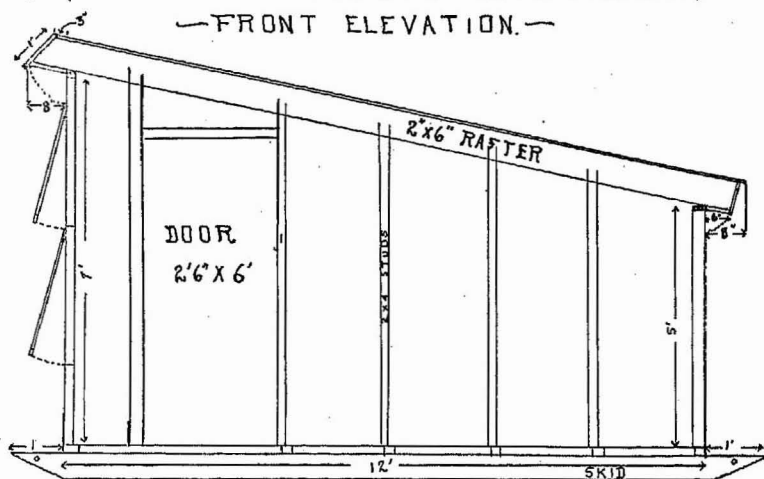
## Chapter III BABY CHICKS

The care and management of baby chicks is an exacting task. Club members should not attempt to raise them until they are thoroughly familiar with the job of growing young stock. Further they should not tackle the raising of chicks until they can have complete charge of them.

To raise chicks successfully, one must have an adequate brooder house; a good brooder stove or the equivalent; adequate brooder house equipment; a complete and adequate ration and good chicks.

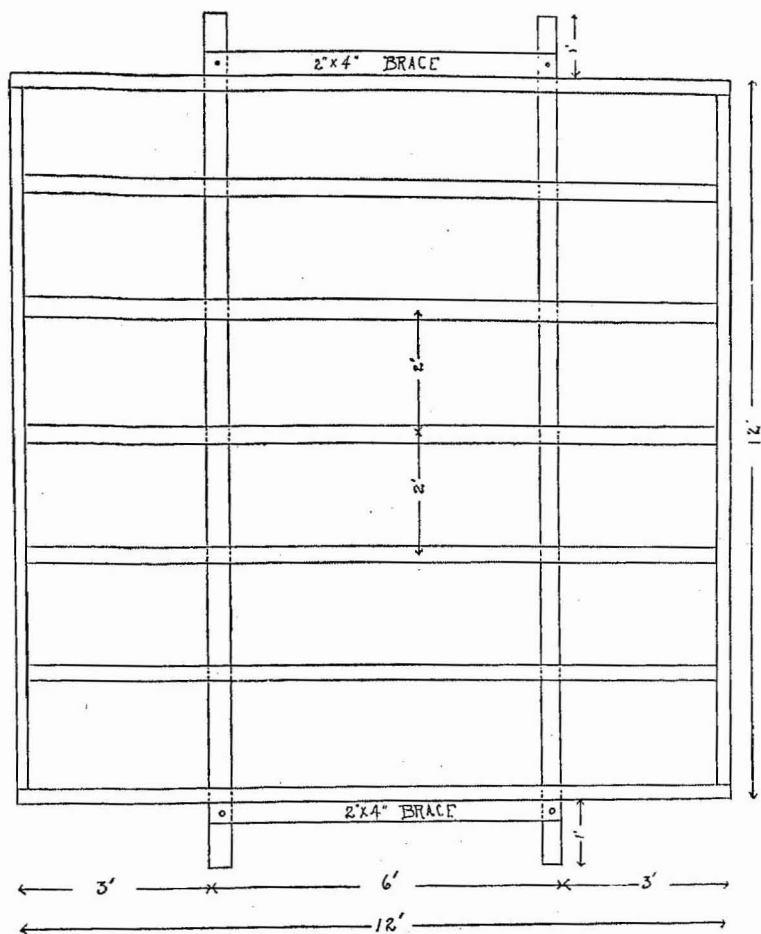


— FRONT ELEVATION. —



— SIDE ELEVATION —

Figure 9. Shed Roof Brooder House



ARRANGEMENT of SKIDS and FLOOR TIMBERS.

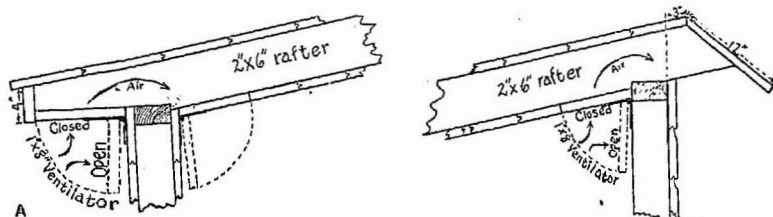


Figure 10. Ventilation and Floor Plan of Shed Roof Brooder House

## THE BROODER HOUSE

There are two types of brooder houses which are generally used in Montana, (1) the shed roof type and (2) the arch roofed type.

The essentials of a good brooder house are:

1. **Enough floor space**—Allow 1 square foot per chick. At least 1 square foot is needed for every 2 chicks from one to eight weeks. At that time the floor space must be doubled. Since chicks still need heat, it is better to start with 1 square foot per chick.

2. **A well ventilated room**—Although chicks need uniform heat, the room must be ventilated in order to keep the floor dry and the chicks healthy. A thorough study of the ventilators in the brooder house plans should be made.

3. **The house needs a floor**—Never put chicks on a dirt floor, especially if chicks have been raised on it before. A portable brooder house needs a wooden floor. A house with a "dutch oven" brooder works better with a concrete floor.

### Bill of Materials for 12' x 12' Brooder House

	No. Pieces	Size	Length
Skids .....	2	4x6	14'
Sills and floor Joists .....	2	2x6	12'
	7	2x6	11'8"
Braces .....	2	2x4	6'
Plates .....	2	2x4	12'
Studs - Front and Back .....	8	2x4	12'
Ends .....	5	2x4	12'
Rafters .....	7	2x6	14'
Roof — 6" sheathing 240 board feet 14'			
length — Flooring—1" x 6" matched floor			
ing, 180 board feet.			
Front roof projection .....	1	1"x12"	14'
Front ventilator .....	1	1"x8"	12'
Rear ventilator .....	1	1"x6"	12'
Facing for rear ends of rafters .....	1	1"x5"	14'



Ship lap — for siding — 240 board feet  
 Windows — 4, about 26" x 26"  
 Shingles — 8 bundles  
 Poultry netting —  $\frac{1}{2}$ " mesh. 18 linear feet of 36" width.  
 Other materials — door, hardware, nails etc.

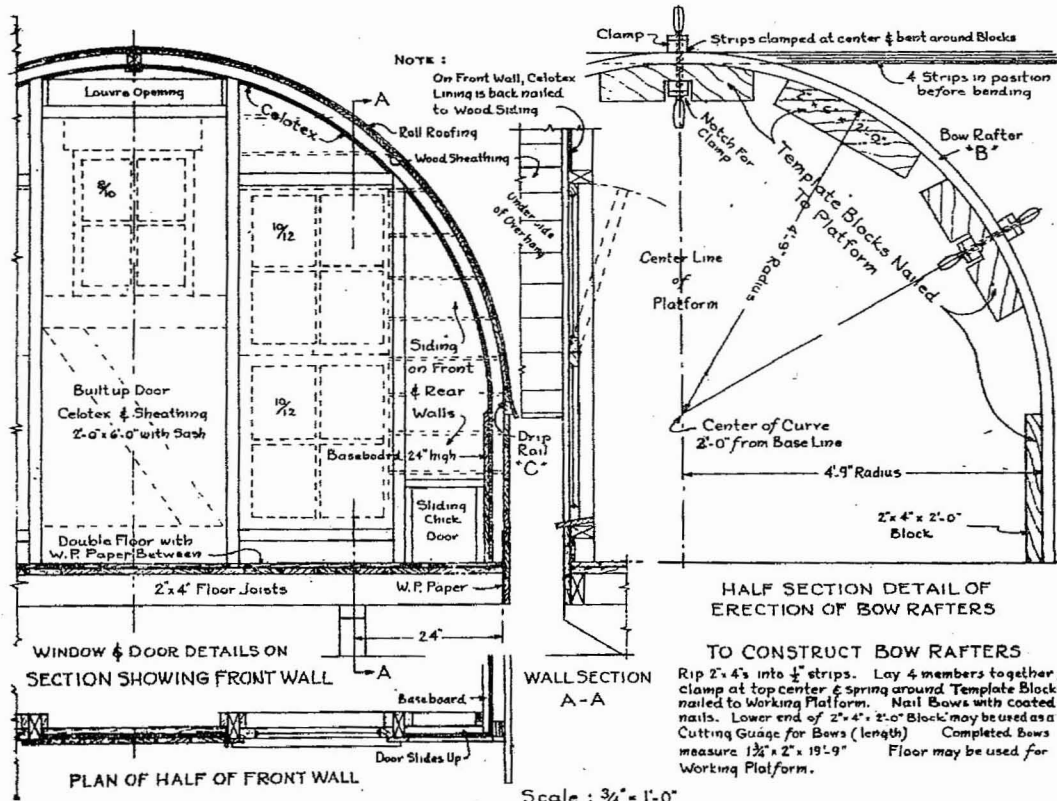


Figure 11. Arch Roof Brooder House (Courtesy Celotex Co.)

## Bill of Material

for

## ARCH ROOF BROODER HOUSE

7	2"x4"x10'—0"	Floor Joists
3	2"x4"x14'—0"	Door and Window Framing and Drip Board
4	2"x6"x12'—0"	Skid Runners
5	2"x4"x20'—0"	Bow Rafters (ripped 1/2" strips)
3	2"x2"x14'—0"	Front Wall Framing
6	2"x2"x 8'—0"	Back Wall Framing
23	2"x6"x12'—0"	T & G Dressed Flooring for Double Thick
	or	
22	1"x6"x12'—0"	No. 3 Boards for Rough Floors
26	1"x6"x10'—0"	T & G Flooring
42	1"x6"x14'—0"	T & G Roof Boards
24	1"x6"x10'—0"	Siding for Front and Back Walls
10	1"x6"x12'—0"	Siding for Side Walls
2	1"x5"x10'—0"	Louvre Boxes
1	1"x6"x10'—0"	Vent Doors
6	1"x12"x12'—0"	Wall Base Boards
40 lin. ft.	1/2"	Quarter Round
80 lin. ft.		Lattice
2 Rolls		Roof Felt or Equivalent of Shingles
4		Barn Sash 4 Lt. 10/12
1		Barn Sash 4 Lt. 8/10 (door)
3	1"x6"x12'—0"	T & G Boards for Door, 2'6"x6'6"
1	1"x6"x14'—0"	For Door Cleats
2	4"x24"	No. 20 Gauge Metal for Louvres
6 pr.		2" Butt Hinges
1 1/2 pr.		5" T Hinges
1		Latch and Lock complete for Door
5 lbs.		8d Cement Coated Nails
10 lbs.		8d Common Nails
6 lbs.		16d Common Nails
3 lbs.		8d Box Nails
5 lbs.	1 1/4"x3/8"	Head Galvanized Nails
9 lbs.	4"x10'	Celotex Sanded 18 or Equivalent of Similar Material or T & G Flooring

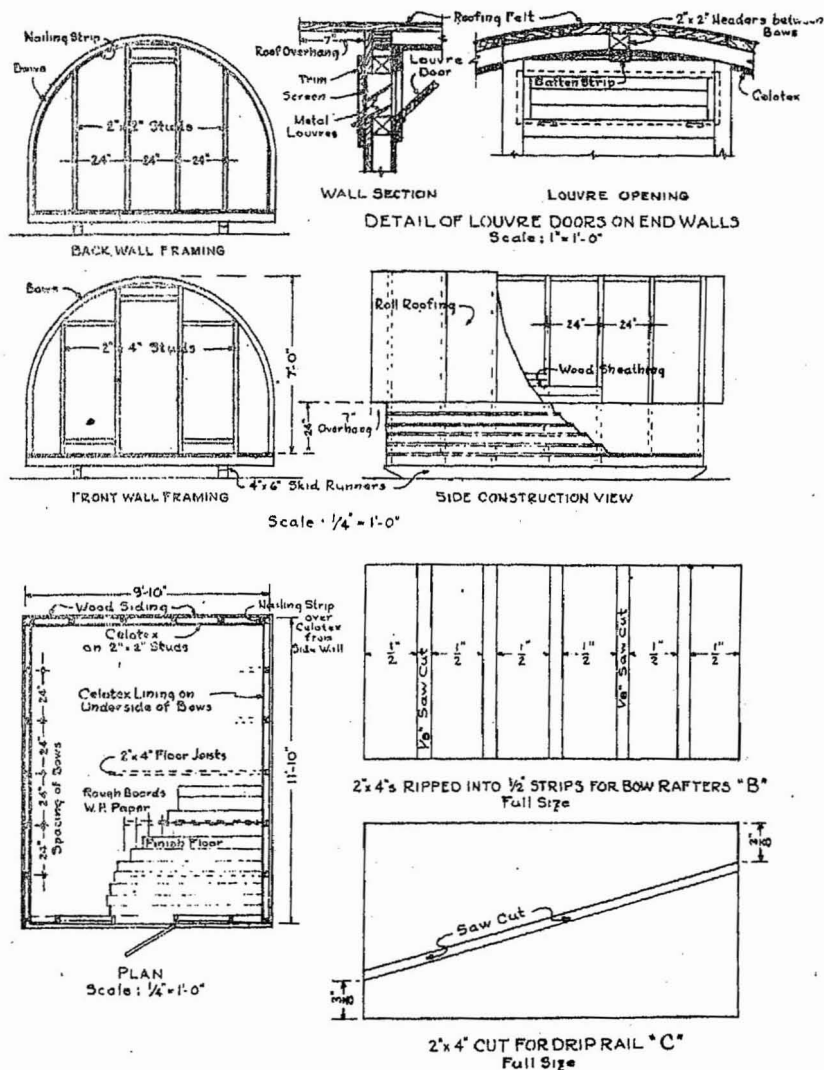


Figure 12. Details of Arch Roof Brooder House (Courtesy Celotex Co.)

### THE BROODER STOVE and HOVER

When brooding chicks, it is well to remember that when a mother hen hovers them, she sits over them. Thus, if their backs

are warm, they are warm. Therefore a good brooder stove with hover supplies the heat above the chicks. The kind of fuel used is immaterial so long as the source of heat is steady. The brooder stove should be run several days before the chicks arrive. If an old stove is used, all working parts should be checked.

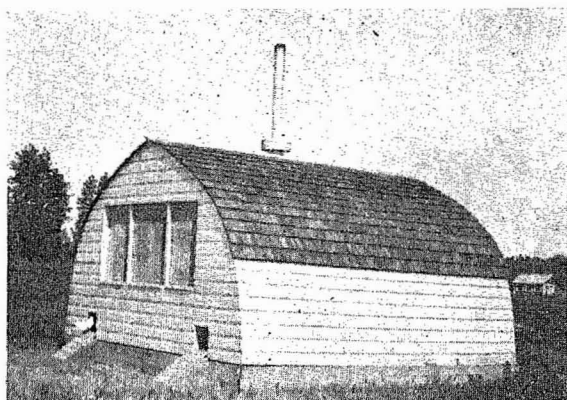


Figure 13. Arch Roof Brooder House.

The type of hover is also unimportant so long as each chick

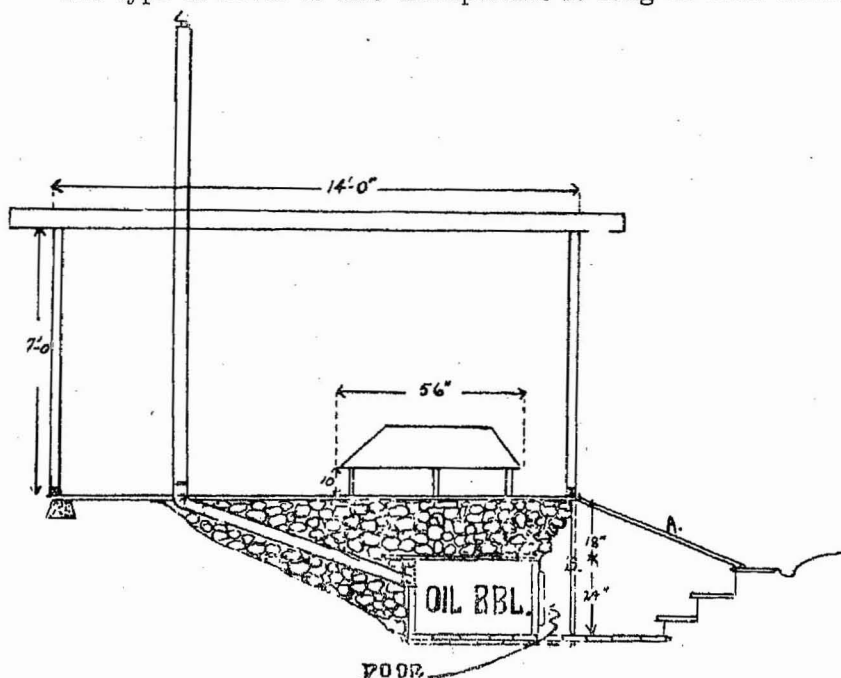


Figure 14. Front View of "Dutch-oven" Brooder

has 7 square inches hover space. Since the space should be doubled at 8 weeks, it is best to start with a generous hover.

