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# -H POULTRY

ARIZONA



Circular 190

Agricultural Extension Service  
University of Arizona, Tucson

## Remember . . .

The success of your poultry project depends upon several things. One is the extent to which you apply the recommended practices of poultry raising. Another is the extent that your parents, club leader and County Agricultural or Home Demonstration Agent guide you.

This manual is intended for use of 4-H Club members, parents, leaders, and County Agricultural and Home Demonstration Agents in the development of 4-H Poultry projects. It gives you some of the most important principles for a successful poultry enterprise.

Use this manual to provide the necessary information on poultry raising. By so doing, you will have the experience and the fundamental practices for future use in the operation of a successful poultry farm.

Take good care of this manual, for you will need it over a period of years. It is your guide and reference. Be careful not to lose or damage it. Keep it in some special place so you will always have it when you need it. Write your name and address below.

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(Your Name)

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University of Arizona  
College of Agriculture, Agricultural Extension Service  
Chas U Pickrell, Director  
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10M—July 1951—Circular 190

# 4-H

## POULTRY

In Arizona



*By* W. R. VAN SANT

Extension Poultryman

### It's Fun to Raise Poultry!

You can have fun and earn money, too. Four-H poultry club work is organized so that you may become more familiar with poultry practices. The best way to learn about poultry raising is to work with poultry.

### You Will Learn

As a poultry-club member, you will gain experience and knowledge in raising baby chicks, taking care of laying and breeding flocks, and marketing poultry and poultry products. You will learn by doing, with the help of your club leader, parents, and other poultrymen.

Poultry production affects more people than any other agricultural activity. Poultry lends itself well to 4-H Club work. It is both easy and inexpensive to start in this business.

### Projects Are Practical

Poultry projects are practical and economical for farm boys and girls because:

1. Only a small amount of cash is necessary to begin.
2. There is a quick turnover of money invested.



### ▲ THIS MAY LEAD TO THIS ▲

Plan your 4-H poultry project over a period of years, and develop a family flock of 25 birds, a farm flock of 300 to 500 birds, or a commercial flock of 2,000 birds or more.

3. Poultry projects provide a cash income all months of the year.

6. They bring opportunity for individual and team competition.

4. Many phases of the poultry project make it possible to have a wide range in the selection of demonstrations.

7. They provide an opportunity to win state and out-of-state trips and awards.

5. Poultry projects provide an opportunity to study selection, management, feeding, marketing, showing and judging of poultry and poultry products.

As your poultry projects develop, you will learn about the importance of the poultry industry in your community, county, and state. Many 4-H club members build commercial poultry enterprises from their first poultry projects.

# Your Poultry Project Requirements

To receive a 4-H certificate for a poultry project at the end of the club year, you must meet the following requirements:

1. Be between 10 and 21 years of age.
2. Own and do your own work on one or more of the following projects:
  - a. Broilers or fryers.
  - b. Growing better pullets.
  - c. Laying flocks.
3. Keep a record of expenses and receipts.
4. Turn in the record to your County Agricultural or Home Demonstration Agent at the end of the year's work.
5. Use a standard breed and variety if you plan to exhibit. (With the exception of fryers and roasters.)
6. Follow your leader's instructions and attend club meetings.
7. Enter exhibits at fairs and shows whenever possible.
8. Study available material on poultry.
9. Work with your County Agricultural or Home Demonstration Agent.
10. Attend local and county 4-H programs.

## Develop All Three Phases

As a 4-H club member you may divide your poultry project work into three phases — fryer, pullets, and laying flock. Each phase will count as a complete project. However, as a poultry-club member, you should develop all three phases in order to have a complete program.

By carrying out all three phases of the poultry program, you can get greater returns and have more efficient use of your equipment. Plan to develop your poultry project into a family flock of 25 birds, a farm flock of 300 to 500 birds, or a commercial flock of 2,000 birds or more.

## Requirements for Broiler, Fryer Project

The broiler or fryer production project is usually started between September 1 and October 30 for fall broilers, and January 1 to March 31 for spring broilers. It should be completed in three or four months.

The purpose of the broiler project is for you to get practical experience in raising and marketing broilers and fryers to increase your cash income. Also, you can utilize your equipment to raise pullets for flock replacement.

In order to have a successful broiler or fryer project you should:

1. Raise 100 or more broilers or fryers.

2. Use only heavy breeds such as New Hampshires, Rhode Island Reds, Barred Rocks, and White Rocks.

3. Market 2½-pound broilers at 9 to 10 weeks of age, and 3-pound fryers by 12 weeks of age.

4. Keep an accurate record of all expenses and receipts and give a copy to your County Agricultural or Home Demonstration Agent when broilers are marketed.

### **Requirements for Growing Better Pullets**

One setting hen and 15 eggs are **not** enough to make a worthwhile 4-H poultry project.

Take over your home flock of chickens and manage it as a 4-H poultry club project. The pullet project lasts about 6 months and should begin not later than April 15.

In order to have a successful pullet project you should:

1. Start chicks during January, February, March, or April.

2. Start 3 straight-run baby chicks for each mature pullet to be housed in the fall. One hundred baby chicks should give you 25 to 30 good pullets for the laying flock.

3. Follow a good summer-management program.

a. Provide open range for pullets separate from old hens.

b. Provide green feed.

c. Keep pullets on growing mash.

d. Supply plenty of fresh water.

e. Provide natural or artificial shade.

4. House pullets in a clean building by September 1.

5. Vaccinate growing pullets for chicken pox, preferably in May or June.

6. Sell or eat all cockerels by the time they are 15 weeks old.

7. Keep accurate records and give a copy to your County Agricultural or Home Demonstration Agent.

### **Requirements for A Laying Flock**

If you are to get a high labor income from your laying flock project, it is essential to obtain a high average egg production at a low cost per dozen. The laying flock project lasts for one year. It begins about September 1, and ends the following August with the sale of old hens.

The laying flock is the most desirable poultry project for the beginning 4-H club member.

● Less care is necessary for a laying flock than for baby chicks or pullets.

● The laying flock requires less daily labor on your part.

● It provides greater opportunity for you to take complete charge of the project.

● There is less risk involved in the loss of birds.

● It provides immediate income.

For a laying flock carried as a 4-H poultry project, you should meet the following requirements for a successful enterprise:

1. Develop an all-pullet flock of 25 to 30 birds by September 1 for a farm family flock; 300 to 500 birds for a farm flock; and 2,000 and up for a commercial flock.

2. Sell all old hens in August.

3. Provide proper housing, nests, feeders, roosts, runs, and other needed equipment.

4. Provide for proper feeding and management practices.

5. Keep accurate records of production, feed, costs, sales, death losses, etc., and give a copy to your County Agricultural or Home Demonstration Agent.

## Selecting a Breed and Variety

Keep only one breed and one variety of the breed you choose. Club members often want some different breed than that already on the home farm. This is not practical in most cases, and the desire has caused many good farm poultry flocks to be neglected.

Make a thorough study of the breed and variety of the home flock. If the study proves the breed now on the farm to be impractical, choose another after careful study of other breeds and varieties.

Do not add the new breed and variety selected. Replace the old breed with the new.

### Best Breed

"Which is the best breed of chicken?" This question is frequently asked by 4-H poultry club members and others. The answer is, "There is no 'best' breed."

But breeding within a breed and variety for a specific purpose, such as eggs or meat, is important in selection. Personal preference for certain color, body shape, or size of fowl is not a sufficient reason

for making a selection of breed and variety.

Study the merits of the different breeds and varieties for the purpose which they are used. Select one that will serve your purposes best.

### Most Popular

There are several breeds and varieties of chickens. The most popular in Arizona are White Leghorns, New Hampshires, Rhode Island Reds, Barred Plymouth Rocks and White Plymouth Rocks.

If the main object of the project is egg production, the White Leghorn is the most suitable. For broilers or fryers, the meat strain of the New Hampshire is in greatest demand. For eggs and meat, the Rhode Island Red is a very popular breed. Also, the egg strain of New Hampshires is in demand for eggs.

Remember, the breeding background of the baby chicks purchased is very important in your selection for the purpose that you intend to use the birds.

(See Extension Circular 159, "4-H Poultry Judging and Exhibiting.")





### U. S. CERTIFIED N. P. I. P. LABEL U. S. PULLORUM CLEANED

These emblems identify breeding flocks, hatching eggs, and baby chicks produced under official supervision in a constructive breeding and pullorum disease-control program.

## Buying Baby Chicks

### Get the Best

Buying day-old chicks is generally the cheapest and most satisfactory way to start your project. In deciding what and where to buy, the most important consideration is quality. The price is the least important matter of all. Today the poultry raiser can afford none but the very best of stock.

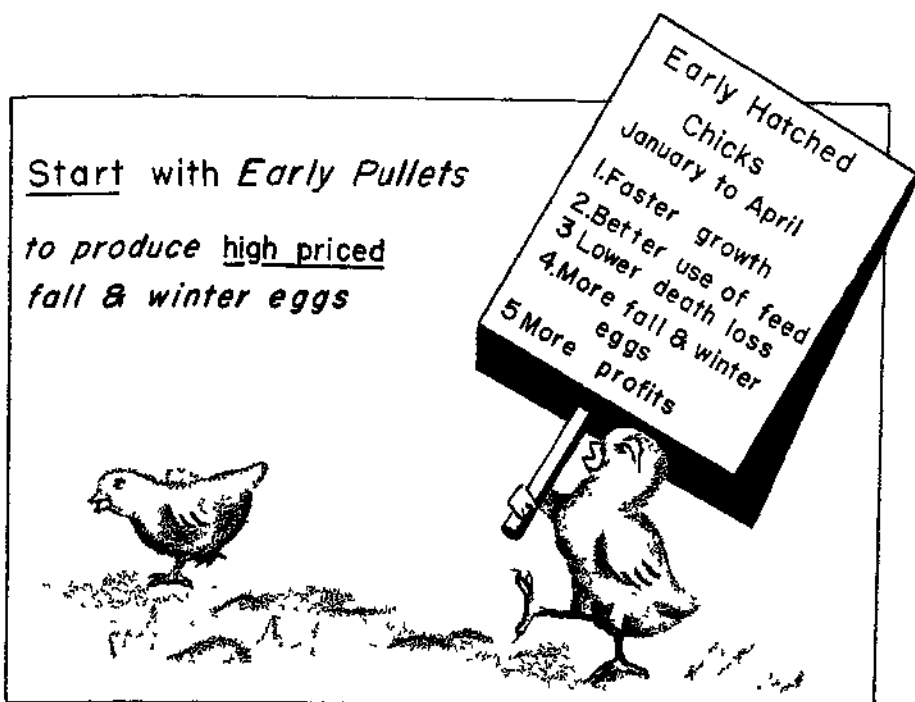
Insist upon officially pullorum-clean or pullorum-passed chicks. These chicks are from flocks which have been officially tested and found free from pullorum disease. Do not confuse such terms as "pullorum - tested," "accredited," and the like with "Pullorum-passed" and "Pullorum clean."

Also, insist upon a defined breeding stage, "U. S. Certified" or "U. S. Approved." "Arizona U. S. Certified — Pullorum Clean" would be the best grade to purchase for laying purposes.

A list of hatcheries participating in the Arizona Poultry Improvement Program is available at your County Agricultural Agent's office.

### Hints on Buying

- Select the breed that suits your purpose.



Get your chicks early.

- Order early so that you can expect delivery when you want the chicks.

- Get chicks in early spring, January to April.

- Buy from a strain that has proved to be of good quality and high egg production.

- Buy only from hatcheries following a good selecting and blood-testing program.

- If possible, buy from a nearby hatcheryman so that you can look over his birds.

- Do not buy chicks at bargain prices. Good chicks will cost you more but your money will be well invested.

## Early Hatched Chicks

January, February, March are important months in planning successful 4-H poultry projects. It is during these months that the foundation is laid for fall and winter egg production.

Chicks hatched in February and March should be mature and laying by the middle of August. Late-hatched chicks may lay as many eggs as early-hatched chicks, but most of these eggs will be produced in the season of low egg prices.

## How Many Chicks?

Start 3 early-hatched chicks for every pullet that you expect to house in the fall.

Allow for death losses and culling. On the average, 1 good pullet will be raised to  $2\frac{1}{2}$  to 3 straight-run chicks or  $1\frac{1}{2}$  sexed chicks started.

Sexed chicks are baby chicks

with the cockerels removed when they are 1 day old. Sexed chicks usually cost twice as much as straight-run chicks. It is best to purchase sexed chicks when brooder space is limited or if you are buying such breeds as Leghorns.

## All-Pullet Flock

An all-pullet flock consists of females under one year of age. All-pullet flocks can be secured by starting with baby chicks early in the season.

Grow pullets to maturity so that by the first of August all old hens can be sold and the entire flock replaced by early-hatched pullets. All-pullet flocks are more profitable than flocks of mixed hens and pullets.

- Pullets produce an average of 50 more eggs per bird per year than old hens. Four dozen fall and winter eggs per hen is your profit in a flock of chickens.

- A heavy hen usually sells for the cost of producing the pullet.

- Hens usually molt during the season of high egg prices.

- Early-hatched pullets lay heavily through the season of high egg prices.

## Brooding Baby Chicks

Careful management, especially during the first three weeks, is necessary to give baby chicks a good start in life. It takes more than just heat, feed, and water to raise chicks successfully.

The right amount of heat, controlled ventilation, correct feeding methods, strict sanitation, and regular care are important.

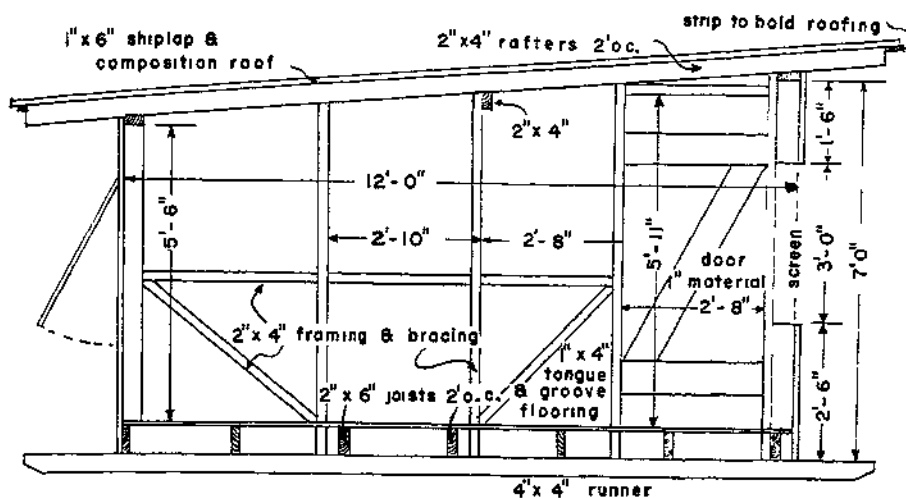
### Brooder House

A good brooder house is essential in raising chicks.

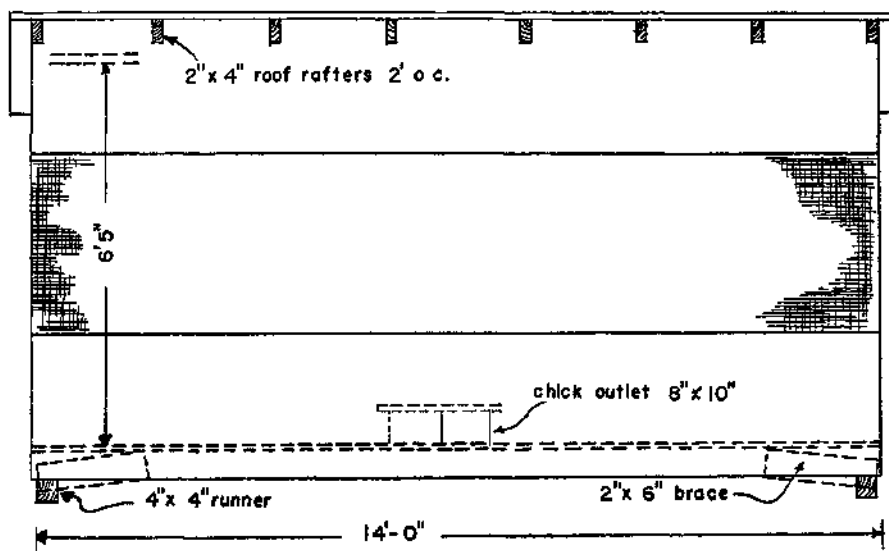
It is not always necessary to build a new brooder house, because

almost any small house or a part of the laying house can be remodeled to suit the purpose. However, if you need a new brooder house, the plans shown on Page 11 are satisfactory.

This house can be used as a brooder house to brood 100 to 250 baby chicks and will provide a laying house for 30 to 40 laying hens. Two brooder houses can be used to brood 500 sexed pullets to provide a farm commercial laying flock of 300 to 500 laying hens.



Here is a cross-section drawing of a brooder house on runners.



This is the front view of the brooder house on runners.



This brooder house is used in the lower-elevation counties of Arizona. It can be used in the higher-elevation counties if the walls and ceilings are insulated.