A home made brooder may be built. Either the "Dutch Oven" or an electric type is satisfactory. Even the fireless brooder works in the brooder room if it has a steady temperature of 75° to 80°.

**"Dutch Oven" Brooder Stove**—The so-called "Dutch Oven" brooder stove, or the method of applying under floor heat for brooding has been successfully used in every section of Montana. It gives a dependable and constant source of heat at a low cost.

**Fire box**—The fire box may be made from an old oil barrel, heating stove, or it may be a brick or concrete fire box. The main thing is to have the fire box fitted with a tight door so that the fuel burns slowly. The fire box should be placed at least 18" below the surface of the ground with about a foot dug at either side of it. The entire space, around and over the fire box, is then filled with rocks or bricks and sand. The fire should be started at least 4 or 5 days before the chicks or poults arrive in order to have the sand and rocks thoroughly heated. Once hot, the temperature at the edge of the hover remains constant. The temperature will not drop even after the firing of the stove has been discontinued for 36 hours.

Be sure the fire box is placed back from the sill of the house to avoid any fire risk.

Place an additional door at A or B (see fig. 14) to give additional protection. The door prevents draughts and too rapid burning of fuel. When burning wood a grate is not needed, but with coal, a grate is necessary.

**The Pipe**—The pipe should extend 4 or 5 feet under the floor from the fire box, in order to have all the intense heat taken from the smoke and so remove all danger of fire.

**Floor**—The floor should be made of concrete, though wooden floors have been used by cutting out the floor a few feet above the fire box and filling the space with sand and gravel.

**The Hover**—The hover may be made of any material, preferably metal. The main thing is to have the hover about 10" from the floor and allow 7 square inches per chick and twice that amount of space per poult. Do not expect the chick to

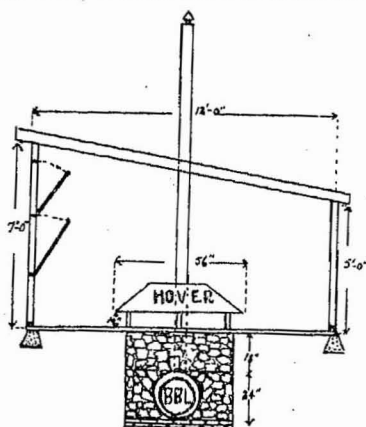


Figure 15. Side View of "Dutch-Oven" Brooder

sleep under the hover. Rather they will sleep in the space receiving the reflected heat as with any other hover.

**Home Made Electric Brooder**—There are a number of types of home made electric brooders, ranging from those using a heating pad to those using electric lights and resistance coils. A simple type is shown in figure 16.

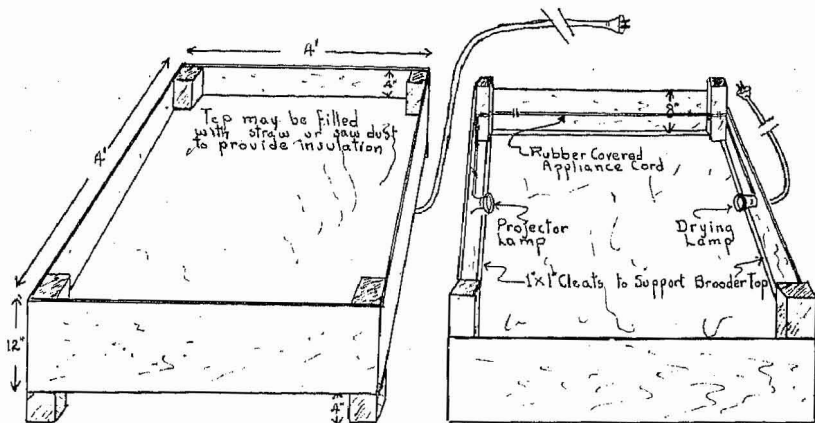


Figure 16. (left) Top and (right) upside down view showing wiring and lamps of Home-made Electric Brooder.

**List of materials**—The top and sides of the brooder are made of plywood, hard composition board or ordinary lumber. A 4'x4' brooder (capacity 150 to 200 chicks) requires:

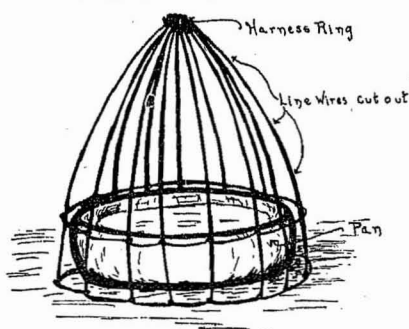
- 1 piece  $\frac{1}{4}$ " plywood 4' x 4' (top)
- 4 pieces  $\frac{1}{4}$ " plywood 1' x 4' (sides)
- 4 posts, 2" x 2", 16 in. long
- 4 cleats, 1" x 1", to support top
- 2 porcelain receptacles
- 15 to 20 feet appliance cord with plug
- 1 250-watt R 40 bulb drying lamp
- 1 150-watt projector or reflector Mazda spot or flood lamp (115 to 120 volt)

**How to build**—Nail sides to posts, put cleats on side pieces. Notch corners of top piece, and nail it on top of cleats. Put porcelain receptacles on sides (midway between posts and three inches from the top of the brooder). Bore hole for cord in one side near the receptacle and fasten electric cord to connections. If a member needs help with wiring, he should consult the public service company or store where he gets lamps, receptacles and appliance cord.

To save heat, put 2 to 4 inches of ground corn cobs, shavings or litter on top of the brooder. **Regulating the heat**—Screw the lamps in and turn the brooder on for an hour or so before putting the chicks under. In cold weather, tack a curtain to the sides, so it will reach almost to the floor litter. As chicks get older, the curtain may be removed. To reduce heat a 25-watt Mazda lamp may replace one of the bulbs. Never leave the socket empty. Heat may be regulated by the way the chicks behave. If they spread out comfortably under the hover the heat is O. K. If they bunch together, there is not enough heat. Too much heat drives the chicks from under the hover. As with all brooders a chick guard should be used until the chicks become "hover wise".

### BROODER HOUSE EQUIPMENT

**Feeders and Fountains**—Equipment should be provided to take care of the chicks' needs for more than a few days. Since



DRINKING FOUNTAIN PROTECTOR  
MADE FROM ELECTRIC WELD FENCING.

Figure 17. Drinking fountain protector made from electric weld lawn fencing. Note openings to permit hens to put their heads through to drink. (Maryland Exp. Sta.)

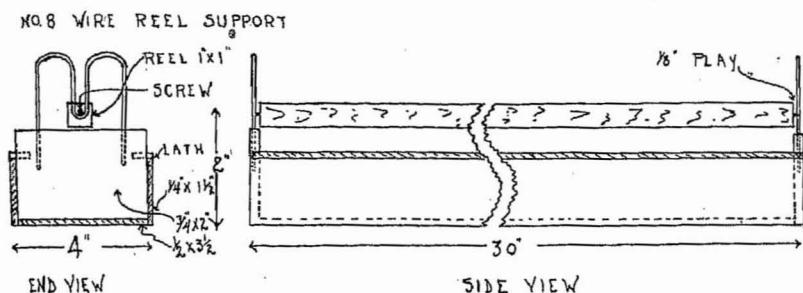
many commercial feeders and fountains are inadequate, it is recommended that club members make their brooder equipment. At least one linear inch of feeder and fountain space should be allowed per chick. If possible the equipment should be placed on hardware cloth or slat platforms. This keeps the floor clean and dry and safe for the chicks.

**Litter**—The kind of litter and how managed is important. There are several good commercial litters. These are satisfactory but expensive. Wheat straw, saw dust or alfalfa leaves may be used. Whatever litter is used, a floor covering of feed sacks sewed

together, washed and disinfected, should be put on the floor over the litter until the chicks learn to eat. Otherwise the chicks may fill up on litter and starve.

As stated above, fountains should be placed on platforms to avoid wet spots. If water is spilled, the wet litter should be dug up and removed.

There is no rule stating when the litter should be changed. Some commercial litters last a season. When the litter ceases to be dry and fluffy it should be changed. Many times, changing the



### CHICK FEEDER.

Figure 18

litter around the sleeping ring will be sufficient. Musty litter must be avoided, as it causes a chick disease called Aspergillosis.

**Chick Guard**—Chick guards are made of card board or wire netting covered with sacks. The guard need not be more than 12" high. It keeps the drafts from the birds and prevents chicks from wandering away from the heat until they become "hover wise". Avoid having any corners in the guard where chicks may crowd. The first day or two place the guard only a few feet from the edge of the hover, around what is known as the "sleeping ring". The guard is expanded a little each day. By the end of the first week it can usually be removed.

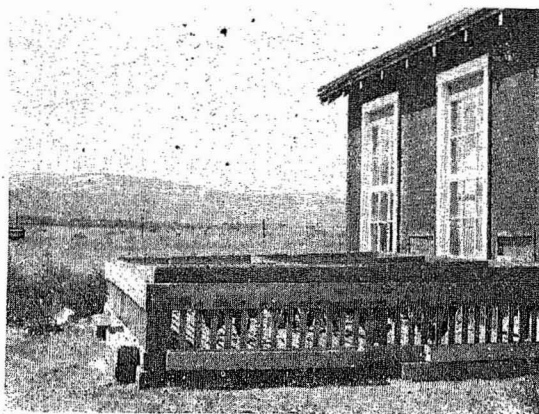


Figure 19. Sun Porch

**Sun Porches**—If the brooder house can not be moved to clean ground, a sun porch should be provided. A sun porch is a wire or slat platform with wire or slat sides. For chicks, a two foot side is high enough. It should be higher for turkeys. The sun porch should have the same floor space as the floor of the brooder house. When slat floor is



made, use lath, spaced 1 inch apart. For wire floor, use 1-inch mesh hardware cloth.

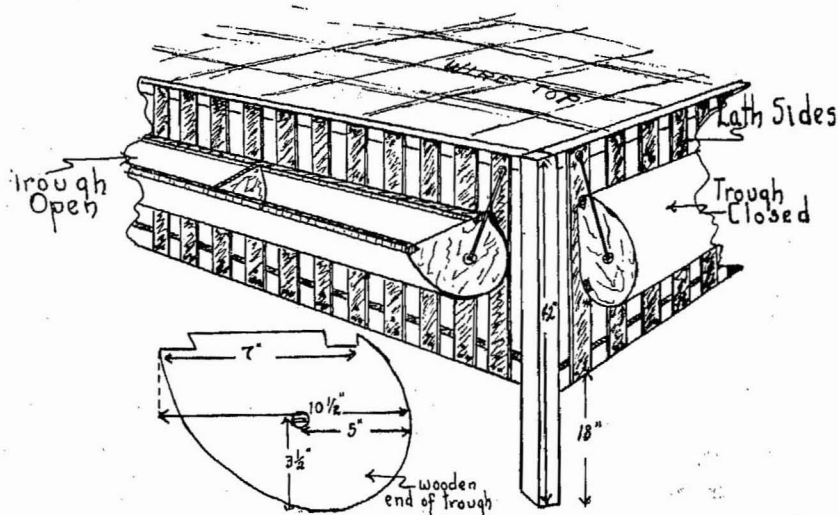
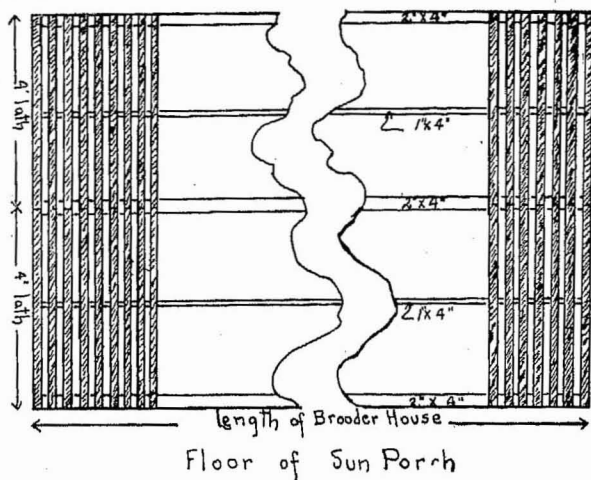


Figure 20. Plan of Sun Porch.

## THE CHICK

**Breed**—The breed to be chosen, depends upon: (1) the kind preferred at home; (2) whether the club or community has certain breed preferences, and (3) whether the birds are being raised

primarily for layers or for meat. If members are taking 4th year work and intend to carry 400 laying hens, the most satisfactory choice would be Single Combed White Leghorns or New Hampshires. If taking the Capon Unit, it would be wise for all the members to choose the same dual purpose breed. In this way greater uniformity could be attained when the birds are dressed. This is especially true if the members are planning to market the capons cooperatively and government graded.

**Quality**—Since the initial cost of chicks from healthy high producing hens is only slightly higher than chicks from unknown parentage, and since the former are sure to return a reasonable profit, it pays to buy the best. It certainly pays to buy Pullorum Tested chicks. By doing this, heavy losses during the first 10 days may be avoided. Unless the personal honesty and reputation of the breeder is known, it is best to buy from hatcherymen on the National Poultry Improvement Plan. U. S. Approved and Pullorum Tested means that the chicks' parents have been culled and selected for health and egg production and tested for pullorum disease with all reactors removed. There are higher grades of chicks produced by breeders cooperating with the National Plan. But these are not practical unless the club member is planning to go into the breeding business.

**How Far To Ship**—Do not purchase chicks which must be on the road more than 24 hours. Also do not get chicks which must make too many railroad changes. Chicks so shipped may be chilled and ruined.

### FEEDING CHICKS

The amount of feed necessary for the brooding period should be planned before the chicks arrive. Chicks will need at least 3 pounds of mash and 1 pound of scratch or wheat for the first 3 weeks. Study table 2 in Chapter I for weekly feed consumption.

A good starting mash may be purchased or made at home. A starting mash should contain 78% ground grains, 19% to 20% animal protein and bone meal, 2% calcium carbonate or oyster-shell, 1% salt and .002% manganese sulphate. The protein and minerals are used to build muscles and bone. The grains are used for heat and energy. The following are good starting mashes:

- (1) 20 pounds ground wheat  
 20 pounds ground yellow corn  
 5 pounds ground barley  
 10 pounds ground oats  
 15 pounds mill run  
 5 pounds dried skim milk  
 15 pounds meat meal (50% protein)  
 5 pounds alfalfa leaf meal  
 2 pounds bone meal  
 2 pounds ground oyster shell  
 1 pound salt  
 1 pint cod liver oil  
 4/10 ounce manganese sulphate

---

Total 101 pounds 4/10 ounce

- (2) 35 pounds ground wheat  
 13 pounds ground yellow corn  
 10 pounds ground oats  
 10 pounds ground barley  
 14 pounds meat scrap (50% protein)  
 5 pounds dried milk  
 2 pounds ground oyster shell  
 4 pounds alfalfa leaf meal  
 1 pound salt  
 1 pound cod liver oil  
 4/10 ounce manganese sulphate

---

Total 100 pounds 4/10 ounce

As with the growing mash described in Chapter 1, substitutions may be made when certain ingredients are not available.

The main difference between starting and growing mashes is the amount of animal protein. The same mash may be used for both ages of birds if the amount of scratch grains or wheat is regulated. That is, if a starting mash is to be used throughout the growing season, the amount of wheat fed must be greatly increased during the growing period so that the birds will not develop too rapidly.

## MANAGEMENT OF CHICKS

**Before the Chicks Arrive**—Have the brooder stove in operation and the house warm, litter covered with sacks, feeders and drinking fountains in place, and the guard about the sleeping ring. The feeders may be arranged like the spokes of a wheel from the brooder. This gives the chicks greater opportunity to feed.

**On Arrival of Chicks**—When the chicks arrive, open the boxes and note the condition of the chicks while they are in the express or post office. That is the place to file a complaint or refuse chicks, if something has gone wrong en route. Keep the birds warm on the journey home and put them under the hover as soon as possible. Count the chicks out of the boxes and give them a drink of luke warm milk or water. Some people dip the beaks into the milk. Others use a medicine dropper. The latter method takes practice to avoid getting the liquid into the windpipe.

TABLE 3. FEEDING AND MANAGEMENT SCHEDULE.