### Floor Space Requirements

The minimum floor space requirements for different ages of chicks are as follows:

Age of Chicken	Floor space per chick
1- 4 weeks	$\frac{1}{2}$ sq. ft.
4- 8 weeks	1 sq. ft.
8-12 weeks	$1\frac{1}{2}$ sq. ft.

### Easy to Clean

Build the brooder house of material to permit thorough cleaning and treatment for the control of disease and parasites. Galvanized iron, aluminum sheeting, wood, and certain types of composition materials are satisfactory.

Insulation will be necessary in the higher altitudes to prevent sweating during the cold weather. All lumber used should be treated

with a wood preservative to control parasite infestation.

The front of the house should be designed to give ventilation without drafts, and at the same time offer necessary protection from cold.

### Brooder Stoves

The purpose of the brooder stove is to furnish heat. There are many types of brooders on the market. Heat may be supplied by oil, gas, or electricity. Be sure and follow manufacturer's instructions in the operation of any brooder stove.

Many poultrymen like an oil brooder, although it may be more expensive to operate when oil



The brooder in operation above shows proper placement of equipment. Be sure to read and follow manufacturer's instructions carefully. You will need to make adjustments according to weather conditions.

prices are high. Take care that the burner is kept clean and oil lines do not become plugged.

The gas brooder has become more popular in recent years with the use of "bottled" gas. Fuel does not have to be carried into the brooder house. If you use this type, order additional supply tanks before the one in use becomes empty.

The electric brooder is very satisfactory in well-built, insulated houses. Most of the heat is confined under the hover where the heating unit is located. This brooder, often called a "cold brooder," gives the best results when used in the spring after the coldest weather is over.

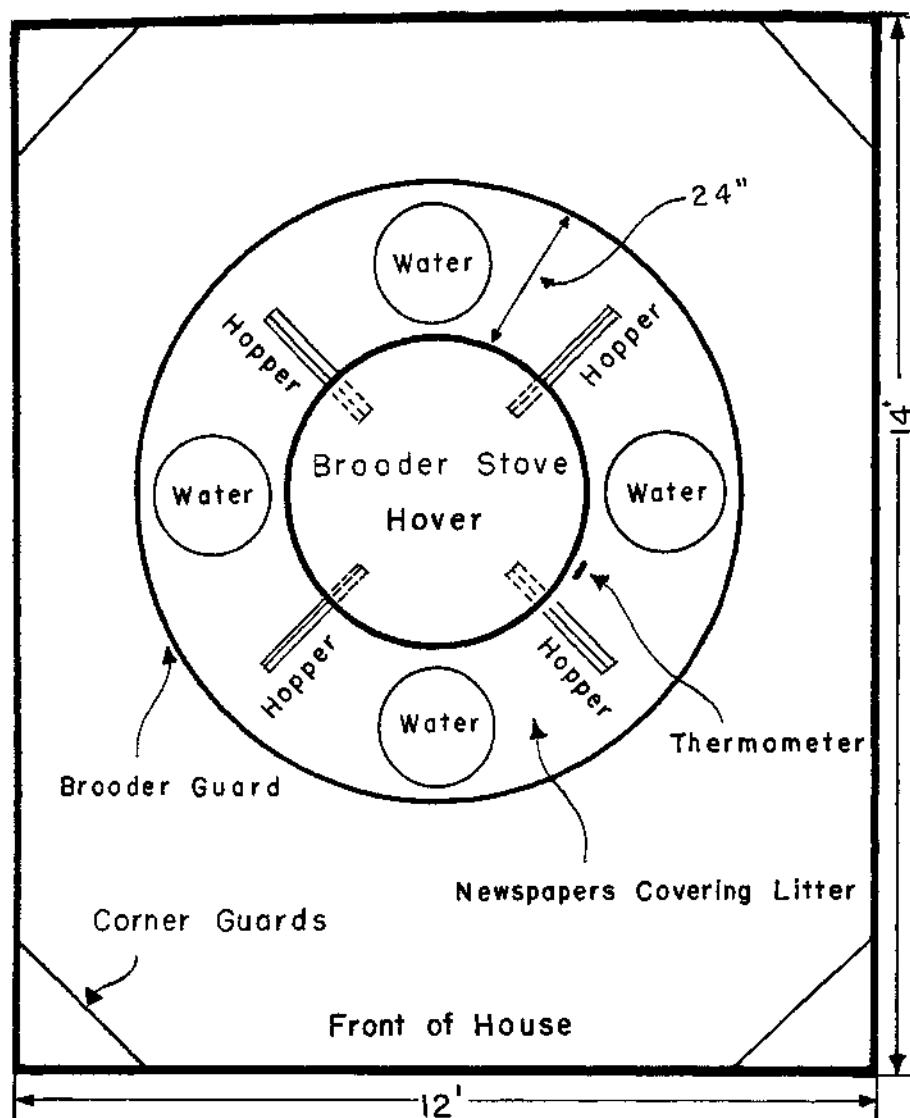
### You Can Build One

If you do not have a brooder, you can build a satisfactory electric brooder at low cost for use during March and April. Many 4-H club members have built brooders for 100 to 250 chicks, using either electric light or heat bulbs, or a commercial unit for heat. Either type should have an automatic heat regulator.

Plans for home-made electric brooders may be obtained from your County Agricultural Agent.

When building a home-made brooder, construct one that will:

1. Supply sufficient heat.
2. Not over-heat the chicks.
3. Not over-crowd the chicks.



This floor plan of a brooder house shows proper arrangement of equipment. Be sure to get the brooder house all ready for the arrival of your baby chicks.

Remember that chicks grow, but ventilation.  
the brooder stove does not.

5. Prevent fires.

4. Provide the chicks plenty of

## Litter

Many kinds of litter are used in brooder houses. Litter should be sweet and clean; not dusty. It should be light in color and of good absorbent quality. Straw, shavings, peat moss, and sand are all satisfactory.

Clean, dry sand is excellent to use as a litter. However, more care is necessary in the proper feeding to avoid overeating of sand. This can be accomplished by having plenty of feeders kept almost full. Or use egg case flats over the sand as feeders for a few days.

Do not put straw, shavings, etc., directly under the brooder because this makes a fire hazard.

## Chick Guard

When chicks are started under a brooder, some may run about the house, especially at night, and not return to the brooder. They become chilled and die.

To prevent the chicks from leaving the brooder, and also to keep them confined near and under the hover, surround the brooder with a guard or fence about 10 to 12 inches high. This also keeps drafts from blowing across the floor onto the chicks.

Any material that will stand up is satisfactory as a guard. Card-board that can be rolled, or roofing paper is good. Wire is not satisfactory as it does not stop drafts and chicks sometimes get through or get caught and injured by it.

Place the guard around the hover when the chicks are first put in. This should form a circle 18 to 24 inches from the edge of the brooder canopy, depending on outside temperature. Move the guard back every day or two.

The guard may be removed at the end of from 8 to 12 days. But keep it ready for emergency use at any time.

Be on hand the first few nights after the guard is removed, just at the time the chicks are settling down, to be sure they all go to rest around the hover and do not scatter to other parts of the pen.

## Prevent Crowding

Chickens do unexpected things. One that results in chick loss is crowding or piling in the corners of the pen. No one knows for sure why chicks crowd.

Too much heat will cause it, and not enough heat will do it. Fright, too, is almost sure to cause the chicks to rush to corners, resulting in trampling and smothering. Sometimes drafts or poor ventilation is the cause.

The way light is used or the amount of light used may send chicks to corners. An electric light (10 watts) in the house all night helps keep the chicks contented.

For safety, round all corners in the brooder house with wire or some material. Don't have any corners for the chicks to pile in. Piling straw in the corners will do the job satisfactorily and economically.





Many types of waterers are available. Above are shown one-quart to three-gallon sizes. The one-gallon, three-gallon and two-gallon containers with wire guards are the most popular.

## Give Plenty of Water

Chicks can't step to the fountain and get a drink as you do. They must depend upon you to give it to them. Water is as important to chicks as is other feed. Be sure to give them fresh water each day as often as needed.

A chick requires twice as much water as other feed. Water is the cheapest food and one that is often neglected.

The two-piece fountain is satisfactory and easy to use and clean. Start with a 1-gallon waterer for each 50 chicks. When chicks are two weeks old, the larger size two-piece waterer may replace the 1-gallon size.

Larger waterers may be of 3 to 5 gallon capacity. If kept filled, these will serve until the birds are moved to range where larger drinkers are used.

If the water containers are placed on wire platforms after the first week, the water will keep cleaner and the floors will be drier. Spilled water goes through the wire and is confined to the litter under the wire. This wet litter should be removed.

## Outside Runs

Outside runs are used by some poultrymen in mild weather after the chicks are 2 to 3 weeks old. These are constructed of small poultry wire attached to the brooder house. They are used for brooding or rearing in semi-confinement.

The chickens usually are kept confined in these houses and yards through the brooding period and until they are 8 to 12 weeks old. Pullets that are to be raised for flock replacement are then transferred to a clean range away from adult birds.

## Feeding Baby Chicks

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

Each baby chick needs 1 lineal inch of feeding space for the first 8 days of its life. Provide 1 hopper 2 feet long and 4 inches wide for each 50 baby chicks. Putting the

first feed in a hopper teaches the chicks always to eat from the hopper.

### **Place Hoppers Around Hover**

At the start, place the hoppers around the hover like the spokes of a wheel so that half of each hopper is under the brooder canopy and the other half is on the outside. Chicks seem to eat more readily for the first few days or for a week when the hoppers are placed this way.

Set each hopper on top of the litter for the first 3 days. After 5 days place the hopper on a stand 2 inches high.

After chicks are 5 weeks old, use the intermediate hopper, 34 inches long and 6 inches wide. Provide 2 feeders of this size for each 50 chicks.

### **Change Hoppers Gradually**

At first, place only one intermediate hopper in the pen with some of the original chick-size hoppers. Then gradually change to all intermediate hoppers.

The well-balanced commercial feed mixtures contain all the needed nutrients, vitamins, and minerals that the chick requires. They can be purchased easily and are ready to use.

### **Chick Feed Needs**

You will need 5 pounds of starting mash for each chick. This is the average amount needed to grow a chick for 8 weeks.

You will need 6 pounds of growing mash for Leghorns, and from 7 to 8 pounds for the heavier

breeds to grow each bird or pullet. Keep feeding this until the chicks are ready for laying mash.

You will need 13 pounds of scratch grain for each Leghorn and 16 pounds for each heavy breed.

Feed mash from the start, and begin feeding cracked scratch grain when the chicks are 6 weeks old.

### **Provide Grit**

One pound of grit is enough for 100 chicks for 2 weeks. It should be a hard calcite or granite grit and bright in color to attract the chicks' attention.

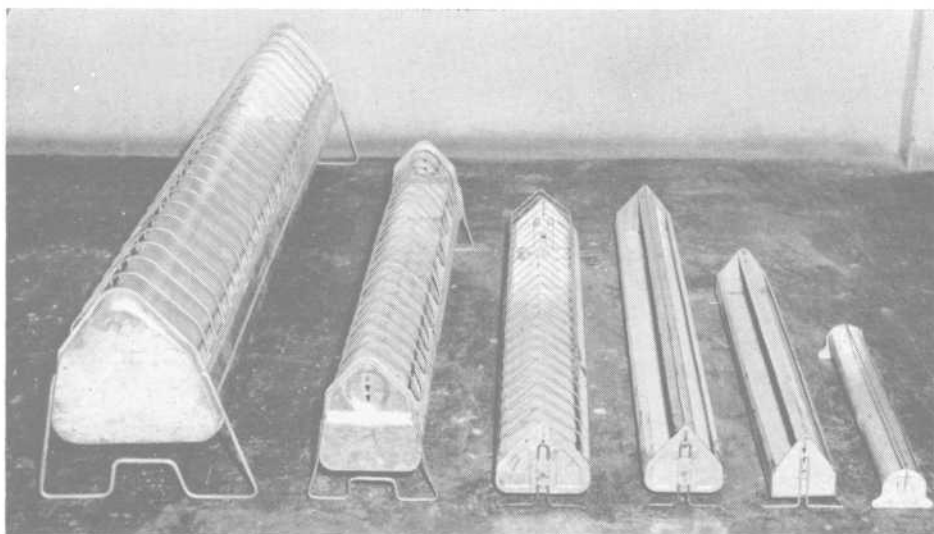
Grit must be fed in very small quantities, so that the young chicks will not eat too much. The best plan is to put a little over the top of the mash, and a small quantity from time to time in the litter.

When the chicks are placed out of doors, a small hopper with some grit in it may be kept on the wall of the house. Usually the birds get the grit they need out of the ground.

## **Before Chicks Arrive**

Here are things to do before your chicks arrive:

1. Clean the brooder house. Sweep and scrub it with hot lye water. Use one 13-ounce can of lye to 5 gallons of hot boiling water.
2. Use a good disinfectant and spray walls, floors and equipment.
3. Take the brooder apart to clean and sun it, feeders and all, for one day before using.



Feeder sizes vary according to need. Start with the low, baby-chick feeder (at right), and work up to the laying-flock feeder (at left). Use each size as chicks grow and develop.

4. Start the heat in the brooder at least 24 hours before the chicks arrive. Regulate the heat inside of brooder according to outside temperature. For the first week the temperature should be between 90° F. and 95° F. Gradually reduce it each week thereafter.

5. Fill the hopper with feed and fill water vessels with water before chicks are placed in brooder.

3. Feed and water the chicks at the time they are put under the brooder.

4. Put the chicks in a good regulated brooder.

Watch your chicks. They are a good guide as to temperature of the brooder. The successful poultryman is guided not only by the registered temperature, but also by action of the chicks.

## How to Start Chicks

Follow these suggestions for starting chicks:

1. Pick them up at the hatchery yourself.

2. See that the chicks are not chilled in delivery and transferring to the brooder.

When the chicks are comfortable they spread out in the brooder with their heads lying on the litter, with wings spread out.

If the chicks are restless or huddled together they are too warm or too cold.



Here is good distribution of feeding and watering equipment.

## Care of Growing Stock

The brooding stage for chicks will last until no more artificial heat is needed. This will vary from 6 weeks to 2 months.

### Separate Cockerels

As soon as sex can be determined, the cockerels should be separated from the pullets. This will be at 6 to 10 weeks of age.

Chicks should be separated because cockerels grow faster and

are stronger, crowding the pullets away from feed and crowding them when they roost. Besides, the cockerels should be confined where they can be fattened and sold as fryers or broilers. Incidentally, they show better feed utilization when kept separate from pullets.

At this age the cockerels should be fed a broiler mash until marketed. This would be true when raising both sexes for fryers or broilers. Early marketed fryers and broilers usually bring the best price.

## BROODING GUIDE

Age	1st week	2 to 4 weeks	4 to 8 weeks	8 to 12 weeks
Brooding temperature	Manufacturer's directions. Usually 90° F. at edge of hover two inches above litter — Under hover with electric brooders.	Manufacturer's directions. Usually reduce 5° F. per week until 70° F. is reached. Better guide is action of chicks. If temperature is correct will form a ring at night about 6 inches away from edge of hover, or spread out evenly under electric hovers.		Usually heat discontinued about sixth week, except in cold weather. Otherwise chicks may crowd.
Type of house space required for floor brooding	Well-built, easily ventilated house. Allow ¼ sq. ft. floor space per bird. Do not brood more than 300 to 350 chicks per unit. Allow 7 sq. in. hover space per chick.		Not later than 6th week remove cockerels. If confined to house (no range) allow 1 sq. ft. floor space per bird.	Move to clean range if available. 10 x 10 ft. range shelter holds 125 birds.
Feeding program	Have feeders filled with starting mash when chicks put in house. Do not starve chicks. Grit should be available.		Grain feeding usually started at 4 to 6 weeks. Give green feed.	
Feeding equipment	Provide 1 lineal inch feeder space per chick. In addition, place feed on paper, shallow pans, box lids, etc., for 1 to 3 days.		Not later than 6th week change to intermediate hoppers. Allow 2 to 2½ lineal inches of feeder space per chick.	Change to range type feeders. One 5 ft. hopper per 100 pullets.
Water supply	Provide at least one-quart fountains (or equivalent in other types of fountains) per 100 chicks.		Not later than 6th week change to larger fountains. Allow 2 to 3 gallons per 100 chicks.	Use range type fountain on range.
Miscellaneous equipment	Use check guard to encircle hover to keep the chicks near heat, remove at end of first week.	Round out corners.		

## BROODING GUIDE (Continued)

Age	1st week	2 to 4 weeks	4 to 8 weeks	8 to 12 weeks
<b>Litter</b>	Absorbent litter, such as straw, shavings, peat moss and sand, reduce labor as they can be kept dry by stirring frequently and need not be replaced until they become damp. Additional litter may be added as needed.			
<b>Sanitation</b>	Clean thoroughly before chicks arrive; use lye; scrub fountains daily. Keep house and litter dry.	Allow chicks outside at 2 to 3 weeks. Move house frequently if portable. Sun porches are desirable if ground contaminated.	Move feeders often. Keep chicks and adult birds apart.	Range shelters usually have wire floors. No litter.
<b>Miscellaneous management</b>	Operate brooder 2 or 3 days before chicks arrive. Keep feeders $\frac{3}{4}$ full. Arrange feeders so all chicks can eat at once.	A night light will help prevent piling at night (10 watts). Remove brooder stove when no longer needed. Separate pullets and cockerels. Prevent cannibalism by allowing plenty of floor space, reduce temperature rapidly, cover windows to admit subdued light. Let chicks outside as soon as possible. Paint chicks with tar or prepared salve. Putting 1 or 2 percent salt in the ration may help. Painting the windows red often stops picking.		
				Treat for worms if necessary. If pox prevalent, vaccinate after birds are 8 weeks old. Cull out weak and poorly developed birds as noticed. Provide plenty of shade, either natural or artificial.