Chick Age	Temperature	Scratch	Mash	Drink	Green Feed	Management
1st Day	95° to 98°	*a little 5 times daily	*None	luke-warm skim-milk or water	None	1 sq. ft. floor space per chick. Use chick-guard 1st week, 2 ft. from hover at first, enlarging daily. Round corners of house to avoid crowding. See that chicks are comfortable at night.
1st Week	90° to 95°	5 times daily. Feed in shallow box lid or "cup-flat"	Keep starting mash in hoppers at all times. Provide 1" feeder space, allow 3 lbs. mash per chick for 8 weeks.	When feeding milk, reduce mash, increase grain. Give sweet or sour. Don't change from one to the other. Wash milk and water dishes daily. Scald once a week. Put fountains on platforms to avoid wet litter. Provide same fountain, as feeder space.	A little, chopped fine (½" length) at noon daily.	Get birds out of doors, weather permitting. Watch them when first out, until "hover-wise". Use sun porch if clean ground not available. Change or add clean litter when needed, at least weekly.
2nd Week	85° to 90°				Feed daily at noon amount birds will eat in half hour. Chop fine ½" length until birds can handle longer lengths	
3rd Week	80° to 85°					
4th Week	75° to 80°	3 times daily or put in separate feeder. Allow 1 lb. per bird for first 8 weeks.	Provide 2" feeder space			Start roosting before heat is removed. Have birds all roosting by 6 weeks.
5th to 8th Week	70° to 75°					
8th to 12th Week	Remove heat gradually when birds are feathered over their backs	2 times daily or in separate hopper. Allow 12 lbs. per bird Allow 2" feeder space per bird.	Gradually change to growing mash. Allow 7 lbs. per bird for 12th week to 24th. Provide 4 inches feeder space.	When milk and grain replace mash, give 3 to 4 gals. per 100 birds daily.	If green feed on range is good, none needed in addition.	Weather permitting, move to range. Double floor space if not removed to range.
12th Week to Maturity						

\*Some prefer starting with mash. In this case, scatter small amounts in shallow box lid or on cup on that first day. Start scratch second or third day.

Note 1—Have chick size grit or sand in separate hopper at all times after chick learns to eat.

Note 2—If eggs are fed, 3 to 4 per 100 birds daily. Hard boil for 15 minutes to kill bacteria which might be present. When feeding eggs reduce mash by half and double amount of grain fed.

Scratch grain may be scattered on a cup-flat from an egg case or in the cover of a shoe box to help the birds start eating.

It pays to watch the birds very closely the first few days. Birds slow in starting to eat may start toe picking. Birds which do not learn where the heat is may catch cold. Shove the chilly ones under the hover and work with the slow eaters. Sometimes by scattering bright marbles on the top of the feeders, the slow eaters' attention is attracted. This is especially true with poults.

The preceding table gives the main details of feeding and management.

### CLUB ACTIVITIES

As in Chapter I, this section is devoted to activities which make the club year more interesting.

**Tour**—In any project interest may be heightened by a tour. A visit to each member's home will be made more worthwhile if the chick management practices are scored when making the stop

## CHICK MANAGEMENT SCORE

Factors Scored	Scale or Points	Score
<b>1. Brooder House:</b>		
a. Do chicks have 1 sq. ft. per chick? (4)		
b. Does house have a floor? (4)		
c. Is house well ventilated? (4)		
d. Was the house disinfected before the chicks were housed (4)		
e. Are the corners of the house rounded? (4)	20	
<b>2. Brooder Stove and Hover:</b>		
a. Does the hover allow 7 sq. in. per chick? (8)		
b. Is the heat properly regulated? (8)	16	
<b>3. Brooder House Equipment:</b>		
a. Is 1 inch feeder space allowed per chick? (4)		
b. Have enough drinking fountains been provided? (4)		
c. Was the chick guard used the first week? (4)		
d. Were the roosts put in the house by the 4th week? (4)	16	
<b>4. Sun Porch:</b> Is an adequate sun porch provided where the house is stationary? or <b>Clean Ground:</b> Was the brooder house moved to ground which was not used by chicks last year?	8	
<b>5. Litter:</b>		
a. Is the floor properly covered with litter? (4)		
b. Is the litter dry and fluffy? (4)	8	
<b>6. The Chicks:</b>		
a. Are the chicks from Pullorum Tested Stock? (8)		
b. Are the chicks thrifty and vigorous (8)	16	
<b>7. Proper Ration and Feed Consumption:</b>		
a. Is the ration balanced? (4)		
b. Are the birds eating the proper proportions of mash and grain? (4)		
c. Are birds making proper gains for feed consumed? (4)		
d. Are birds getting green feed daily? (4)	16	
<b>Total Score</b>	<b>100</b>	

**Scoring Chicks**—A club meeting might well be devoted to learning how to score baby chicks as they are judged at a baby chick show. Advanced 4-H members might even sponsor a chick show.

### SCALE OF POINTS FOR JUDGING CHICKS

(Used by Northeastern Poultry Producers Council)

#### 25 Chicks to an Entry

Factor	Perfect Score	Remarks
Weight	10	Two pounds and one ounce is considered standard for an entry of 25 chicks. One point is deducted for every ounce under or above weight.
Vigor	30	A cut of $\frac{1}{8}$ to 2 points is made for each chick not showing maximum alertness when judged. Roundness of eyes, appearance of shank, and condition of down are considered in determining vigor.
Condition	30	A cut of $\frac{1}{8}$ to 2 points is made for each chick showing definite deformity—an imperfectly healed navel, pasty vent, signs of stick hatch or short, thin down.
Color	20	A cut of $\frac{1}{8}$ to $\frac{1}{4}$ point is made for each chick whose color of down or legs varies from the average.
Size	10	$\frac{1}{4}$ point is deducted for each chick varying from the average size.
Dead Chicks		Four points will be deducted from the score for each dead chick or for each chick less than the number required for full entry.

#### CONDITIONS ELIMINATING CHICKS FROM COMPETITION

An entry will be eliminated from competition if generally inferior and lacking breed characteristics; if showing evidence of disease or evidence of being fed.

**NOTE:** The mention of not feeding chicks refers to chick shows of day-old chicks exhibited by hatcheries and would not apply to 4-H members' shows

## SERIOUS DEFECTS

A cut of 4 points will be made for each chick showing the following:

1. Type of comb not characteristic of the breed
2. Sprig on comb of single-combed varieties
3. Feathers on shanks or down between toes of clean-shanked varieties
4. Color of down on shank foreign to breed
5. More or less the ordinary number of toes or web-footed condition in chicks.

NOTE: To learn about the characteristics of the various breeds and varieties, the club should have access to the "American Standard of Perfection." This book is too expensive for each member to own, but the club might buy one.

**Demonstrations**—Most of the demonstrations listed in Chapter I may be adapted to the baby chick phase of 4-H work. The buildings and equipment to be shown in a demonstration would be brooder houses and equipment used by chicks. Hovers, chick guards, sunporches and home-made brooders can be demonstrated.

## CHAPTER IV

### THE LAYING HEN

Many people do not make as much money from their laying flocks as is possible. The average farm flock production in Montana is about 100 eggs per hen per year, while co-operators who keep flock records in the state have an average of about 175 eggs per hen. More than that, many of the flock owners have made an average of over 200 eggs per hen per year. Since the number of eggs per hen per year is a very good indication of the profitableness of the flock, 4-H club members should do everything possible to make a good flock average. With good stock, properly housed and managed, the member should be able to do much better than the state average. If they do not, they will entirely miss the point of their 3rd and 4th year's work.

### THE HOUSE

Because the Montana Type House with the uneven span roof has proven to be satisfactory for Montana weather conditions, the member is urged to build according to these plans or to remodel an existing house to meet the specifications. A good house should be: (1) dry, (2) well ventilated, (3) have four square feet of floor space per bird, (4) warm, (5) light, (6) convenient and (7) as cheap as possible. The house shown in figures 22, 23 and 24 embraces these principles.



**The Floor**—The floor should be either wood or concrete. If concrete, first put down a layer of crushed rock and gravel. Over this lay a rough, 3-inch coat of concrete; then a layer of tar paper and then an inch-thick finishing coat of fine concrete. If using a board floor, it is wise to construct a double floor with paper between.

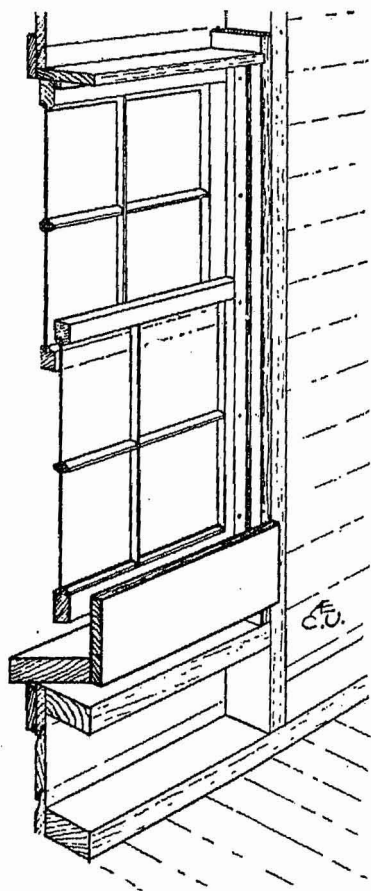


Figure 21. Cross-section of window inlet. Note that the window sill extends clear to the baffle board so that wind can not blow down to, nor across, the floor. (Courtesy N. Y. State College)

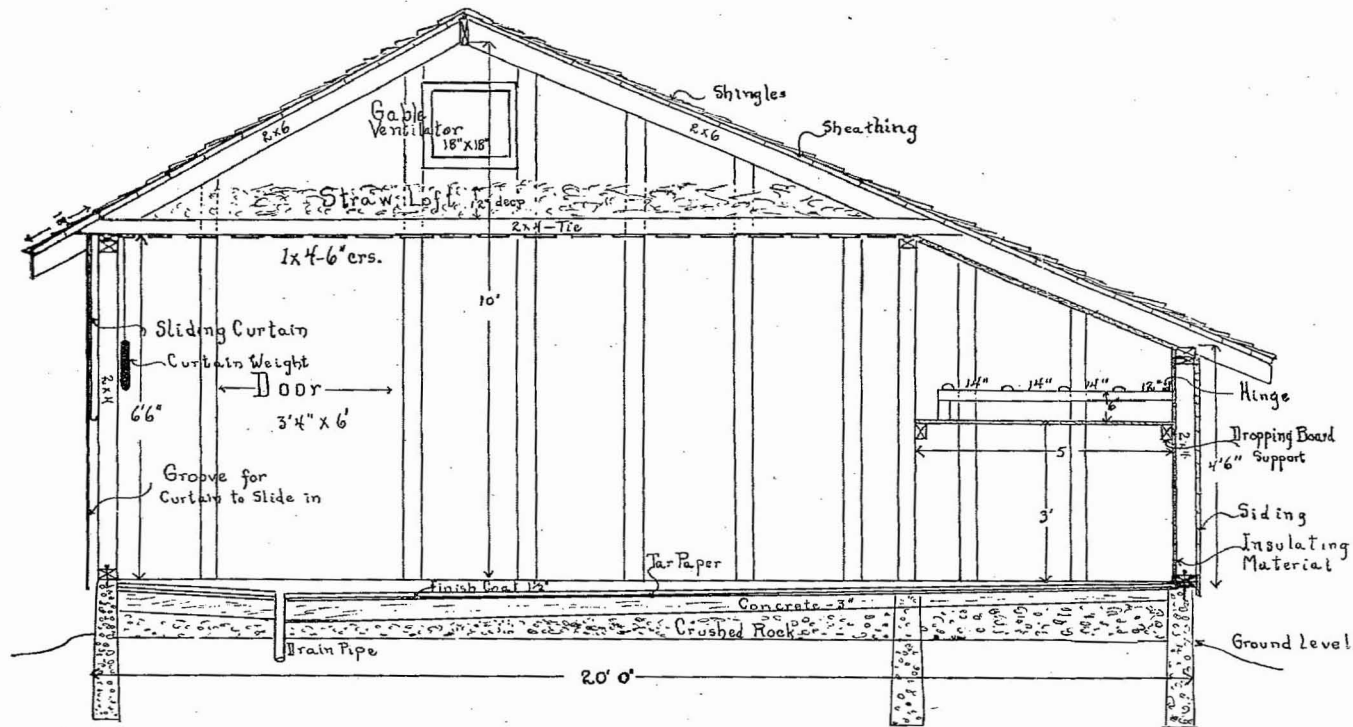
**The Walls**—The walls of the house should be built to provide a dead air space between the inner and outer walls. If using insulating board for the inner wall, cover it with lumber or fly screening. Birds soon pick great holes in unprotected insulating board.

**Ventilation**—The simplest way to ventilate a house is to take the fresh air in at the front windows and the foul air out through the straw loft.

The front windows may be a combination of glass and curtains as shown in Fig. 24 or they may be all glass. In the latter case the intake may be provided as in Fig. 21.

The straw in the loft should never be more than 12 to 15 inches deep. In this way the foul air will filter up through the straw and be carried out the gable ventilators. Be sure to have ventilators in each gable, as in Fig. 22. If sparrows are bothersome, it is well to screen the gable ventilators.

If the member feels that not enough information is given here, "Poultry Housing," Bulletin 221 may be obtained from the County Agent's office.



# END ELEVATION

Figure 22.

# Bill of Materials for 20x20 Laying House

Pieces	Kind	Length in Feet	
4	2x6	20	Sills
13	2x4	12	Front and rear studs
6	2x4	16	End studs
2	2x4	18	End studs
1	2x4	16	Post for supports
5	2x4	20	Plates (double)
13	2x6	16	Rafters (rear)
6	2x6	18	Rafters (front)
6	2x4	17	Ties
35	1x4	20	Ceiling board (to support straw in
530 square feet insulating material			loft and for ridge pole)
either insulating board or some sort			
of cheap flooring or ship lap.			
665 feet B. M.			
18 bundles of shingles.			Sheathing
1060 square feet building paper for			
sides—under insulating material and			
for roof over sheathing.			
2	2x4	20	Dropping board supports
125 feet B. M.			Flooring for dropping boards
12	2x2	12	Roost and roost supports
100 square feet "fox" wire for under			
roosts.			
2 windows 3' x 4½'.			
600 feet B. M.			
2	2x2	16	Siding
			For grooves for sliding curtains
2	1x4	16	
2	1x3	16	Sliding curtain frames
9	1x4	16	Corner finish and window and end
			ventilator frames
1	3 feet x 6 feet		Door
3 weights, sash cords and pulleys			
8 hinges			Dropping boards
1 set hinges			Door
1 latch			Door
30 sq. ft. chicken wire to cover			
inside of sliding curtains and gable			
ventilator doors.			
5 lb. 7d nails			
5 lb. 10d nails			
1 lb. 6d flooring nails			
15 lb. shingle nails			
12 ½" x 8" anchor bolts			
			Bolting sills to foundation
400 sq. ft. tar paper			
			Between concrete and finishing coat
58 sacks cement			
			Floor and foundation
7½ yd. gravel			
			Floor and foundation
11 cu. yd. sand			
			Floor and foundation

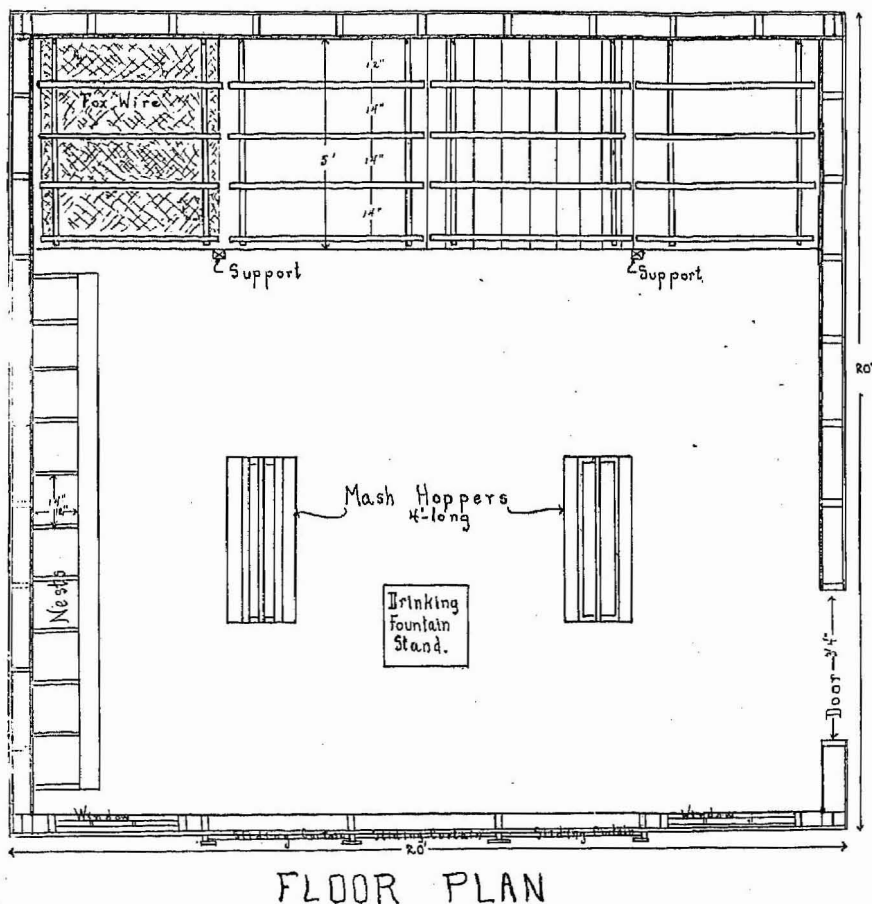


Fig. 23.