## **Pullets on Range**

The ideal place for growing out pullets is a clean range away from adult birds. An alfalfa, grain or grass field or orchard is excellent.

If natural shade is not available, provide artificial shade. A range shelter gives very satisfactory protection. Such equipment can be moved easily to new locations.

Pullets should be well matured before they come into production. Undersized birds lay a small egg for a much longer period than those reasonably well matured when egg production begins. There is considerable doubt whether such birds will ever lay as large an egg as a bird which is well grown.

Pullets that start laying while immature are less resistant to disease. The extra strain of egg production while they are still growing weakens their systems. It is not uncommon for such birds to lay a short time and then break down.

## **Types of Feed**

Commercial feeds for growing pullets are prepared in the forms of mash, pellets, crumbles and scratch grain. The pellets and crumbles are mashes put up in this form.

In the all-mash (complete ration) system of feeding, the grains are ground and mixed with the mash, pellets or crumbles. The scratch-and-mash system is where the grain and mash is fed separately.

The general practice is to feed a growing or developing ration from 6 weeks of age until the pullets start laying, then change to a laying ration. Follow the recommendations of your feed dealer to get the best results.

It is necessary to feed the growing pullets so that good growth and development is maintained throughout the growing period. This is important if you are to get the proper growth for the birds to start laying as they reach maturity.

# **Care of Laying Birds**

Raising even the best pullets grown from clean stock and developed to sturdy, healthy birds on clean range, does not insure egg production. The young pullets must be placed in clean laying quarters and given clean feed and the best of care possible.

## **Good Management**

A lot of time and money go into raising chickens to laying age. Cash returns come from the eggs they produce. Only if your layers have good management after they

are put into the laying house can you obtain the highest returns.

## House Your Pullets

The best time to house the laying flock is when the pullets are ready to lay their first eggs, although they may be housed any time during the growing season.

### Ready to Lay

As a pullet gets ready to lay, she usually becomes more tame. Her comb and wattles grow or enlarge and become bright red in color. She sings more and looks for a place to make a nest.

If you pick her up, you will notice that the vent is a little moist. If she has deep yellow color skin, the vent may show just a trace of beginning to lose some of its yellow color.

The bone on each side of the vent is the pubic bone. In the pullet that has never laid, the ends of these bones come together so that they almost touch. They begin to spread apart when she starts to lay.

It is best to house those pullets that are well grown. All should have bright red faces, combs and wattles, and these should be well developed for the kind of bird.

### Healthy Signs

The pullets should be healthy as indicated by: (1) Bright clear appearance of their eyes; (2) healthy red color of the head and face; (3) smooth well-finished condition of their plumage; (4) deep

yellow pigment of their skin, shanks and beak.

Poor quality birds show less color. Those that may carry some infection usually have little color. The plumage of the poor birds will usually be dull in appearance and the feathering not fully complete. The feathers will be rough—quite different from the tight, slick-looking plumage of the best birds.

Pullets that begin laying in August or September and produce well for the following 6 months make the most profit. The income from high production is best in the months of better prices.

Keep flocks of high laying quality for a full laying year.

### Always Be Ready

No matter what time of year you place pullets in their permanent quarters, first thoroughly clean and disinfect both house and equipment. Take all movable equipment out of the house, scrape and wash it clean, disinfect, and allow it to dry in the sun.

Brush down the ceilings and walls of the house and scrape the floors. Use one 13-ounce can of lye in 5 gallons of boiling water to help remove the dirt. Be careful when using this solution, as it will burn if it comes in contact with your skin.

When they are dry, paint or spray the dropping boards or pits, roosts, roost supports with creosote or carbolineum. After washing feed hoppers, platforms and wooden rests, spray them with a good disinfectant such as a 5-percent compound cresol. Lye is a cleaning agent, not a disinfectant.



### Housing Layers at Night

You will be more successful if you house your pullets at night and place them on the roosts. If more than one pen is to be filled, house birds of equal maturity together.

Put the more mature birds in one pen and the less mature birds in another. If they are all to be placed in one pen, you might leave

the less developed birds on range for another week or two. Or cull them out and sell them as market birds.

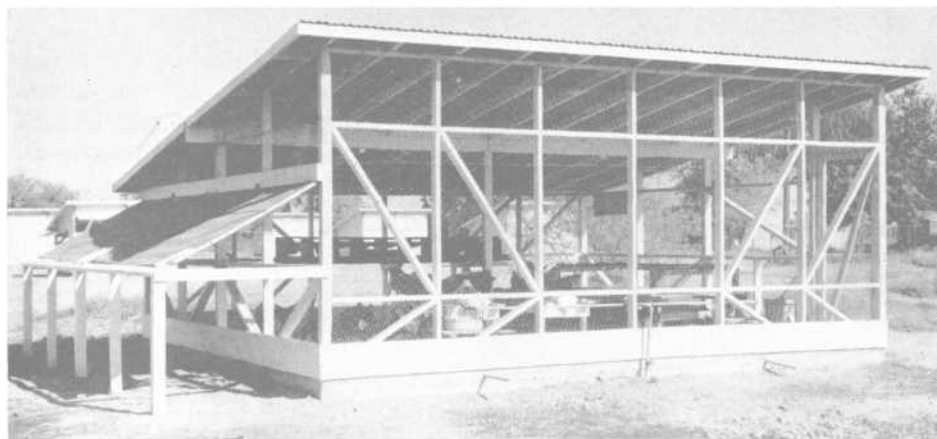
Allow  $3\frac{1}{2}$  to 4 square feet of floor space per bird for Reds, Rocks and other heavy breeds. Leghorns and other small breeds require at least 3 square feet of floor space per bird.

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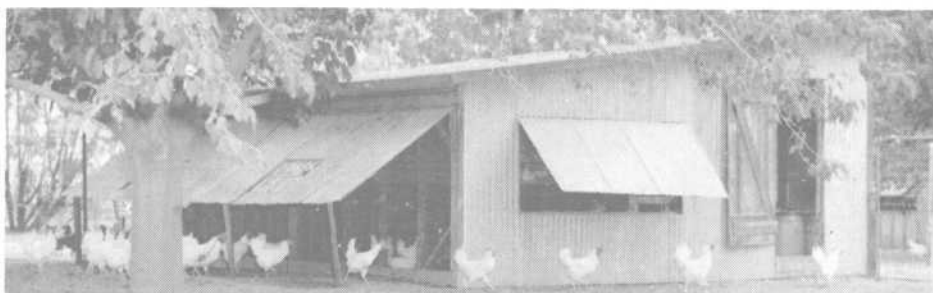
### Space Requirements for Layers

Floor:	3 square feet per bird for small breeds. $3\frac{1}{2}$ to 4 square feet per bird for large breeds.
Window:	1 square foot per 5 square feet of floor space (for higher-elevation counties).
Feed Hopper:	4 lineal inches of feeding space per bird.
Water Container:	5 two-gallon water fountains per 100 birds.
Roosts:	8 lineal inches per bird.
Nests:	1 nest per 4 birds, or community nests.

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Here's a good poultry laying house for the lower-elevation counties where temperatures are not low.



**This poultry laying house is suitable for use in all counties in Arizona. In higher-elevation counties, insulation is required.**



**The houseless system may be used in the lower-elevation counties. The roosts are outside. Shelter is provided for feed, water and nests.**



**The individual laying-cage system may be used in lower-elevation counties.**



**Deep litter in the laying house is important.**

### **Provide Good Litter**

After the house has dried out, spread an inch or two of sand or fine gravel on the floor. Put back the equipment and add three or four inches of litter. Oat straw, wheat straw, shavings or peat moss make satisfactory litter.

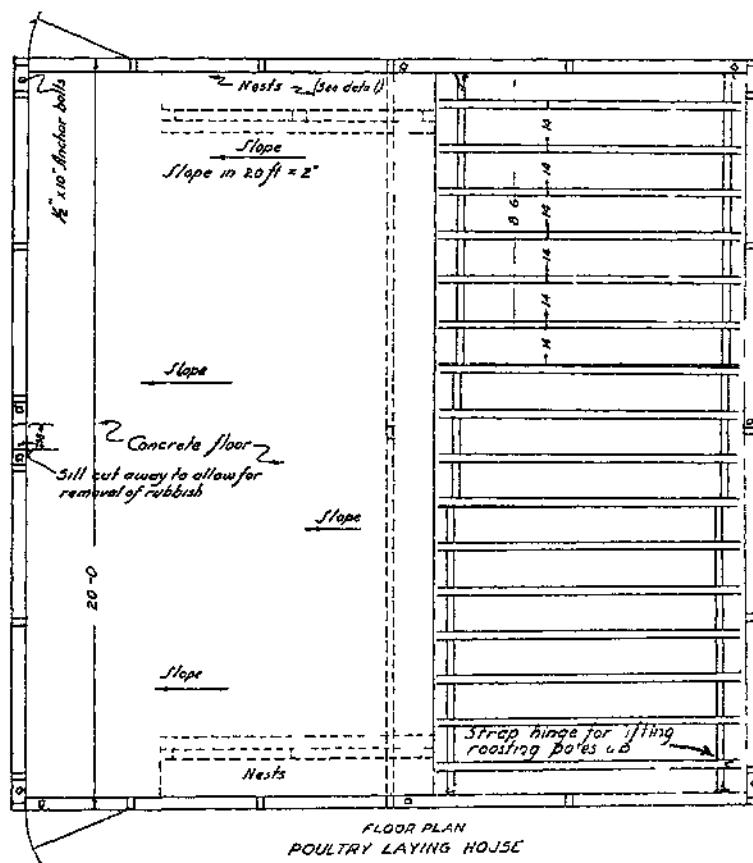
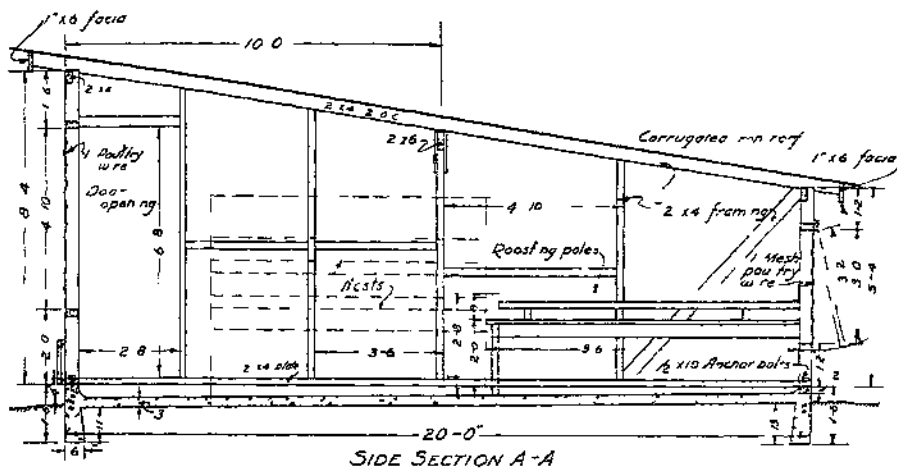
As litter becomes broken up and settles down, add more. Build up litter depth to 6 or 7 inches by the time cold weather arrives.

Stir the litter often to keep it loose. Remove any litter that becomes damp or caked. Damp or wet litter may be caused by overcrowding birds, poor ventilation, water spilled from water containers.

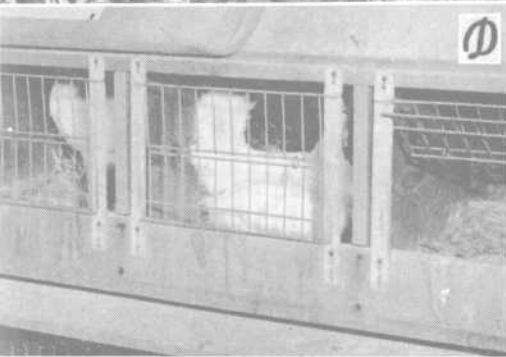
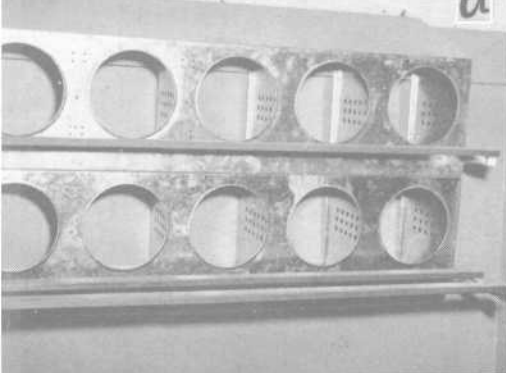
### **Have Plenty of Hopper Space**

Mash hoppers should provide about 4 inches of feeding space for each bird. Three 5-foot hoppers with feeding space on both sides gives 30 feet of feeding space, which is enough for 100 birds. If grain is hopper-fed, the same amount of space is needed as for mash.

Never fill hoppers so full that the birds can bill out the feed. Feed falling into the litter, especially mash, is a complete loss and may result in your failure to have a profitable flock.



This is a floor plan and side section of a poultry laying house.



←There are several types of laying nests. "A" shows the individual metal nests. "B" is a picture of the individual laying nests made of wood. "C-1" and "C-2" are community laying nests. "D" shows a type of trap nest used in carrying out a definite breeding program.

## Plan Clean Nests

Have plenty of clean nesting space and train pullets to lay their eggs in the nests. Have 1 nest for each 4 birds or 3 community nests 24 inches deep and 4 feet long for a flock of 100 birds.

Your choice of several kinds of nests will depend somewhat upon the size of your flock. The best nests are simple in construction (portable and easy to clean), retain the nesting material, and provide semi-darkness for the hen's comfort.

The nests should be of a type that makes it easy for you to pick up the eggs without unduly disturbing any birds that are laying.

## Water Is Important

Water is as important to the poultry flock as feed. Sixty-five percent of an egg is water. High-producing birds need large quantities of water for body needs as well as for use in making the egg.

Water must always be fresh and clean. Also, it must be available at all times so that the birds can drink whenever they desire.



The automatic water fountain above is properly installed to prevent wet litter.

Many watering devices are satisfactory. They should meet the following requirements: (1) Substantially constructed for lasting service; (2) light in weight; (3) economical in cost; (4) of a type that can be quickly and cheaply replaced if necessary; (5) convenient to fill; (6) easy to clean; and (7) have ample drinking space.

One hundred laying birds drink an average of 5 gallons of water a day.

#### **Automatic Waterers Help**

In addition to the usual drinkers, it is well to consider an automatic or running water supply. Even for a small flock, an automatic supply of water may be the best and cheapest.

Dampness in the poultry house is a most serious problem. You may spill water when you fill the drinkers. The birds may spray or waste water when drinking. This dampness from water falling in the litter spreads farther and farther day after day.

To prevent this, place the water container in or on a wire-covered or slotted rack. Box in the space under the rack, and place over opening into floor which will allow spilled water to go into the ground.

### **Dropping Boards Or Dropping Pits**

In order to prevent crowding, allow from 8 to 10 lineal inches of roosting space for each bird, depending on size. A distance of 15 inches between perches is generally recommended.

Perches 2 inches wide with slightly rounded corners seem to be the most satisfactory. They should be placed at right angle to the rear wall. This will prevent crowding of the birds.

Dropping boards or dropping pits should be provided under the roosts. In either case, chicken-size wire netting under the perches will keep the birds out of the droppings.

#### **Clean Boards Often**

Dropping boards should be built on a level shelf with the perches about 1 foot above them. If the dropping boards are cleaned frequently, the laying pen is clean and there is little unpleasant odor. Dropping boards make more floor space available.

Dropping pits need less frequent cleanings during the year and save

time if you give them proper care. One way to construct a dropping pit is to box in on the floor of the pen a space large enough to cover the section directly under the roosts.

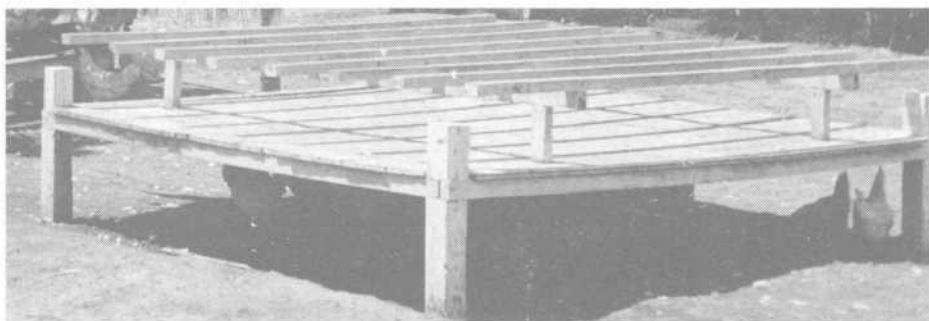
A wire-covered top prevents the birds from contact with the droppings. The perches may be fastened directly on top of the wire or they may be placed on a frame above the wire.