## LAYING HOUSE EQUIPMENT

The pieces of equipment for the laying house should be simply built, inexpensive, easy to clean and adequate for the number of birds housed. Each 20' x 20' unit should be provided with about 20 nests (allowing 1 nest for every 5 hens); 2 or 3 four-foot feeders; 1 large drinking fountain; a 5-foot dropping board with four 20-foot roosts; a catching crate or panel; a catching hook or net; a broodie coop and a hoe to clean the dropping boards. It is convenient to have a wheel barrow, a spray pump, a broom, and a small scrub brush.

**Mash Hopper**—There are many kinds of mash hoppers. The requirements are: that they shall provide 3 or 4 linear inches of

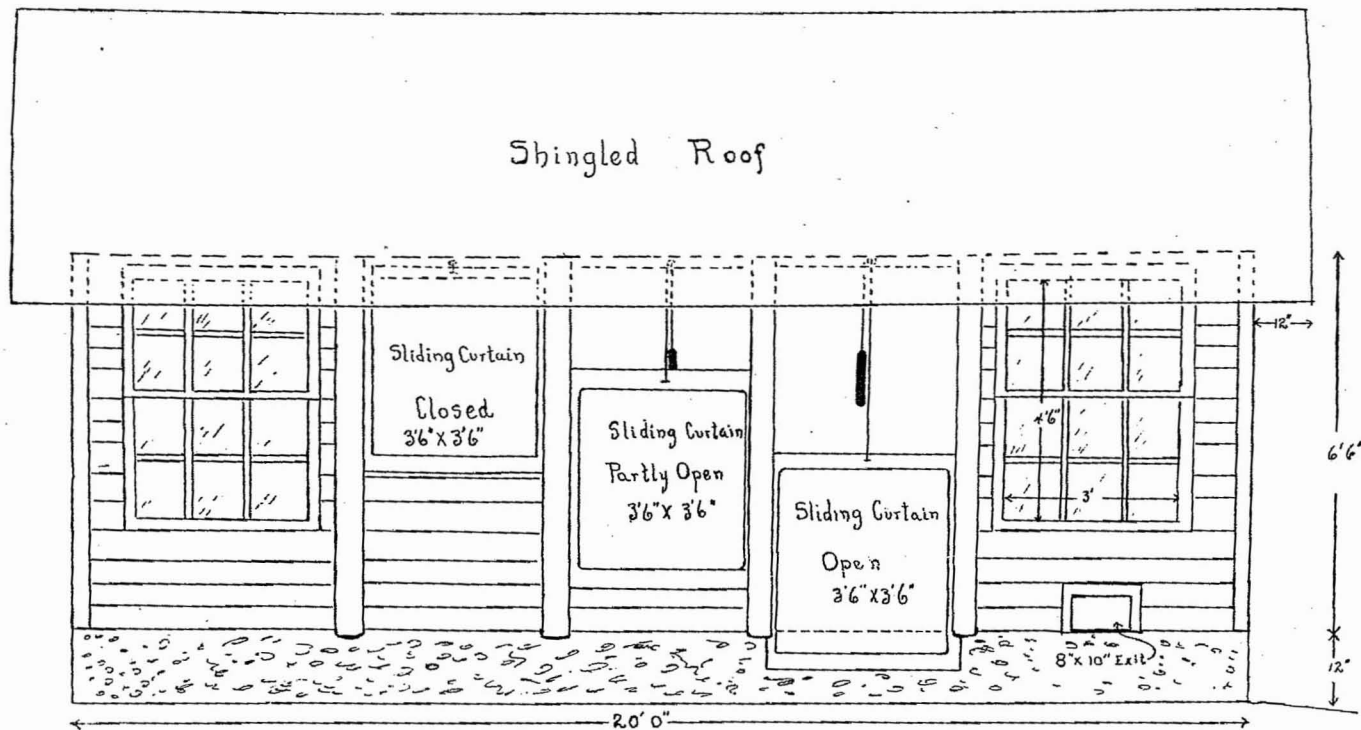


Figure 24.

FRONT ELEVATION



lay. Hens used to other types of nests just won't use them. For the "Clean Nest," see Fig. 28.

A comfortable nest is one which is about 12 x 12 inches.

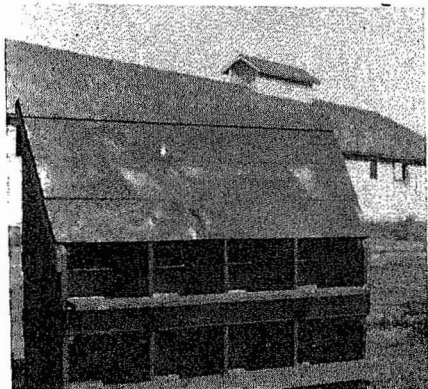


Figure 26. Open Nest.

**Water Fountains** — Many commercial fountains are on the market, both with and without heaters. However, there is no reason that a homemade one can not be made. In a day, 100 hens will drink about 3 or more gallons of water. Thus enough fountain space should be provided so that filling once or twice a day will suffice. Figures 28 and 29 give water fountain suggestions. Fountains should also be placed 15 to 18 inches off the floor. Some poultrymen place their fountains on a wash tub. This prevents spilling water and wet litter.

**Lights**—When electricity is available, lighting the house shortens the long winter nights. This gives them more chance to eat and consequently they will lay more eggs at a time when egg prices

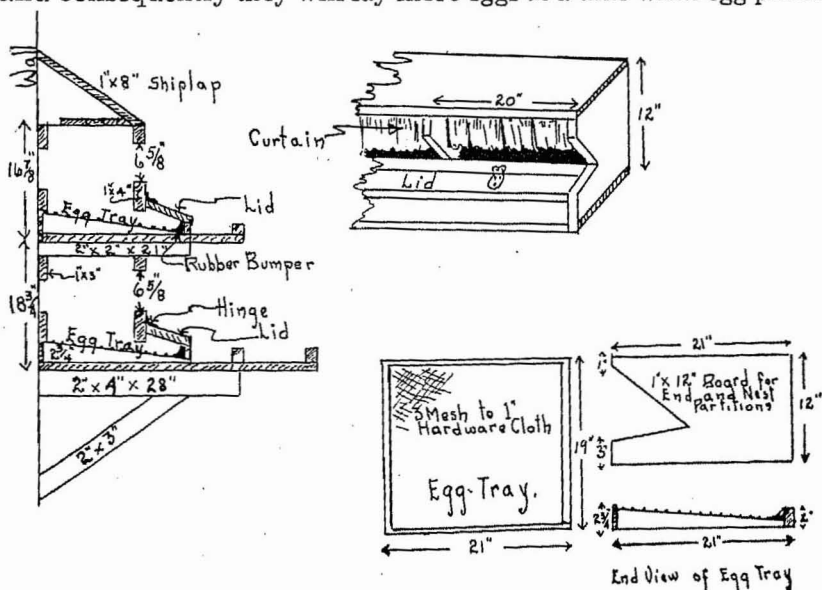


Figure 27. Clean Nest.

are high. Hens under lights come through the winter in better condition. Never give the hens more than a 14-hour day. Allow them to roost 10 hours. For a 20-foot x 20-foot house use two 40-watt bulbs with a 16-inch reflector. Place the lights midway between the front of the house and the roosts. Also have them placed 5 feet from the side walls and over the feeders. If possible make a switch connected with a clock. This will eliminate getting

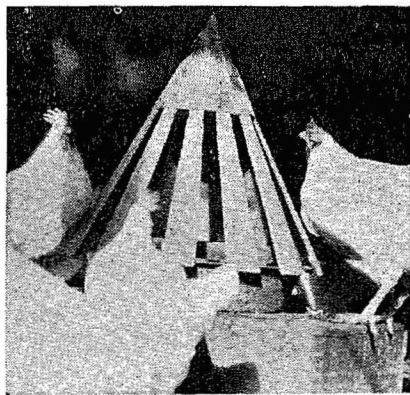
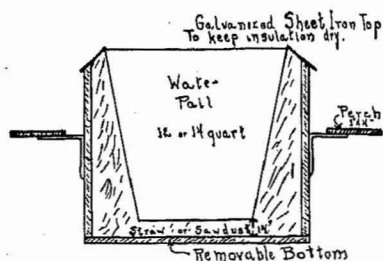


Figure 29. Drinking fountain with lamp under it to prevent freezing and protector over it to avoid contamination.



INSULATED WATER PAIL  
AND CONTAINER.

Figure 28. Insulated water pail and container. (Ohio Experiment Station)

up at 5 A. M. to turn on the lights.

**Litter**—Straw, shavings or sawdust makes a good litter. Change the litter when it gets packed down or dirty. Hens scratch away from the light. Therefore it is necessary to rake the litter from under the roosts and distribute it at the front of the house. The litter in a well ventilated house stays dry longer than in a stuffy one.

## FEEDING THE LAYING HEN

**Feeding Systems**—The main thing in any feeding system is to make changes slowly; to see that the birds have a balanced ration—that they have all the feeds and the proper ration as

cheaply as possible and to give the birds a feed which they like.

(1) Some poultrymen supply all the needs with an "all mash", which is fed in a hopper before them at all times. (2) Some feed laying mash in a hopper at all times plus 12 pounds of grain per 100 birds a day. The grain is fed in the litter at the rate of 4 pounds in the morning and 8 pounds at night. (3) Others use the cafeteria system. With this, both grains and mash are fed in hoppers before



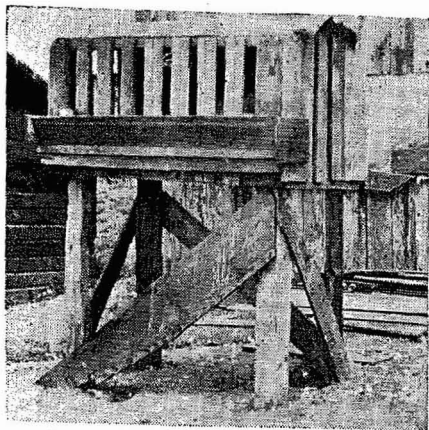


Figure 30. Broody Coop.

Ground wheat .....	30 lbs.
Ground corn .....	10
Mill run or Middlings	10
Ground oats .....	10
Ground barley .....	9
Alfalfa leaf meal .....	5
Meat Scrap .....	15
(1) Dried milk .....	5
Bone meal .....	2
Oyster shell .....	2
Salt .....	1
(2) Cod liver oil .....	1
Manganese Sulphate ..	0.002

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 100.002 lbs.

them at all times. This system works best for pullets, since older hens get too fat.

**Mash Formulas** — As with growing stock and baby chicks, good commercial laying mashes may be purchased. However, where the member can raise or home-purchase grains, it is often profitable to mix the laying mash.

The following is a good laying mash:

**Substitutions—**

1. When meat scrap and milk cannot be purchased, substitute 2 lbs. dried whey plus 5 lbs. cottonseed meal and 12 lbs. of soy bean meal.

2. When a guaranteed vitamin D tested fish oil is not available substitute 2.4 ounces of vitamin D supplement having 400 A.O.A.C. units.

## DISEASES

For a detailed description of diseases see Chapter VIII. This paragraph will merely list those troubles which are apt to show up during the time hens are in the laying house: (1) Vitamin Deficiencies due to lack of protective ingredients in feeds may show as leg weakness, colds, roup and loss of appetite; (2) Tuberculosis due to poor housing may occur; (3) Limber neck may be caused by spoiled or musty feed; (4) "Blow outs" or prolapsis may occur, because of heavy production or constipation; (5) Bronchitis, caused by a germ; (6) Bumble foot will happen when birds jump too far onto hard floors; (7) Fowl Paralysis, or true paralysis is caused by a germ; and (8) Troubles may appear, caused by parasites (that is, mites, lice and worms).

Table 4.

## LAYING FLOCK MANAGEMENT SCHEDULE

Job	When	How, What and Where
Feeding Mash	Daily	Put fresh mash in feeders every day. Give only the amount which will be cleaned up during the day. But if mash is left over, it may be mixed with water or milk and fed as a crumbly mash at noon.
Feeding Scratch	8 A. M. 4 P. M.	When feeding scratch in the litter, stir litter when necessary. Observe whether scratch is left over from previous feeding. If so, cut down on amount fed. If consumed, feed at the rate of 4 lbs. per 100 hens in the morning and 8 lbs. per 100 hens in the evening.
Feeding Green Feed	Noon	Feed all they will clean up in 1 hour. Feed alfalfa or carrots. If feeding alfalfa hay, put in a feeder or in the bale. Leave it before them at all times if the yolk color of the eggs is not affected.
Cleaning dropping boards	Daily	Hook up roosts, clean off dropping boards, sprinkle the boards with dry sand or gypsum.
Checking Ventilation	Morning Evening  Any time of the day	Open windows according to the weather conditions. Close windows according to weather conditions. Always leave some opening for fresh air intake. When sudden storms come up, check ventilation. If the day turns suddenly hot or cold, check ventilation.
Gather eggs	10 A. M. Noon 4 P. M.	Gather eggs in wire or ventilated baskets. Put clean nesting material in nests whenever necessary. Carry eggs to cool room or put in a humidor. In extremely hot or cold weather gather eggs more frequently.
Remove broodie hens	When gathering eggs	The sooner the broodie hen is removed the quicker she returns to laying. If broken up on the first day she should lay within a week.
Clean and fill water fountains	Each morning  Once a week	Wash fountains until no longer slimy. Fill with cool water in summer and with warm water in winter. Scald and disinfect fountains.
Turn on lights	5 A. M.	In order to avoid getting up, fix time switch to turn on lights. If not going to poultry house when lights are turned on, scatter scratch in litter, fill mash hoppers and water fountains the night before. Make changes in lighting slowly.
Turn off lights	At daylight	
Removing sick or injured birds	When observed AT ONCE	Each time a visit is made to the poultry house the birds should be carefully observed. Any bird not in perfect health should be removed. The cause of the trouble determined and rectified at once.
Delouse	When lice appear	At least once a week the flock should be checked for lice. If present, paint the roosts with a nicotine sulphate solution ½ hour before hens roost. Repeat in 10 days.
Cleaning house and adding clean litter	When litter becomes damp or dirty	Put about one foot of litter on the floor. Use straw, shavings or saw dust.
Culling	Every month Yearly	Birds which are out of condition. Pullets before housed and hens after laying 12 months.

## MANAGEMENT

Management of the laying flock is certainly a full time job. That is the reason the 4th year project requires a 400-layer flock so that the member may be amply repaid for a 7-day a week job. There is more to managing a laying flock than feeding the birds and gathering the eggs. The flock owner must know his birds. He must watch the birds, their house and egg production. The management jobs can be condensed into a management chart.

## CULLING

While culling is a part of flock management, it is such an important practice, it is given a separate heading. While a grand culling will be done at least once a year, the thorough poultryman practices some culling every month in the year. A hen which goes broody twice in a season should be culled. Sick birds must be culled. Hens that suffer "blow outs" or prolapsis should be culled, fattened and sold. Hens that start to molt early should be culled while dropping feathers, before they get pinny and can't be sold for meat. Besides all of this, pullets should be culled before they go into the laying house and hens should be culled in July or August.

**Pullet Culling**—When culling pullets, look for body characteristics and rate of maturity. The time to cull pullets is when they are about  $5\frac{1}{2}$  to 6 months old.

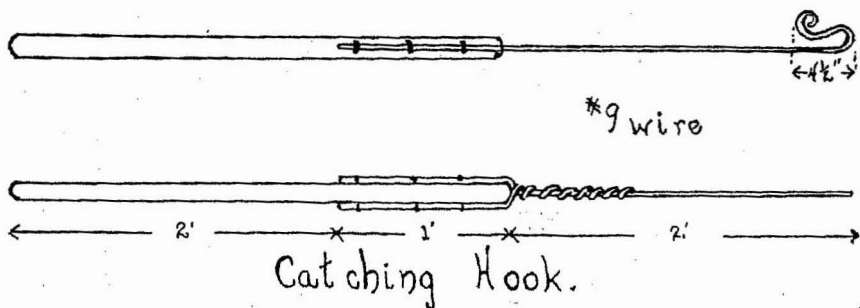


Figure 31. Catching Hook. (Courtesy California Experiment Station.)

Table 5. PULLET CULLING CHART

Characteristic	Keep	Cull
Rate of Development	Early maturing	Late maturing
Back	Broad, long, well carried out.	Short, pinched in at the tail.
Body	Deep	Shallow
Eye	Bright, prominent	Dull or sunken
Comb	Red, well developed	Small, pinkish, undeveloped
Legs	Moderate in length and yellow in yellow skinned breeds before laying	Excessively long and pale in yellow skinned breeds before laying.
Hock joints	Far apart, almost bow-legged in appearance	Knock kneed
Skin	Moist, has quality	Lacks quality, may be dry.
Disposition	Social, first up and last to roost	Shy, scary and inclined to stay on roosts.

**Adult Hen Culling**—After a hen has laid, her body undergoes changes of pigmentation and fat storage. A pullet which gave promise when housed may have to be culled after 9 months. Besides checking the hen for the desirable characteristics to be found in a good pullet, these added characteristics should be checked.