The droppings accumulate for indefinite periods. The time to clean is determined by the number

of birds in the flock and the depth of the pit. A good schedule is to clean the pit once a month.

### Control Odors

The disadvantages of a dropping pit are that the accumulations of manure not only make an undesirable odor but are displeasing in appearance.. The odor can be controlled partially by sprinkling small quantities of acid phosphate or lime over the droppings from time to time. This also adds value to the manure.



Dropping boards (above) are used below roosting perches.



The dropping pit is very popular. This type of perch (as shown above) requires less labor than dropping boards. You do not need to clean them as often.

# Feeding for Maximum Egg Production

Feeds and feeding methods probably have the most important influence on the cost of production and profits. That is why you need to take great care in the selection and use of feeds. A great many possible combinations of feeds will give good egg production.

## Commercial Feeds

Commercial feeds are prepared in the form of mashes, pellets, and crumbles. They are to be fed as an all-mash feed, or in combination with scratch grain.

Be guided in your choice by the results secured by others and by the reputation of the local feed dealer. In addition, consider costs.

## All-Mash Feeding

With the **all-mash** (complete ration) system of feeding, grains are ground and mixed into the mash, pellets or crumbles. Some poultrymen put enough feed into the hopper about 5:00 p.m. to last until the next evening. This is known as "controlled feeding."

Other poultrymen keep mash in the hoppers at all times or use self-feeder hoppers.

### Fill Hoppers Only $\frac{2}{3}$ Full

To prevent waste from spilling feed, fill hoppers only one-half to two-thirds full. If birds begin to lose weight, give them a little scratch grain each afternoon, about 2 to 3 quarts for 50 birds.



This is a good type metal feeder.





Here is a good arrangement of self-feeders in the laying house. The self-feeders are for mash. Trough feeders are used for scratch.

## Scratch-and-Mash

With the **scratch-and-mash** system, grains and mash are fed separately. The scratch grain maintains body weight and the mash helps produce eggs. The amount varies with the breed of poultry, condition of the flock, egg production, and the time of year.

In general, give your layers half scratch grain and half mash during the winter months. Feed more mash and less scratch grain in spring, summer and fall. Light breeds, such as Leghorns, require somewhat less grain than mash.

Pullets just starting to lay may need scratch until they are fully grown. Give birds in heavy production heavier grain feeding to keep up body weight.

If production drops, put on lights or feed a wet mash to get birds to eat more.

## Wet Mash

Use milk or water to prepare a wet mash and add enough to make the mash crumbly. Digestive upsets usually follow feeding a mash that is too wet.

Generally, about as much of the moistened mash as the birds will clean up in 20 minutes is given once a day during the fall and winter months. The more mash that the birds can be encouraged to eat, the greater the egg production.

## Scratch Grain

You may give scratch grain morning and night or just at night. Most poultrymen using the former method like to give a quarter to a third of the scratch grain in the morning and the rest in the late afternoon.

Grains can be fed in the litter or in hoppers.

## Green Feed

For many years poultrymen have recognized the value of green feed in the poultry diet in maintaining health and egg production. Alfalfa, small grains and lawn clippings are good sources of green feed.

Feed the laying flock 5 to 6 pounds of green feed per 100 birds per day. If green feed is not available, feed alfalfa hay by placing the bale in the pen without removing the wires.

## Artificial Lights

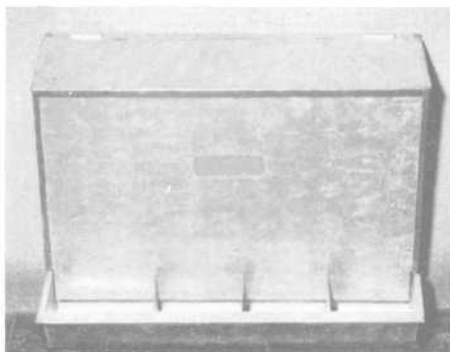
Artificial lights are not essential but do help in increasing fall and winter egg production. Use one 40-watt bulb to each 200 square feet of floor space. Adjust the lighting so that birds have a 13-hour day.

In general, it is not necessary to start lights until October. They may be discontinued in March.

## Oyster Shell and Grit

Laying birds require large amounts of calcium. Oyster shell is the most common form in which this mineral is provided. A supply should be kept before the birds, even though a small quantity is in the laying mash, since some birds need more than others.

Chickens on the range may get all the grit they need, depending on the amount present. Birds kept



**Here's a wall-type metal grit and shell hopper.**

in confinement without access to the soil must be supplied with grit for best results.

Native gravel or granite serve the purpose very well.

## Amount of Feed

The laying hen of light breeds will usually consume from 75 to 80 pounds of feed (total scratch and mash) a year. Hens of the heavier breeds will eat about 10 pounds more.

A daily feed for 100 laying hens is from 10 to 12 pounds each of mash and grain.

A growing chick will consume about 5 pounds of feed the first 8 weeks, or a total during the first 24 weeks of 25 pounds.

The amount consumed varies largely according to breed, season of year, supplemental feeding (green feed, table scraps, etc.) and palatability of feed.

### Buy Feed in Large Amounts

Regardless of the size of the flock, buy feed in large enough



The feed containers shown above are very popular. Large containers can be used for mash. The smaller ones are for scratch grain. The coal bucket is very handy to carry and put feed into hoppers.

quantities to keep the flock supplied for at least a month or longer.

Buying feed in larger quantities has several advantages. It is cheaper; you are more certain of a particular mixture; and you protect your flock by having a more uniform ration and enough feed

to give them what they need.




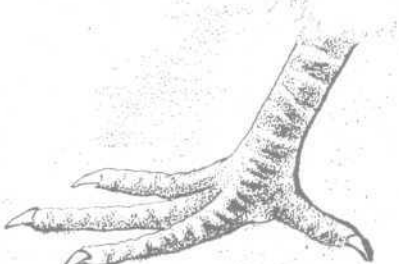
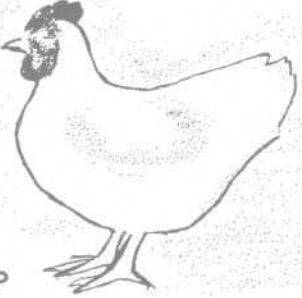
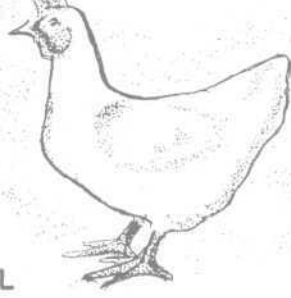
It is a financial loss to store feed where mice can get into it. Put the feed in a metal feed container, or in a bin built in the laying pen. You may use an adjoining feed room, or any other convenient place.

## Culling the Laying Flock

(Reference — Extension Circular 159, "4-H Poultry Judging and Exhibiting.")

Culling the laying flock is a continuing job. A carefully planned system of selection based upon

bleaching of the pigment of the beak, shanks, and other parts of the body, and thorough observations on molting is extremely useful in separating the poor layers from the good ones in any flock.

 <p><b>KEEP</b> combs &amp; wattles - smooth, big, full eyes-bright. beak-free of yellow</p>	 <p><b>SELL</b> combs &amp; wattles - small, shriveled, pale. beak-yellow with pigment.</p>
 <p><b>KEEP</b> legs are free of yellow pigment</p>	 <p><b>SELL</b> legs are yellow with pigment</p>
 <p><b>KEEP</b> feathers worn and dingy indicate no molt and good production in the past.</p>	 <p><b>SELL</b> molting of neck and body during summer means 4-6 months vacation</p>

### CULLING GUIDE

Study this culling guide. It will help you.

## Culling Chart

The culling chart (below) is arranged so that you may see at a

glance the difference between body characteristics of good and poor, laying and non-laying hens. Study it and learn how to select layers.

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### Characteristics Identifying Layers and Non-Layers

Laying Hen	Character	Non-Laying Hen
Large, red, waxy, full	Comb	Small, pale, scaly, shrunken
Bleached or bleaching	Beak	Yellow or growing yellow
Bright, prominent	Eye	Dull, sunken
Bleached	Eyelids	Yellow
Neat, refined	Head	Beefy, crow head
Flexible, wide apart	Pelvic bones	Stiff, close together
Deep, soft, pliable	Abdomen	Shallow, tough, light
Large, moist, bleached	Vent	Dry, puckered, yellow

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### Characteristics Indicating Rate of Past Production

Good Layer	Character	Poor Layer
Alert, friendly, active	Temperament	Dull, listless, wild
High vitality	Health	Low vitality
Wide, long, straight	Back	Narrow, short, tapering
Deep	Depth	Shallow
Long, good spring	Ribs	Short, lacking spring
Large, deep, strong	Head	Shallow, weak, crow head
Neat, clean cut, refined	Face	Coarse, beefy, wrinkled
Bright, prominent	Eye	Dull, sunken
Short, stout	Beak	Long, thin
Soft, thin, silky, loose	Skin	Coarse, thick, dry, light

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## Selection Calendar

(From U.S.D.A. Farmers Bulletin 1727, "Selecting Hens for Egg Production.")