Table 6. HEN CULLING CHART

Characteristic	Keep	Cull
Pigmentation:	In yellow skinned breeds:	
Vent	Bleached after 2 weeks of laying	Yellow
Eye ring	Bleached after 3 weeks of laying	Yellow
Beak	Bleached after 4 to 6 weeks of laying	Yellow
Shanks	Bleached after 1½ to 3 months of laying	Yellow
Pelvic bones	Thin, pliable and far apart	Thick, stiff and close together
Abdomen	Thin, soft, pliable	Fat
Eyes	Bright prominent	Listless, sunken
Face	Clean cut	Fat and pouchy
Health	Active and in good flesh	Listless and may be excessively thin.
Molt	Late molter with ragged and worn plumage.	Early molter with smooth, oily feathers

**Culling Procedure**—A catching crate or panel is necessary in culling. Also a catching hook or net. Disturb the birds as little as possible when culling. To frighten them may throw them into a molt and out of egg production.

If a member is going to cull other people's flocks, be very sure that the culling technique is thoroughly understood. More harm than help will result if a member presumes too much. It must especially be recognized that when hens are resting, they frequently assume some of the characteristics of a non-producer. Then little stress is made on pliability or width between pelvic bones. Also the size of comb matters little when she is resting. But body shape is not variable, so that the out-of-production hen will be mainly judged by conformation. If the member really understands culling, there is no finer service that can be offered to the community. Busy people who understand culling will welcome a competent culler who will come to the ranch and cull the flock.



Figure 32. She Has Length of Back.



Figure 33. She Has a Good Body.

### **Production Judging—**

Each club member should enter a poultry judging contest. It is well to remember that production judging of poultry is nothing more than culling. The 4-H Judging Contest Card with explanation of points is included at this point for members' convenience.

Table 6.

## MONTANA EXTENSION SERVICE

## 4-H CLUB JUDGING CONTEST CARD

## POULTRY

## EGG PRODUCTION JUDGING

Class ..... No. ....

## Placing on Points

Points in Placing Class Value	1st	2nd	3rd	4th	Score
Constitution and Vigor.....25					
Body Conformation .....25					
Quality .....15					
Indication of Past Production .....25					
Temperament .....10					

Total Score

Average Score (Divide by 5)

Score on Points

Final Placing of Class

Score on Placing of Class

1st      2nd      3rd      4th

Final Score

**Explanation of points—****Constitution and Vigor—25 points**

Figure 34. She Saves Feed. (Courtesy U. of Ill.)

Head blocky; beak well curved; eyes bright, not sunken; well fleshed over breast bone with no surplus fat; no symptoms such as swollen heads, nostril discharge, thinness, limping, listless eyes, bumble foot, etc.

**Body Conformation—25 points**

Wide back carried through entire length; body deep at back with wide floor well carried

out; hock joints wide apart. Discount birds with especially long legs that show too much daylight underneath.

**Quality—15 points**

Thin pliable pelvic bones (dual purpose and meat birds slightly heavier than Mediterranean breeds but still pliable); pliable abdomen with velvety texture; back of



Figure 35. She Wastes Feed. (Courtesy U. of Ill.)

shanks pliable; no surplus flesh about face and eyes; wattles well tucked up; general pliability of entire body.

**Indication of Past Production—25 points**

Yellow-skinned breeds—Bleaching indicates length of production. Vent bleaches after 2 weeks of laying; eye ring, about 3 weeks; (ear lobe 3 weeks in white egg

breeds); beak, about 4 to 6 weeks; shanks, 6 to 12 weeks. Feathers of continuous layers lack oil. Early molting usually indicates short laying cycles.

#### Temperament—10 points

Good layers not excitable or nervous; stand easily in strange quarters; quiet when handled and have happy dispositions.

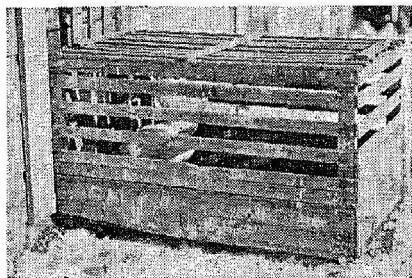


Figure 36. Catching Crate.

#### A Guide for Production—

The profit made depends not only upon the number of eggs per hen but also upon when the eggs are laid. Fall and winter eggs generally bring a better price than spring eggs. Table 8 is merely a guide for a profitable flock.

Table 7. Guide for Production

Month	Av. No. Eggs per hen	Month	Av. No. Eggs per hen	Month	Av. No. Eggs per hen
Oct.	8	Feb.	16	June	15
Nov.	15	March	16	July	15
Dec.	18	April	17	August	10
Jan.	18	May	18	Sept.	5
				Total	171

**Demonstration Farm Records**—In the 4th Year work the member is required to enroll in an adult poultry project known as the Demonstration Farm Project. In carrying this part of the 4th Year Club Poultry work, the member will receive the same consideration that any adult cooperator receives and will have the same duties. There is a memorandum of agreement between the cooperator and the State Extension Poultry Specialist. The cooperator agrees: (1) to purchase the record book, for the project, which costs 50c; (2) to keep the monthly record to the best of his ability; (3) to send the original white sheet of the month's record to the Poultry Specialist at Montana State College, Bozeman, Montana; (4) to make a complete inventory of all stock, buildings and equipment at the beginning and at the end of the year and to send the white copy to the Poultry Specialist. At the same time the Poultry Specialist agrees: (1) to give all record keepers a number; (2) to examine all cooperators' records (both



monthly and annually), make a complete summary of these and send a copy of this summary back to each record keeper; (3) to answer all questions which the record keepers ask; (4) to summarize all worthwhile poultry bulletins and articles received from out-of-the-state for the cooperators and (5) to visit each record keeper at least once a year.

This is a job for grown ups. It is hoped that advanced club members will realize the privilege which is offered them and will take their responsibilities seriously.

### CLUB ACTIVITIES

As in other units of club work, some thought may be expended to make the work more interesting and varied. Again a tour may be conducted at which the members will score the efficiency of each member's work.

#### Score for the Laying Flock

Factors Scored	Scale of Points	Score
<b>1. The House:</b> Is there adequate floor space? (7) Is the house well ventilated? (7) Does the house have a floor? (7)	21	
<b>2. Housing Equipment:</b> Is there enough feeder space? (4) Are there enough water fountains? (4) Are there enough nests? (4) Are there enough roosts? (4)	16	
<b>3. Litter:</b> Is the litter deep enough? (3) Is it dry? (2) Is it clean? (2)	7	
<b>4. General Sanitation:</b> Was the house disinfected before housing birds in fall? (4) Is the house free from lice and mites? (4)	8	
<b>5. Lights:</b> Are the lights placed correctly? (2)		

Is there enough light? (2)		
Are they used properly? (2)	6	
<b>6. The Hens:</b>		
Are the hens healthy? (7)		
Are they properly culled? (7)		
Is the rate of egg production sufficient for the time of the year? (7)	21	
<b>7. The Feed:</b>		
Are the birds getting a balanced ration? (7)		
Are the birds eating enough daily? (7)		
Are they eating the correct proportions of mash and scratch? (7)	21	
<b>Total Score</b>	<b>100</b>	

**Demonstrations**—Most of the demonstrations listed in Chapters I, II and III may be easily modified to illustrate practices used in connection with the laying flock. Thus it does not seem necessary to repeat them. After rereading the paragraphs on demonstrations in these former chapters and the 4-H Club Guide, a 3rd year member should be able to work out his or her own demonstrations.

**Exhibits**—For preparing and showing birds, the member is referred to the paragraph on this subject in Chapter I. Since male birds are rarely carried in 3rd and 4th year projects, it may be necessary to prepare single entries instead of trios or pens.

## CHAPTER V

### THE EGG

A normal healthy hen, when properly fed, usually lays a nearly perfect egg. The after-laying care determines the egg's final grade. Thus, to succeed, members with laying flocks must have a thorough knowledge of handling and marketing eggs. Also members taking the **Poultry Practices** unit, when grading eggs, will find the work more satisfactory if they are able to help producers with egg quality problems. Thus all advanced members should study this chapter carefully.

**The Effect of Feed upon Eggs**—Most consumers prefer eggs with light yolks, even when such eggs are apt to be lower in vitamin A. Therefore feeds which darken the yolk should be avoided. This means avoiding too much alfalfa and similar leafy greens. Yet to maintain the birds' health some green feed must

be fed. The operator sometimes has to experiment to learn exactly how much green feed can be given without affecting yolk color. Ordinarily 6% to 10% alfalfa leaf meal in the mash can be tolerated. If the layers get their green feed from pasturing, it is found that if the birds are housed until late afternoon, the yolk color is not affected.

Laying hens must never be fed water cress, mustard or fan weed. These plants have such a high sulphur content that if eaten, the eggs taste and smell like rotten eggs.

Hens on a vitamin D deficient ration will lay soft shelled eggs, no matter how much oyster shell is provided. They get their vitamin D from their alfalfa meal, cod liver oil and sunshine.

**Nest Care and Gathering**—Eggs should be gathered at least three times daily: at 10 A. M., noon, and at 4 P. M. More frequent gathering is necessary in extremely hot and cold weather. When the temperature inside the poultry house is below freezing, hair cracks occur in the shells which cause the egg to drop in grade. In very hot weather the interior of the egg is affected so that the grade is lowered.

Eggs should be gathered in wire or ventilated baskets so that they will cool quickly and the body heat be removed. Never gather in a feed bucket.

**Cooling**—As soon as eggs are gathered they should be placed in a cool room where the temperature is 50° or lower. Never put in a room with strong-smelling vegetables or kerosene. Eggs pick up odors and flavors. Cool 24 hours before casing.

**Cooling Devices**—If no adequate cooling room is available, a humidor or similar cooling device may be made. The humidor works on the principle of a desert bag or an iceless refrigerator. A frame for egg trays and cases is covered with burlap sacks. A pan of water is placed on top of the frame. Cotton flannel wicks are placed with one end in the water and the other end on the sacks covering the humidor. Water seeps slowly down the wicks, wetting the sides of the humidor. The faster the water evaporates the cooler the temperature inside the frame.

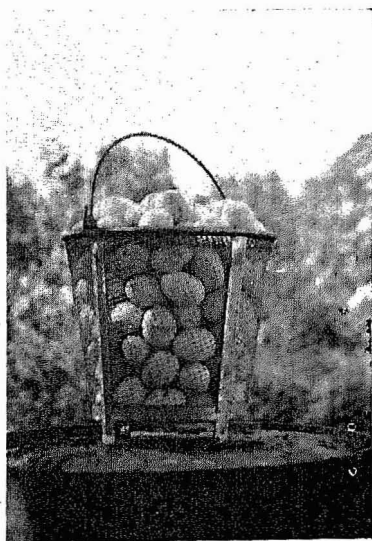


Figure 37. Egg Basket.

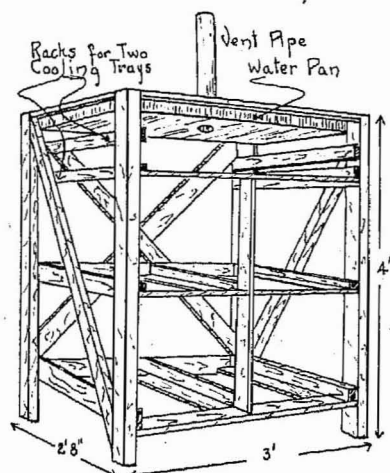


Figure 38. The Frame of the Humidor.

mercial candler is justified, a satisfactory home-made candler may be made from a 2-pound coffee can. The can is turned upside down and a hole is made in the bottom of the can (now the top), which will admit an electric light socket. A hole is made in the side of the can. Then a pasteboard collar is placed around the can with a hole the size of a 25c piece coinciding with the hole in the can. The candler is then fastened to a shelf above the candling bench, so that the hole in the candler is level with the operator's elbow. The cover of the can,

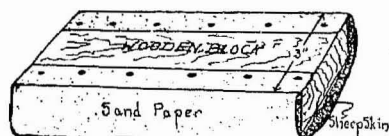


Figure 40. Egg Cleaner.

**Cleaning Eggs** — Never wash eggs. Washing removes the "bloom" or the thin outside coating, permitting entrance of molds and germs. Also washing causes evaporation and a lowering of the egg grade. If eggs must be cleaned, use sandpaper or steel wool. An egg cleaner may be made by tacking a piece of sheepskin over a board, then covering this with sandpaper.

**Candling** — Candling is the process of turning an egg before a bright light in a darkened room to ascertain the interior quality of the egg. While the purchase of an approved com-

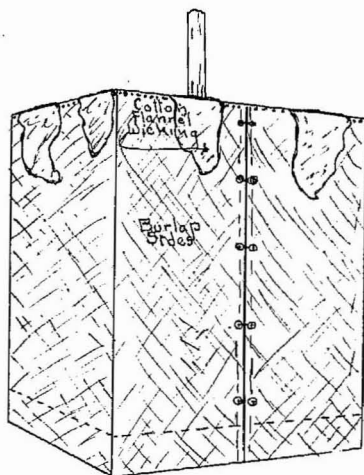


Figure 39. The Humidor covered with burlap with waterpan on top and outing flannel wicking in place.

which is now the bottom, may be removed to throw light upon the case of eggs being candled, in order to see whether the shells are clean. The cover is

replaced while the eggs are being candled. A 60-watt bulb in the candler will give sufficient light.

**Candler's Bench** — If many eggs are to be candled, the operator will save time if an efficient candler's bench is constructed (see fig. 43). The eggs to be candled are placed directly in front of the operator. The cases to receive the AA and A may be placed at the right while those to receive B and C grades may be placed at the left. The number of

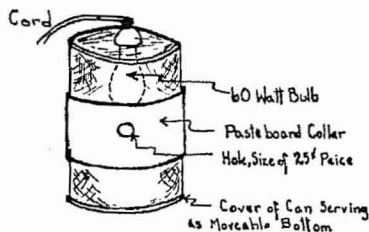


Figure 41. Egg Candler.

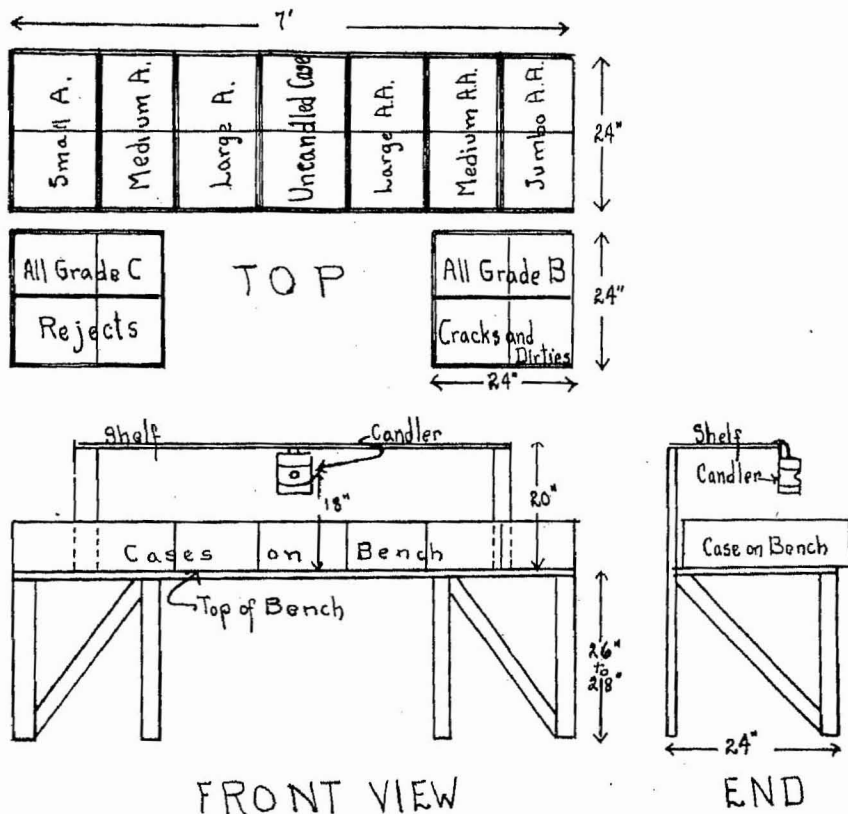


Figure 42. Candler's Bench.

cases needed is determined by the way the eggs are running and whether more than one color of shell is being handled.

**Egg Sizes**—Size and grade must not be confused. A top grade (AA) egg may be of large, medium or small size. The same is true for all other grades.

Table 8 — Egg Sizes

Size	Weight Specifications
Jumbo	Over 24 ounces to the dozen
Large	24 ounces to the dozen with no egg weighing under 23 ounces to the dozen.
Medium	21 ounces to the dozen, with no egg under 20 ounces.
Small	18 ounces to the dozen, with no egg under 15 ounces.

**Egg Grades**—The state of Montana has a State Egg Grading Law. Under this law all eggs sold to the consumer must be sold according to grade. The Montana grades are the same as those adopted by the federal government. The top grade is AA and must have a blue seal placed on the package, carton or sack. The second grade is A. It must bear the green seal. Grade B (the 3rd grade) must have a red seal and grade C (4th grade) a brown seal.

The factors which determine the grade of an egg are: The condition of the white and the yolk; the size of the air cell and the cleanness of the shell.

**Bench Card**—While there is no rule covering the way eggs shall be recorded when candled, many graders find the use of a bench card very helpful. When starting operations the number of eggs in each case on the bench are recorded. The grader then proceeds to candle and grade a lot of eggs until the entire lot is completed. Then the number of eggs in each case on the bench are again computed. Subtracting the opening bench count from the closing one will show the number of eggs in each class and grade of the lot candled. This figure will equal the total number of eggs delivered.

This bench card may also be used by members in an egg grading contest.

**Table 9**  
**Summary of Proposed United States Standards for Individual Eggs With Clean**  
**Unbroken Shells**

**Specifications of Each Quality Factor**

Quality Factors	U. S. Grade AA	U. S. Grade A	U. S. Grade B	U. S. Grade C
<b>SHELL</b>	Clean; unbroken; normal	Clean; unbroken; normal	Clean; unbroken; may be slightly abnormal	Clean; unbroken; may be abnormal
<b>AIR CELL</b>	One-eighth inch or less in depth; regular; or may be slightly tremulous.	Three-sixteenth inch or less in depth; regular; or may be slightly tremulous.	Five-sixteenth inch or less in depth; may show movement not in excess of one-half inch. The air cell may be free if it is small (not over three - sixteenth inch in depth).	May be over five-sixteenth inch in depth; may show movement in excess of one-half inch; may be bubbly or free.
<b>YOLK</b>	Well centered; outline slightly defined but no visible indication of being spread or flattened; free from visible defects or blemishes.	Fairly well centered; outline moderately defined but no visible indication of being spread or flattened; free from visible defects or blemishes.	Outline may be well defined; may be mobile; may appear slightly spread or flattened; may show definite but not serious defects.	May be plainly visible; may be freely mobile and cast dark shadow; may appear spread or flattened; may show clearly visible germ development but no blood due to such development; may show other serious defects that do not render egg inedible
<b>WHITE</b>	Clear; firm.	Clear; reasonably firm	Clear; may be slightly weak.	May be weak and watery; small meat spots or small blood clots may be present.

Table 10 — Bench Card

MONTANA EXTENSION SERVICE  
4-H CLUB JUDGING CONTEST  
BENCH CARD  
FOR EGG CANDLING

Name ..... Address .....

Grade	Bench Begin		Bench Close		Grade	
	Doz.	Eggs	Doz.	Eggs	Doz.	Eggs
AA.						
A.						
B.						
C.						
Cracks & Dirties						
Rejects						
Total						

Total.....

Remarks: .....

**Note:** In making a bench card for commercial candling, account must be taken of various classes of eggs as well as grades. That is, there must be places for the various sizes of each grade. Also space for white and brown shelled eggs must be allowed.



**State Egg Graders' License**—If many eggs are to be graded, it will be an advantage for a member to hold a State Egg Graders' License. To do this the prospective grader applies to the Inspector in Charge of the State Dairy Division, State Capitol, Helena, Montana, or one of his deputies. The applicant will be given both a written and an egg grading examination. When the examination is passed, the grader receives a state license upon paying a nominal license fee.

The holder of a license may sell his eggs to a retailer who in turn is not required to recandle them. Should a purchaser consider the grading faulty he does not penalize the grader without asking for reinspection by a state inspector.

In selling eggs on grade a premium of at least 5 cents can be realized. Therefore it pays to hold a grader's license.

**Taking Eggs to Market**—No matter how good an egg is, if it is not handled properly when taken to market it may be ruined. The egg case should be placed where it will receive the least jarring. If taken in a truck, put the case on the seat or well forward in the truck. Sometimes poultrymen put an old mattress or cushioning material in the truck when hauling eggs to prevent undue jarring. When reaching town, never let the egg cases stand unprotected in the sun or extreme cold.

Market eggs twice a week if a good storage place is not available on the ranch.

## EGG PRESERVATION

It usually pays to preserve eggs during the spring months when eggs are plentiful and cheap. There are a number of methods of preserving eggs. The best of these are the grease and the water glass methods. In either case, the eggs must be: (1) clean; (2) infertile when possible; (3) properly cooled; (4) candled to remove cracks and low grade eggs. Only AA grade eggs are profitably preserved.

**The Water Glass Method**—The principle of this method depends upon immersing eggs in a solution of water glass (sodium silicate). The solution gradually fills the pores of the shells with a glass like substance which prevents molding and spoilage.

1. Boil and cool the water used. Soft water is better to use than hard water.
2. Make a solution of one part water glass and nine parts of the water which has been prepared.
3. Place the eggs in a crock or glass jar. Do not process in a metal container.

4. Pour water glass solution over the eggs until it stands 1 inch above the top of the eggs.
5. Store the eggs in a cool basement free from odors or molds.

**The Grease Method**—The principle of this method is to fill every pore of the egg shell completely with grease to prevent evaporation and also to keep mold and germs from entering the egg. Use either a commercial or home-made grease. Both are made from a bees wax base with mineral oils.

1. Place a small amount of grease in the palm of the hand and rub the hands together until the grease melts.
2. Grease each egg until every bit of the shell is covered with grease.
3. The eggs may be wrapped individually in paper about 5x8 inches in size.
4. Place eggs small end down in a carton or case.
5. Place container in cool room free from molds and odors.
6. Change the position of container (turn if possible) every few weeks to prevent stuck yolks.

**Directions for making a home-made grease**—Melt an ounce cake of refined white bees wax. To this add 4 ounces of white odorless, tasteless vaseline or petroleum jelly. When completely melted and blended, put the container in a dish of very cold water or ice water. Stir until solidified. This makes enough preservative for over one case of eggs at a cost of less than one cent a dozen. Mineral oil may be used in place of vaseline. In this case, less oil than vaseline is used. **Caution**—Use very low heat when melting wax.

**Selling Preserved Eggs**—When preserved eggs are sold, they should be candled out of storage. They must be marked **PRE-SERVED EGGS** in addition to the class and grade.

**Sharp Frozen Eggs**—Many people with freezer lockers desire to preserve eggs by sharp freezing. The main objections to this method are: (1) Eggs must be broken out to freeze; (2) The entire contents of a container must be used as soon as thawed. Thawed eggs do not keep. Therefore it is well to use small containers. Also the number of eggs in the container should be marked on the package.

**Directions for Freezing**—Use only AA grade eggs. Break the eggs into a clean bowl and thoroughly mix the whites and yolks. Do not beat. A pinch of salt may be added. However salt is optional. Freeze at once at a temperature below zero. Some prefer storing whites and yolks in separate containers. Frozen whites

beat excellently when thawed. Be sure to mix the yolks well if freezing separately, as unmixed yolks become leatherly and cannot be used.

### CLUB ACTIVITIES

**Egg Shows**—Where several members are grading eggs, they may find it interesting to hold an egg show. Members of the State Dairy Division have always been most generous in giving their time to judge Egg Shows. Since one is striving for perfection at a show it is wise to have only AA grade entries. However the premium list can include Jumbo AA; Large AA and Medium AA. Further the show can be enlarged by repeating these classes for both white and brown shelled eggs.

Egg shows may be judged by the Score card used by the Northeastern Poultry Producers Council:

Table 11—Egg Show Score Card

Exterior Quality	
Size (total weight of exhibit).....	12
Uniformity of weight .....	12
Uniformity of color .....	12
Uniformity of shape .....	6
Shell texture .....	12
Condition .....	10
Interior Quality .....	36
Total	100

**Egg Grading Contest**—An Egg Grading contest is also an interesting club activity. A bench card as shown in Table 10 may be used by members during the contest when placing the eggs.

In putting on an egg grading contest it is well to have the judge follow the plan which has been worked out successfully at Montana State College. The judge candles all the eggs prior to the contest and writes a code number on the shell of each

individual egg. At the contest, each member is given his set of coded eggs which he candles and marks the grade on the shell; for example AA, A, B, C or Reject. Following the contest the judge checks back each contestant's set of eggs. The following sheet has proven useful in checking the contestants:

Table 12—Egg Candling

MONTANA EXTENSION SERVICE  
4-H CLUB JUDGING CONTEST CARD  
EGG CANDLING

BASIS OF SCORING (on 9-dozen Egg Contest)

Points Scored	Perfect Score	Score
Bench card correctly filled .....	10	.....
Speed in candling .....	15	.....
Accuracy of candling .....	75	.....
<b>TOTAL SCORE</b> .....	<b>100</b>	.....

### Cuts

#### 1. Bench

2½ points off for each grade inaccurately reckoned.

#### 2. Speed

3 points off for each 5 minutes or major portion thereof taken in addition to allotted 15 minutes.

#### 3. Candling

a. 2 points off for each egg placed one grade above or below grade.

b. 4 points off for each egg placed two grades above or below grade.

c. 6 points off for each egg placed three grades above or below grade.

d. 10 points off for each reject that is missed.

Grade AA	1 grade off.....	x2.....
	2 grades off.....	x4.....
	3 grades off.....	x6.....
Grade A	1 grade off.....	x2.....
	2 grades off.....	x4.....
	3 grades off.....	x6.....
Grade B	1 grade off.....	x2.....
	2 grades off.....	x4.....
	3 grades off.....	x6.....
Grade C	1 grade off.....	x2.....
	2 grades off.....	x4.....
	3 grades off.....	x6.....
Rejects not recognized .....		x10.....
		Total Cuts.....

**Note**—This is used by the judge, not the member.

**Demonstrations**—Chapter V, The Egg, particularly lends itself to demonstrations. A member could pick out a simple thing like showing “how to make an egg cleaner.” If a more ambitious demonstration is desired, “Producing Quality Eggs” could be given. The latter demonstration could combine making a clean nest, an egg cleaner, a humidior and a home-made candler.

The member should bear in mind that candling easily turns into an illustrated lecture. It is difficult to show a large audience how the job is done.

Home Preservation of eggs also makes a neat demonstration. The member could include making the egg grease.

## Chapter VI

## MARKETING DRESSED POULTRY

Sooner or later all members of poultry clubs need to know how to kill and dress poultry. For immediate use at home the head can be chopped off and the bird scalded in very hot water. This method must not be used under any other circumstance. To get top price the bird must be killed and dressed properly. This means being properly bled and dry picked or "slack scalded."

**Starving**—Before killing all birds must first be starved. All feed must be withheld for 24 hours. They can have water to drink. This helps to flush the intestinal tract. Place them in a wire or slat bottomed crate, off the floor so they can pick up no feed or filth. A shipping coop turned upside down works.



Figure 43. Sticking Knife.

**Killing**—When properly starved, with no feed in the crop, the bird is ready to be killed. Hang it so that the head is level with the operator's elbow. Kill it by cutting the jugular vein and destroying the last lobe of the brain. Use a long, thin stout blade for a killing knife.

Open the bird's mouth. Examine the back of the throat. Back of the cleft in the palate two veins may be seen. They look like the veins seen on the back of one's hand. To insure maximum bleeding both of these must be cut. If the job is properly done, the blood will run as if a faucet had been turned on. Count 10 to be sure of complete bleeding, then turn the knife and drive it into the lobe the brain marked D in Figure 46. The knife may be put through the cleft in the palate at C in Figure 46 or B in 45. Some prefer to "stick" through the face in front of the eye to go into the lobe at D. When the lobe of the brain is struck, the main tail feathers of a turkey will immediately contract with a shiver, then will relax as soon as the brain is destroyed. When the medulla or the last lobe of a chicken's brain is hit, the bird gives a peculiar involuntary squawk. The sound is difficult to describe, but once heard, always remembered. The operator is now finished with the knife. It should be laid down where it will not be lost in the feathers while the bird is being picked. Also it must be put where

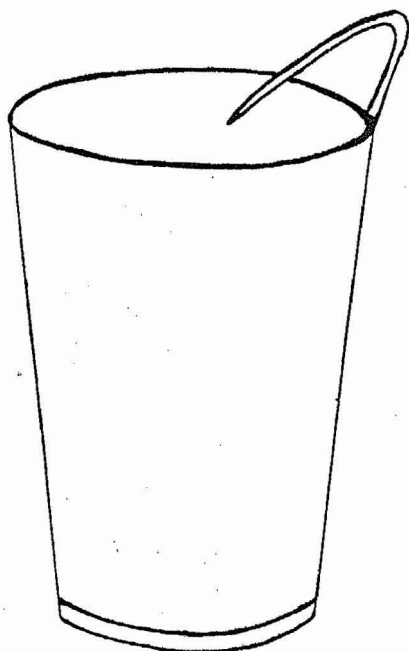


Figure 44. Blood Cup.

it can injure no one. A very nasty cut may be received if the knife is carelessly dropped into a pocket.

As soon as the bird is bled and stuck, hang a weighted blood cup on the bird's lower beak. The blood cup prevents messiness and holds the bird's head down. If not used, the bird sometimes draws blood up into its crop. If not decropped, such a bird soon smells vile from decomposed blood. Such a bird will be rejected.

**Picking** — The bird is now ready to pick. If dry picking (turkeys are usually dry picked), first remove the main tail feathers, then the main wing feathers. Take these out

with a twisting motion. Next pick the back and then the rest of the bird. Be careful not to tear the skin over the feather tracts on the breast and hips.

**"Slack Scalding"**—Many prefer to "slack scald". This is especially true for capons and fryers with tender skins. This method can only be used where a cooler with a temperature of 29° to 34° is available or when the outdoor temperature is that low.

An accurate thermometer is necessary to determine the water temperature of the scalding vat or tub.

Kind of Bird	
Capon or Fryer or Turkey	
Old Hens	

Water Temperature	
125° to 128° F.	
128° to 132° F.	

Douse the birds up and down in the water for exactly one minute so that the hot water will penetrate through the feathers. Be sure to use a watch with a second hand so that the birds are kept in the water for the entire minute.

Hang the birds to pick as in dry picking.

If properly "slack scalded" the bird will look like a dry picked bird but will pick almost as easily as a hard scalded one. Note the difference between the appearance of the hard and "slack scalded" birds in Figure 47.

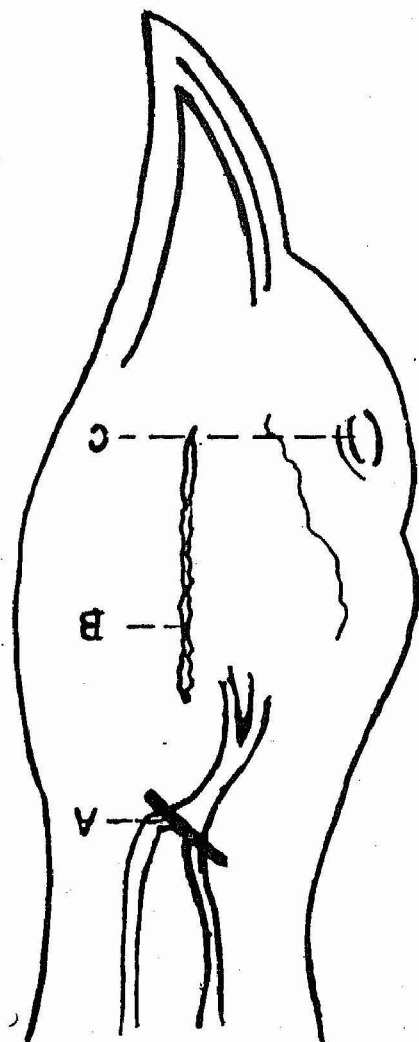


Figure 45. For proper bleeding cut jugular vein (A). The vein is found just back of the cleft in the roof of the mouth (B), which starts just below the ear (C).

**Decropping**—Though properly starved, a bird is frequently killed which did not get the feed removed from its crop. These should be decropped while still warm. To decrop, make an incision between the shoulder blade and the back of the neck. Reach into the body, loosening the flesh from the crop, and draw it out without breaking it. Cut above and below the crop. Then sew up the incision with what is called the "base ball stitch," using No. 40 white thread. Bring the needle from under the cut up through the flesh, first from the right side and then from the left. If the flesh is pulled firmly together, the thread will scarcely show and all air will be excluded. This prevents drying and spoilage. The same stitch is used in sewing tears on the carcass.

#### **Cleaning Up the Carcass—**

When the bird is fully picked, before cooling, the feet and mouth should be washed and material removed from the vent. Care must be taken to get no water on the carcass.

#### **Cooling—**

No matter whether dry picked or "slack scalded," the bird must be cooled 24 hours or until the internal temperature is 36° or lower before it can be delivered for shipment. If a bird is to be delivered undrawn (most birds sold to pools and butcher shops are so sold), it must not be allowed to freeze until all body heat has been removed or the bird will be "green struck." That is, the frozen outer surface does not permit the cooling of the inner part of the bird before decomposition sets in. When properly cooled, the fat in the abdomen becomes hard like a tallow candle.



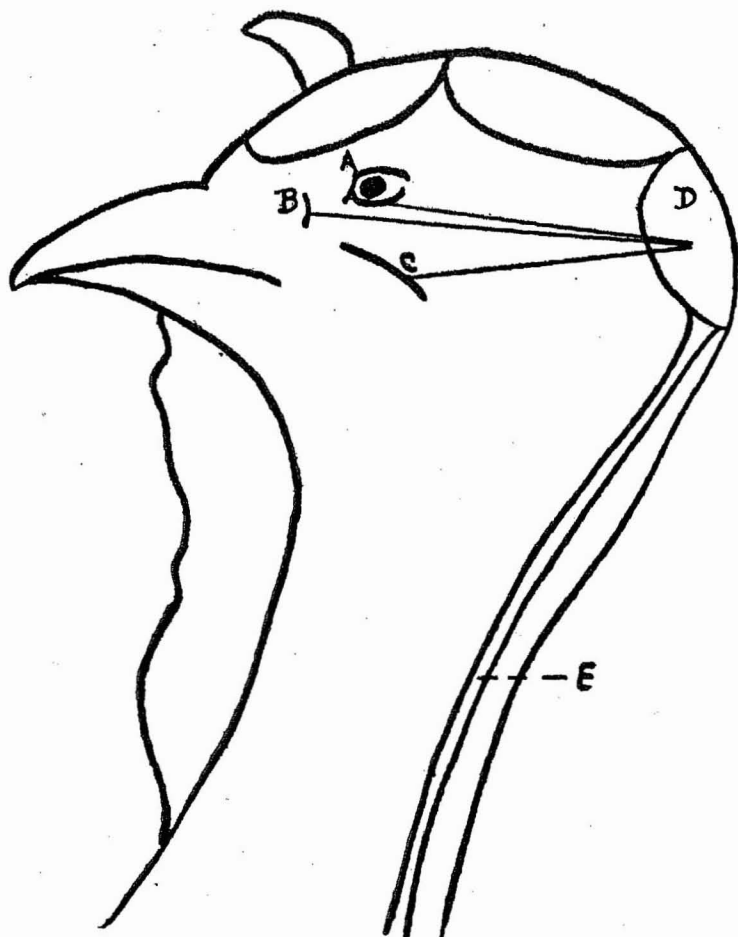


Figure 46. The brain (D) must be pierced to loosen feathers. To reach the brain the knife may be inserted at the edge of the eye (A), just in from the eye (B), or in the cleft in roof of mouth (C). The Spinal cord (E) connects with the brain.

**Sharp Freezing**—Putting birds into the freezer locker for home use is a good practice, especially for fryers which over cook when canned. For the freezer locker, birds should be either dry picked or "slack scalded". Hard scalded birds become rancid within a few months of storage. Sharp frozen birds must be drawn with feet and heads removed. The birds may be washed and ready for cooking before being frozen. For fryers, many prefer to cut them up. It is just as well to leave larger birds whole so that they may

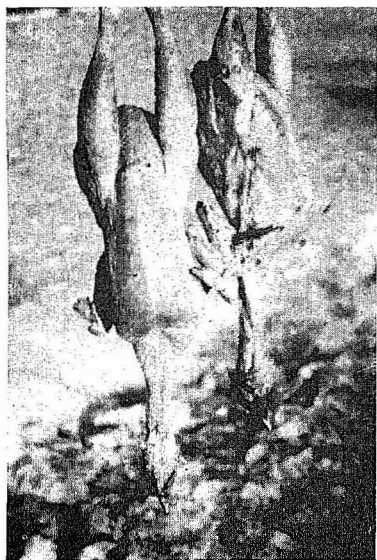


Figure 47. "Hard Scald" vs. "Slack Scald." Note the skin abrasions and scuffed areas on the hard scalded bird.

neck itself is removed. The neck may be placed with the giblets. Now the bird is ready for trussing:

1. Choose a long stout needle and strong twine.
2. Insert the needle through the breast at the base of the thigh, working from right to left. The drum sticks are pushed forward so that the needle goes into the breast behind and under the drum sticks.
3. Now working from left side, the needle is inserted through the openings formed by the wings folded back of the body and drawn out at the right side of the bird. The string is cut leaving 3 or 4 inches for tying.

be roasted. After the birds are drawn and washed, the giblets may be wrapped in a waxed paper and placed in the body cavity. However prepared for the locker, the bird will dry out less if wrapped in cellophane or pliofilm before the freezer locker paper is wrapped around it.

**Trussing the Bird** — In order to occupy less space in the locker, the roasting bird should be trussed before it is wrapped for the locker. A trussed bird, carefully wrapped in cellophane, may bring a premium for the member selling directly to the retail trade. A trussed bird has greater eye appeal, because of the neat compact package.

After the bird's head and feet have been removed and the bird drawn, the skin at the back of the neck is slit to the shoulder. The

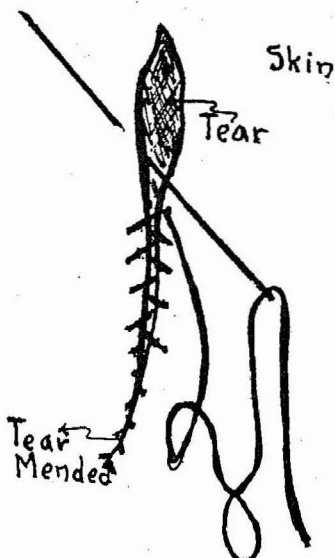


Figure 48. Baseball stitch for sewing tears in skin.

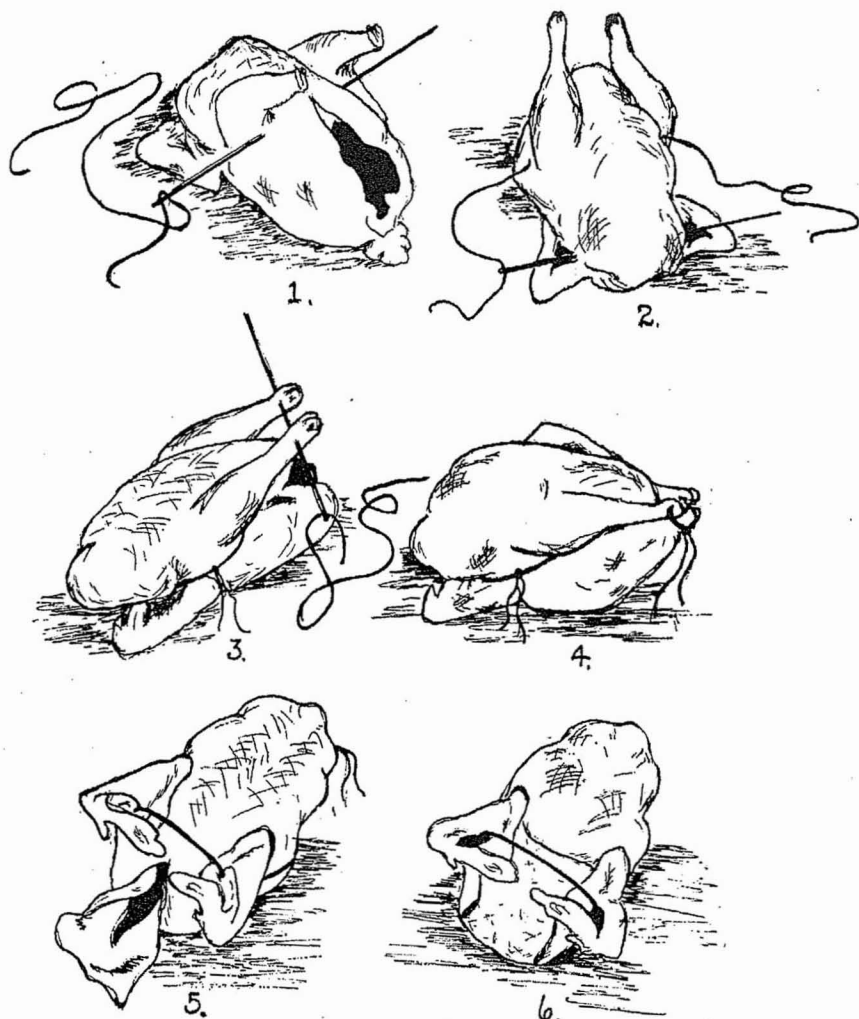


Figure 49. Trussing a Bird.

4. The string is now tied to the end of the string that went into the right side of the breast. This causes the bird's body to be drawn up into a compact shape. See No. 3 of figure 49.
5. Insert the needle between the two bones at each end of the drum stick joint and bring the cord around the tail (No. 3
6. Tie, so the legs fit closely at each side of the breast bone

and are secure to the tail. This closes the vent opening (No. 4 of figure 49).

7. Turn the bird over and fold the neck skin under the string and wing tips (No. 6 of figure 49).

When birds so trussed are to be stuffed for the oven, the string around the drum sticks is loosened and the dressing put into the body cavity. Also the neck skin is pulled out from under the wing tips, dressing put into the cavity where the crop was. The neck skin is put back under the wing tips, and the the drum stick string retied. Now the bird is ready for the oven.

**Head Wrapping**—It pays to head wrap undrawn birds, even when the head wraps are removed when arriving at the pool. Certainly undrawn birds which are sold locally should be head wrapped. Figures 50 and 51 show how to make head wraps and put them on. For turkey hens make the long side of the head wrap about 24 inches. For chickens it should be from 18 to 20 inches.

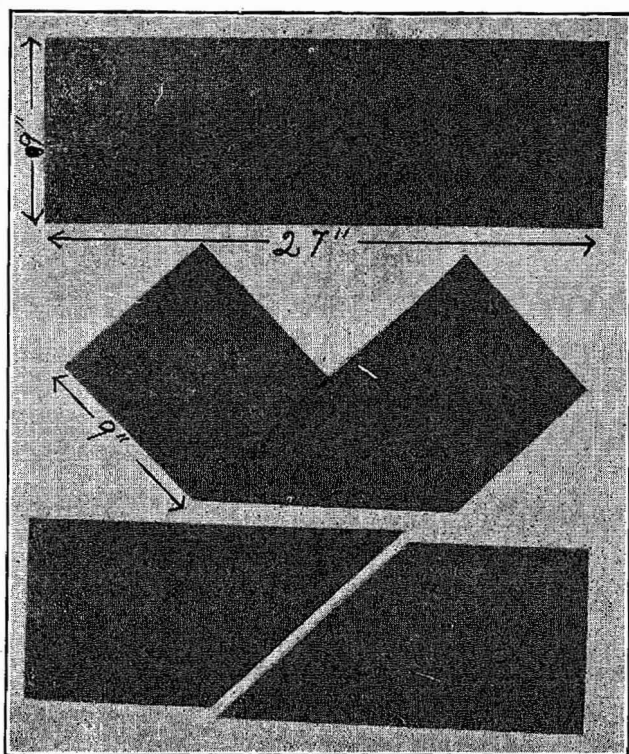


Figure 50. The size and shape of head-wrap used on dressed birds for market.

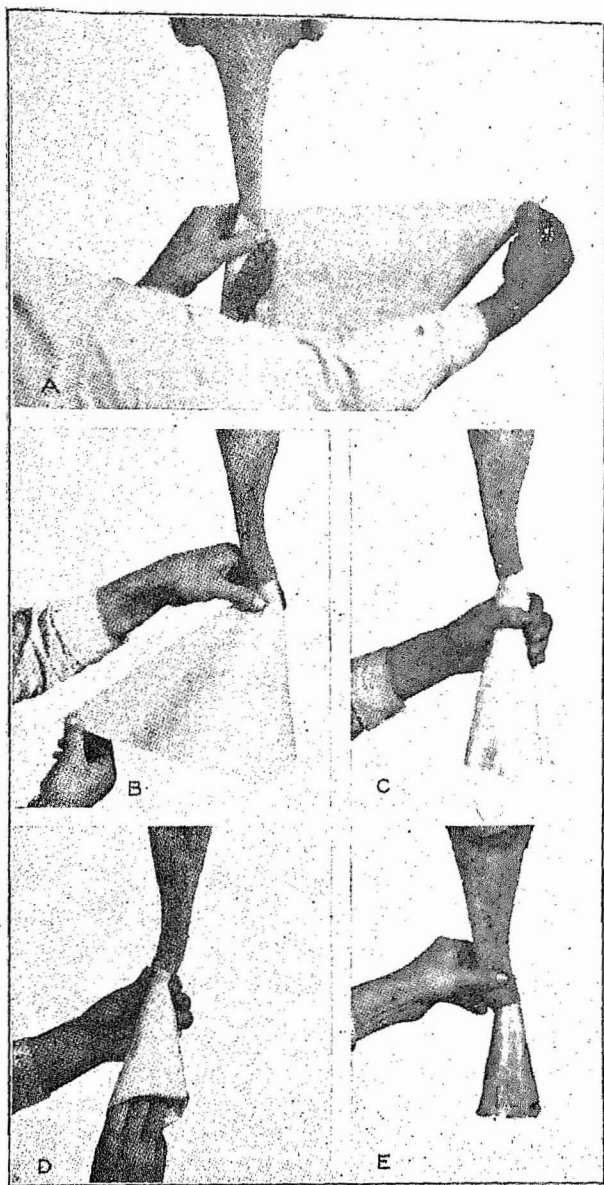


Figure 51. Wrapping the heads gives birds a better appearance on the market.

**Taking Dressed Birds to Market**—For cooperative pools or for wholesale market, birds are delivered dressed but not drawn. The heads and feet are **not** removed. Never take the birds to market until thoroughly cooled, or the skin will be scuffed and blemished. It is best to put straw in the bottom of the truck, covered with a "tarp". Place the birds carefully on the "tarp". Do not pile the birds too deeply. Never let the truck stand in the sun while waiting to deliver the birds.

### CLUB ACTIVITIES

Several activities may be undertaken to increase the interest in club work in connection with the dressing of poultry.

**Picking Contest**—A picking contest can attract quite a lot of attention. The contestants each take a live bird, kill it and completely pick it. The following score can be used in judging the contest.

Table 13—Picking Contest Score Card

Points Considered	Score
Time required to completely dress bird	50%
Appearance of dressed bird:	
Properly bled (18%)	
Complete removal of feathers (16%)	
Freedom from scuffing, tears and broken bones (16%)	50%
Total	100%

**Dressed Poultry Show**—A dressed poultry show has great educational value. Such a show should be put on only during cold months when the show room can be kept at a temperature of 36° or lower, unless chilled show cases can be rented.

The following score card may be used in connection with a dressed poultry show:

Table 14—Dressed Poultry Score Card

Name of Section	Remarks	Scale or Points	Score
Size	In accord with class in which exhibited	5	
Head	Compact with small, close fitting wattles and comb	5	
Body	Rectangular in shape. Compact and wide between the legs	15	
Wings	Small	3	
Back	Broad, medium in length, well fleshed	5	
Legs	Short, well fleshed	5	
Breast and Keel	Full, rounded, broad, well covered with flesh, keel bone straight	25	
Bone	Fine and small	2	
Skin	Soft and fine, clean, well picked free from blotches and bruises. Color, yellow or white according to variety	25	
Flesh	Not flabby, and not overfat, especially in the abdomen	10	
	Total	100	

**Obtaining a Federal Turkey Grader's License**—Practically all the turkeys in the state are sold on federal grade. The men who do this grading are all Montana residents. While graders have to know how to handle people as well as grade turkeys, it is not a bad job for a member taking poultry club work to learn. Every fall a federal grading school is held. Members who attend can learn how to grade. Then after working with a licensed grader for a

Table 15 — U. S. Grades for Dressed Turkeys

U. S. Grades	Quality Specifications for Individual Birds
U. S. Grade AA	<p>Young, fine grained, soft meated female bird, with broad full-fleshed breast extending well back to the rear of the bird, with the breast flat across the top rather than pointed. The entire carcass fully covered with fat. Must be fully bled, extra well dressed and free of pinfeathers. No flesh bruises allowed; and only very slight skin abrasions, bruises or discolorations permitted, none of which shall be on the breast. Slightly dented breast bone (not to exceed <math>\frac{1}{8}</math>-inch in depth) permitted but no crooked breast or other deformities allowed. No open tears or sewn skin permitted. A broken or disjointed wing, or a broken or disjointed leg not permitted. Must be dry picked or semi-scalded and must be dry packed.</p>
U. S. Grade A	<p>Young, soft meated female bird, with well-fleshed breast, and with entire carcass well covered with fat. Must be well bled, well dressed, and practically free of pinfeathers, especially on the breast. Only slight flesh or skin bruises, abrasions, or discolorations permitted, with breast practically free of such defects. Slightly dented breast bone (not to exceed <math>\frac{1}{4}</math>-inch) permitted. Slightly curved, but no crooked breast permitted. Must be free from deformities. Broken wings above the wing tips or broken legs not permitted. A disjointed leg or wing permitted if only slightly bruised. Bird with crop properly washed out or properly removed may be included in this grade. No torn skin permitted. No sewn skin permitted on the breast or fleshy part of the carcass, and only slight tears sewn, permitted on the back. Must be dry picked or semi-scalded.</p>



Table 15 — U. S. Grades for Dressed Turkeys — Continued

U. S. Grades	Quality Specifications for Individual Birds
U. S. Grade B	<p>Young female bird, with fairly well-fleshed breast, and with carcass fairly well covered with fat. Must be fairly well bled and dressed, and may show scattered pinfeathers over the entire carcass. Slight flesh or skin bruises permitted, but not more than three such defects if on the breast. Fairly numerous skin abrasions or discolorations permitted. Abrasions or tears over 3 inches in length, on the fleshy part of the carcass, not permitted unless properly sewn. Slight open tears less than 3 inches in length may be permitted if on the back or over the back of wings. Dented or slightly crooked breast bone or other slight deformities permitted. One broken wing or one broken leg permitted if bone does not protrude through the flesh and if not showing excessive bruise or blood clot.</p>
U. S. Grade C	<p>Young female bird which may be poorly fleshed and with carcass poorly covered with fat. May show evidence of poor bleeding and have numerous pinfeathers over the entire carcass. Numerous skin abrasions and discolorations permitted. Hunchback or other deformities allowed, if bird is fairly well fleshed. Open tears permitted in skin. Broken bones or bird badly bruised so as to make any appreciable part of the carcass inedible, not permitted. Bird showing emaciation or external evidence of disease or other condition which renders it unwholesome or unfit for human food not permitted.</p>

couple of shipments, they too may obtain a grader's license. But even if the member has no intention of getting a license, it is a good idea for a member to know the federal grades. Grades are based entirely upon fattening, fleshing, and the condition of the bird and have nothing to do with size. Size refers to class. Classes are packed separately. With turkeys there should not be more than 2 pounds difference between any two birds in a box. There should not be more than a pound difference between chickens or capons. Class also refers to sex and age. The U. S. Specifications given in table 15 are for Young Hen Turkeys. Other classes are similar except for allowance for fleshing conditions characteristic of sex and age.

**Demonstrations**—There are several demonstrations which members can give in connection with dressing poultry.

### 1. Killing and Slack Scalding

**Equipment necessary:** shackle for holding bird; killing knife; blood cup; bucket or drum to hold water; an accurate thermometer and watch.

**Points to be emphasized in demonstration**—The member should tell when slack scalding is necessary; why each piece of equipment is necessary; show each step in the operation and be sure to tell how to handle the product.

### 2. Trussing Birds and Preparing for the Freezer Locker—The member may or may not wish to have the bird drawn before giving the demonstration.

**Equipment**—A long, stout needle; about 1 yard of stout string and a sheet of cellophane or pliofilm.

**Points to be emphasized in the demonstration**—It is well to show how to remove the neck. Then each step in the trussing should be clearly demonstrated. Then the birds should be neatly wrapped.

### 3. Wrapping Heads—

**Equipment necessary:** a fully dressed bird; a yard stick; a sheet of heavy wrapping paper and a pair of scissors.

**Points to be emphasized**—The member should show how a head wrap is made and give the dimensions for various classes of poultry. Then the member will show each step in head wrapping. Considerable practice is necessary before putting on this demonstration, simple as it is, so that the head wrap will stay on and have a neat appearance.

## Chapter VII

## TURKEYS

All through the manual turkeys have been included in discussing other types of poultry. Therefore the member concerned with the growing of poults should consult Chapter II. If it is information about young turkeys on range that is required, the member turns to Chapter I on Growing Young Stock. For killing, dressing and marketing, Chapter VI is studied.

Nevertheless there are a few matters which refer primarily to turkeys. These are dealt with in this chapter.

**Kind of Turkey**—Since a greater percentage of top grade birds can be obtained from Broad Breasted Bronze turkeys than from any other variety with the same breed, it is wise to raise them. Also Broad Breasted Bronze mature earlier. They are not as good at rustling but they bear confinement better.

**Age of Birds for 1st Year Members**—As with chick projects, a turkey club member would do well to handle only growing stock the first year. When sure of himself, the poult phase of the work may be undertaken.

Unless one is well situated and has especially fine breeding stock, a member should not go into the breeding phase or hatch poults. Some of our biggest turkey growers in the state buy poults each year. They feel that they can have earlier poults from better stock by doing this.

**Feeding**—Turkeys grow faster than chickens. Although the size of the poult and chick is about the same, the turkey gains 18 to 20 pounds while the chicken is growing 4 or 5 pounds. Therefore the turkey needs more body building material in its ration. In other words the turkey needs a starting mash with 26% protein when a chick requires 20% protein. Also a turkey requires 18% to 20% in the growing mash against 15% required for the chick. For this reason suggestive starting and growing mashes are given:

**Turkey Starting Mash**

Ground wheat .....	20	lbs.
Mill run .....	10	"
Ground corn .....	20	"
Ground oats .....	10	"
Alfalfa leaf meal .....	5	
Meat scrap (50% protein) ..	20	
Dry skim milk .....	5	
Salt .....	1	
Cod liver oil .....	2	
Soybean oil meal .....	5	
Oyster shell .....	2	
Manganese sulphate .....	.012	
Total .....	100.012	

**Turkey Growing Mash**

Ground wheat .....	25	lbs.
Mill run .....	10	"
Ground corn .....	15	"
Ground oats .....	10	"
Ground barley .....	5	
Alfalfa leaf meal .....	5	
Meat scrap (50% protein) ..	7	
Dry skim milk .....	4	
Soybean oil meal .....	14	
Salt .....	1	
Cod liver oil .....	1	
Oyster shell .....	2	
Bone meal .....	1	
Manganese sulphate .....	.012	
Total .....	100.012	

**Young Stock Range**—In chapter I emphasis is laid upon having a clean range. This is doubly true for turkeys. Turkeys should never be brooded with chickens. Chickens may be carriers of blackhead, yet show no signs of the disease. Pheasants also carry blackhead. Therefore never use straw from stacks where pheasants have roosted. At the first sign of blackhead move the turkeys to clean range. Move them again the next day and the next. After a week of moving there should be no further danger. At the same time add 2% powdered tobacco dust or 0.5% nicotine sulphate powder to their mash and feed for 2 days. On the third day put one pound of epsom salts in 5 gallons of drinking water.

Symptoms of blackhead are droopiness, loss of appetite, loss of weight and frequently sulphur-colored droppings. On post mortem examination, the turkeys with blackhead, the caeca (the blind guts) are filled with cheesy material and livers have greyish green depressed spots.

## CLUB ACTIVITIES

As in all other 4-H Clubs, the members may add many interesting activities to their program besides the actual project work. All of these activities help the member to learn more about the subject matter of his project, help to have a more interesting year and make him a better citizen, since many of the activities will directly or indirectly help others.

**Tours**—For a tour the member is referred to the tour under Club Activities in Chapter I.

**Exhibits**—Again the member is referred to the paragraphs on exhibiting under Club Activities in Chapter I. If Broad Breasted Bronze turkeys are being shown, it will be difficult to find a bird which conforms to "The American Standard of Perfection." Judges will look for body conformation rather than standard feather characteristics.

**Judging Contests**—Since it may be hard for members to collect a class of turkey for a judging contest and since all members in poultry clubs should know something about chickens, it is advised that turkey club members enter the regular poultry judging contest. For information about this contest the members are referred to Chapter IV.

**Other Contests**—A turkey picking contest may be given. See Chapter VI.

### **Demonstrations—**

1. **Killing and Picking**—See Chapter VI.
2. **Making Pieces of Equipment**—See Chapter I.
3. **Treating Birds for Internal and External Parasites**—See Chapter VIII.

## Chapter VIII

## POULTRY DISEASES AND PARASITES

The diseases most likely to appear in baby chicks, growing stock, laying hens and turkeys have been mentioned. To help in the diagnosis of these diseases a chart has been prepared. But before giving this, a word might be said about all sick birds. **Get rid of them.** It does not pay to doctor sick birds. Either bury or burn them. Sanitation is the best disease weapon.

**Keep:**

1. A clean house by disinfecting it with a good spray or scrubbing with hot lye water.
2. A clean yard by moving the house to clean ground or scraping off the top two inches of contaminated soil and putting on a top layer of fresh sand or gravel.
3. Clean water and feed by keeping feeders and water fountains elevated. Do not put dope in the water unless birds are sick. Then use sodium hypochlorite solution, B. K. Solution, Chlorox and similar solutions containing sodium hypochlorite. Wash water fountains daily and disinfect weekly. Use feeders and fountains which birds cannot roost or walk in.
4. Clean birds by keeping only pullorum tested birds and whenever possible get birds from paralysis free stock.

### Diagnosis Chart

Disease or Trouble	Symptoms	Cause	Treatment	Prevention
Aspergillosis (in brooder chicks)	Alive—Dumpy and	Mouldy litter or feed	None	Remove cause and keep house clean and dry.
Bacillary White Diarrhea Pullorum Disease	Alive—Dumpy and sleepy get the disease within first 10 days, diarrhea, feathers rough Dead—Liver often yellow streaked, only microscopic examination	Chicks from infected eggs or contact with infected chicks.	No cure, but chicks helped by milk diet, dry, warm brooder.	Test hens and remove reactors.
Bloody spots in eggs	Bloody spots seen in candling	Lack of green feed or cod liver oil, too much animal feeds, fright or over-production.	Give 2% cod liver oil and cut down meat scraps	Never force production.
Bronchitis	Rattling in throat, difficult breathing	Drafty or over crowded quarters.	Keep warm, relieve with an inhalant such as eucalyptus oil on oiling water.	Correct housing
Bumble foot	Swollen pad of foot, temperature in foot.	Jumping onto hard floor, pus in the injury.	Poultice foot or paint with iodine to bring to a head, lance, remove core, wash with iodine or B-K.	Provide clean litter.

# DIAGNOSIS CHART (Continued)

Disease or Trouble	Symptoms	Cause	Treatment	Prevention
Canker	Cheesy material in the mouth.	Injuries from fighting or bearded grains or colds.	Remove material from mouth with cotton swab dipped in disinfectant.	Treat injuries before canker sets in.
Coccidiosis (appears from 4 weeks to 2 months)	<b>Alive</b> —Bloody droppings, dumpy, rough feathers. <b>Dead</b> —Inflamed intestines, cheesy material in blind intestines, must be confirmed by microscopic examination.	Coccidia in contaminated soil may live in soil 5 years.	Kill sick birds, put on 40% milk diet for 10 days, keep brooder house warm. Clean brooder house daily and add ½ lb. Sulphaguanidine to 100 lbs. of mash. Feed for 3 days to 1 week.	Brood on clean soil, in clean, dry house.
Colds (Chicks and adults)	Dust sticking to the nostrils, sneezing, tears in the eyes, feathers ruffled	Drafty houses, overcrowding, faulty feeding (also in chicks chilling or overheating) constipation and lack of green feed.	Treat at once, otherwise roup, bronchitis, pneumonia or diphtheria may develop. Isolate sick birds, correct feeding, disinfect feeding or water pans; give well birds dose of epsom salts (1 lb. to 100 birds).	Keep clean, dry, well ventilated house, feed plenty of green feed.

DIAGNOSIS CHART (Continued)

Disease or Trouble	Symptoms	Cause	Treatment	Prevention
Comb frozen	Swollen, darkened comb	Damp, cold house	Rub carefully with fingers smeared with vaseline, keep in cool place, anoint twice daily with ointment: 5 tablespoonsful vaseline, 2 tbsp. glycerin, 1 tbsp. turpentine	Keep house well ventilated.
Constipation	Droppings too hard, loss of appetite, difficulty in laying eggs, extreme cases lose use of legs.	Not enough green feed	1 pound of epsom salts to 100 adult birds	Plenty of water and green feed.
Crop bound	Crop hard and sticking out.	Stoppage below crop or too much fiber, such as wheat stalks.	Massage the crop, give sweet oil or castor oil. Severe cases—open and remove material.	Don't feed too much fibrous feed.
Crop pendulous	Crop filled with vile smelling liquid	Spoiled feed or undigested feed.	Empty crop, wash, give castor oil.	Give clean feed, prevent constipation.
Depluming Mite	Feathers broken off, skin bare.	Mite living at the feather ends.	Rub carbolated vaseline thoroughly into skin.	Clean house and clean hens.
Dropsy	Hens walking like a duck, abdomen filled with liquid.	Not known	None.	None



### DIAGNOSIS CHART (Continued)

Disease or Trouble	Symptoms	Cause	Treatment	Prevention
Jaundice	Yellow combs and wattles	Continued congestion of the liver from wrong feeding, especially green feed.	Give epsom salts, followed by plentiful supply of green feed daily	Never allow the flock to go without green feed.
Lice	Ruffled feathers, feather picking.	Body louse, lice eggs found on feather shafts on fluff feathers below the vent.	(1) Sodium Fluoride by pinch method, pinch in fluff feathers, one under each wing, back of head and along the back. (2) "Black Leaf 40" painted in thin line down the roost $\frac{1}{2}$ hour before birds go to roost.	Never allow lice to get a start.
Limberneck or Botulism	Bird loses control of neck and leg muscles	Spoiled feed or dead meat, or poisoning or constipation.	<b>Individual treatment.</b> 1 tsp. castor oil at once. Put in a warm place by itself. Give only warm, sweet milk until better. <b>Flock treatment—</b> for fear others got the same feed give epsom salts 1 lb. to 100 birds.	Keep poultry yard free from dead birds and animals. Feed only clean feeds. Avoid constipation.

# DIAGNOSIS CHART (Continued)

Disease or Trouble	Symptoms	Cause	Treatment	Prevention
Mites	Very thin birds, pale, often walking unsteadily because of loss of blood.	A mite that lives in cracks during the day and looks like grey dust. Feeds on the birds at night then looks red as it is filled with the birds' blood	Take all movable fixtures out of poultry house and scrub with hot lye water. Brush all dust and dirt out of cracks. Then paint or spray with waste crank case oil.	Never allow mites to get a start in the house.
Nutritional Roup	<b>Alive</b> —Occurs in both young and old birds, swollen head, cheesy material in eyes, white patches in throat membrane. Chicks eyes stuck together, paralysis. <b>Dead</b> —Kidneys sparkle and are swollen.	Lack of green feed or in very small chicks lack of green feed in the mother's diet.	Add 1 to 2% cod liver oil to the diet, either in mash or coat the grain. Mix only the amount to be used each day, or plenty of good alfalfa or carrots.	Avoid lack of Vitamin A.
Paralysis	<b>Alive</b> —Paralysis of leg or wing. Grey eye or blind. <b>Dead</b> —Tumors, big livers.	Apparently transmitted through the egg.	None	Get birds from paralysis free stock.
Perosis or Slipped tendon	<b>Alive</b> —Hock joints become puffy, then bowed, then tendons slip out of place.	Lack of Manganese in diet or too much calcium or phosphorous	Add ¼ lb. Manganese Sulphate to 100 lbs. of salt. Mix this with 1 ton of mash.	Keep .012% Manganese Sulphate in all mashes.
Roundworms	<b>Alive</b> —Lameness, blindness, diarrhea, ruffled feathers. <b>Dead</b> —Long, white, round worms in the small intestines.	Worm eggs picked up from contaminated ground or feed. Worm eggs live in soil for years	Reliable roundworm eradicator pills or capsules or 2 lbs. of tobacco dust in 100 lbs. of mash. Feed daily for three weeks.	Keep poultry on clean yards.

DIAGNOSIS CHART (Continued)

Disease or Trouble	Symptoms	Cause	Treatment	Prevention
Roup	Swollen eyes and face, nostrils clogged, hackle feathers soiled, disagreeable odor.	A cold that is allowed to run. Overcrowding, drafty houses, bringing home birds from shows that have been exposed to roup.	Destroy sick birds. Correct conditions. Disinfect house, feeding and water dishes. Give all well birds epsom salts 1 lb. to 100 birds. Give correct diet.	Keep house clean, dry and well ventilated. Never put a strange bird in a flock until it has been quarantined for 10 days.
Rickets or "Leg weakness"	Leg weakness, birds down on their hock joints and can't walk.	Lack of sunshine, lack of Vitamin D.	Give 1 to 2% cod liver oil, give plenty of green feed, get birds out into the sunshine on a green yard.	Supply birds with Vitamin D and direct sunlight.
"Scaly leg"	Scales on legs, raised with crusty material under the scales.	Scaly leg mites living up under the scales on the legs.	(1) Soak in warm soapy water; brush out crusty material with stiff brush, rub in carbolated vaseline or an ointment made of lard and kerosene oil. (2) Place a pan of kerosene where the birds have to wade through it to go in and out of the poultry house.	Keep house clean, never keep scaly legged birds.

DIAGNOSIS CHART (Continued)

Disease or Trouble	Symptoms	Cause	Treatment	Prevention
Tapeworms	<b>Alive</b> —Thin, lame, ruffled feathers, diarrhea. <b>Dead</b> —Segmented, flat worms in upper part of intestines, highly inflamed intestinal wall.	Tapeworms acquired from flies, angle worms or beetles that have previously eaten tapeworm eggs.	For adults—one 15-grain capsule or tablet of kamala. Growing chicks—1 lb. or less, $\frac{1}{4}$ to $\frac{1}{2}$ dose, depending on size of bird.	Screen against flies and raise on wire floor if tapeworms are present.
Tuberculosis	<b>Alive</b> —Very thin, lame, diarrhea, ruffled feathers. <b>Dead</b> —Yellowish spots on liver and spleen. Nodules or bumpy places on the intestines.	Germ— <i>Bacillus tuberculosis</i> . The germ in droppings from infected birds is picked up by well birds.	None—kill and burn all infected birds. Disinfect poultry house thoroughly, move to clean ground or scrape off top dirt around poultry house. Raise chicks artificially.	Keep house clean and well ventilated. Never borrow broody hens from unknown flocks.