### January

Keep hens that complete their annual molt this month. Leg-band as good layers, pullets with well-bleached beaks and shanks.

### February

Select hatching eggs and baby chicks with great care. Continue to leg-band pullets that have thoroughly bleached beaks and shanks.

### March

Market non-laying hens and pullets that have yellow beaks and shanks. Break up broody hens and leg-band them for marketing later, unless it is necessary to use them for incubation.

### April

Continue to market hens and pullets with yellow beaks and shanks, if not laying. Market broody hens that wear a leg band indicating previous broodiness.

### May

Market old breeders not valuable enough to keep for another year. Watch for early molters; they are usually low producers. Remember that market prices for fowls are usually better at this time than later.

### June

Market early molters, thereby reducing feed costs. Try to maintain a 50 percent production during the summer months. Begin annual selection this month.

### July

Continue marketing molters. Early molters are usually slow molters. Market slow-growing pullets.

### August

Keep hens that are still laying this month. Market those which are well into the molt. Remove weak and unthrifty pullets from the growing flock.

### September

Leg-band, as persistent producers, hens that molt late this month or that have laid throughout the month. Band as good producers, all pullets that begin laying this month.

### October

Continue to band hens that begin to molt during this month and those that are still laying. Continue to select and band the early maturing pullets.

### November

Make up breeding pens comprising hens that matured early, laid at a good rate, were non-broody and showed persistent production. Early hatched pullets that began laying this month will be fair producers. Late hatched pullets that come into laying this month will be good producers.

### December

Band, as good layers pullets that now have bleached beaks and show some bleaching in shanks. Early hatched pullets that begin to lay this month will be poor layers. Hens that molt this month are persistent layers and may be kept for another year.

### Any Month

Remove all birds showing weakness or disease.

# Controlling Poultry Diseases and Parasites

(Reference — Extension Circular 112, "Prevent and Control Poultry Diseases and Parasites.")

The best practice to follow when a bird gets sick is to **get rid of it**. It does not pay to doctor sick birds. Either bury or burn them.

## Sanitation Is Essential

Sanitation is the best disease weapon. The most important practices to follow are: (1) Buy disease-free birds; (2) isolate, segregate, quarantine or destroy sick birds; (3) keep all equipment, houses and yards clean; (4) provide proper housing and equip-

ment; (5) provide proper feeding and care.

When several birds become sick at the same time, call your leader or County Agricultural Agent. If you want definite diagnosis, send to the Animal Pathologist, University of Arizona, three or four of the sick birds. These birds should arrive at the University **alive** and not on a Saturday or Sunday.

The diseases most likely to appear in baby chicks, growing stock and laying hens can be found in Extension Circular 112, "Prevent and Control Poultry Diseases and Parasites."

## Egg Quality Counts



(Reference — Extension Circular 159, "4-H Poultry Judging and Exhibiting.")

When the hen lays an egg, she gives a fresh, high-quality package of food. It is up to you to preserve that quality with the best possible methods.

Follow these practices in the marketing of quality eggs:

1. Secure chicks from stock which has been bred to lay large eggs.
2. Keep clean, dry litter in the laying house.

▲ A wire basket is best for gathering eggs.

3. Provide 1 nest for every 4 hens.

4. Keep plenty of clean nesting material in nests. (Straw, shavings, excelsior, peat moss, etc.)

5. Provide wire netting under the roosts.

6. Produce only infertile eggs.

7. Break up broody hens immediately.

8. Gather eggs at least 3 times a day in a wire basket.

9. Produce clean eggs.

10. Cool eggs immediately and hold in a cool place (40° F. to 55° F.).

11. Maintain a high moisture supply where eggs are held.

12. Market at least twice a week, preferably 3 times a week.

13. Prevent rough handling of eggs and extreme temperatures while enroute to market.

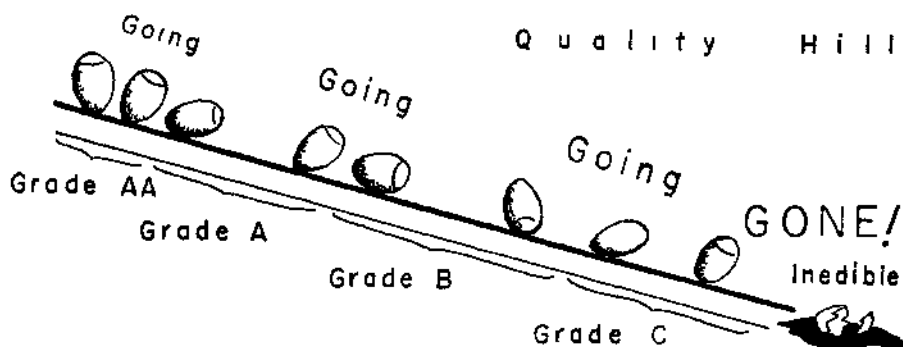
14. Place eggs in cartons or cases with large end up.

### Learn About Egg Grades

Quality and grades are determined on the following:

1. Eggs must be clean and sound in shell. Cracked eggs and dirties are graded separately.

2. The air cell must be small and regular,  $\frac{1}{8}$  inch in depth for U. S. Grade AA,  $\frac{1}{4}$  inch in depth for A,  $\frac{3}{8}$  inch in depth for B grade, and over  $\frac{3}{8}$  inch for C grade.



### THE QUALITY JOURNEY OF AN EGG

Any edible egg is somewhere on "Quality Hill." The grade tells where. Egg quality is perishable; is finest when first laid; starts its downward journey at once; makes the journey quickly in high and slowly in low temperatures; and at home or market depends on conditions under which the eggs are held. Egg quality and grades on the market are determined by: (1) size or weight, (2) shell condition, (3) size of air cell, (4) condition of white, and (5) condition of yolk.



3. Yolk must be centered and dimly visible. Eggs with yolks well defined, mobile and showing germ development or meat and blood spots, are placed in lower grades.

4. The white must be firm and clear. Egg whites become watery with age.

5. Eggs are usually graded into size groups with the following minimum weights: Large eggs, 24 oz. per dozen; medium, 21 oz. per dozen; and small, 18 oz. per dozen.



Here is simple equipment for candling eggs.

## Market Classes of Poultry

Most poultry is sold alive to local dealers. A small percentage is killed and dressed by producers.

The market classes in common use are shown below.

**Broilers:** Young chickens approximately 8 to 10 weeks old of either sex, of marketable age, but not weighing over  $2\frac{1}{2}$  pounds each.

**Fryers:** Young chickens, approximately 10 to 14 weeks old, of either sex, weighing over  $2\frac{1}{2}$  pounds and under  $3\frac{1}{2}$  pounds each.

**Roasters:** Young chickens ap-

proximately 4 to 8 months old of either sex, weighing over  $3\frac{1}{2}$  pounds.

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

**Cocks:** Old male birds.

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

# **Suggested Topics for 4-H Demonstrations**

## **Management Practices**

1. Preparing the brooder house for baby chicks.
2. Purchasing quality chicks.
3. Selection of hatching eggs.
4. Marking birds for identification; toe punch, wing band, and tattooing.
5. Selecting laying hens.
6. Production of caponettes (chemical caponizing).
7. Deep built-up litter for laying houses.
8. De-beaking to prevent cannibalism.
9. Feeder requirements for different ages of birds.
10. Steps to follow in brooding chicks to 12 weeks of age.

## **Exhibition**

1. Selection of exhibition birds.
2. Fitting and showing exhibition birds.
3. Selecting eggs for exhibition.

## **Marketing**

1. Production of quality eggs.
2. Know the eggs you buy.
3. Killing and dressing birds.
4. Preparation of dressed birds for cooking.
5. The formation of the egg within the body of the hen.

## **Disease and Parasite Control**

1. Testing for Pullorum reactors.
2. Vaccinating for the control of Fowl Pox.
3. Vaccinating for the control of Laryngotracheitis.
4. Vaccination for the control of Newcastle.
5. Methods of controlling Poultry Lice.
6. The control of Round Worms.
7. The control of Blue Bugs.

## **Equipment That Can Be Made**

1. Shipping coop.
2. Laying mash hopper.
3. Baby chick feeder.
4. Catching hook.
5. Egg candler.
6. Stand for water fountains.
7. Feed scoop.

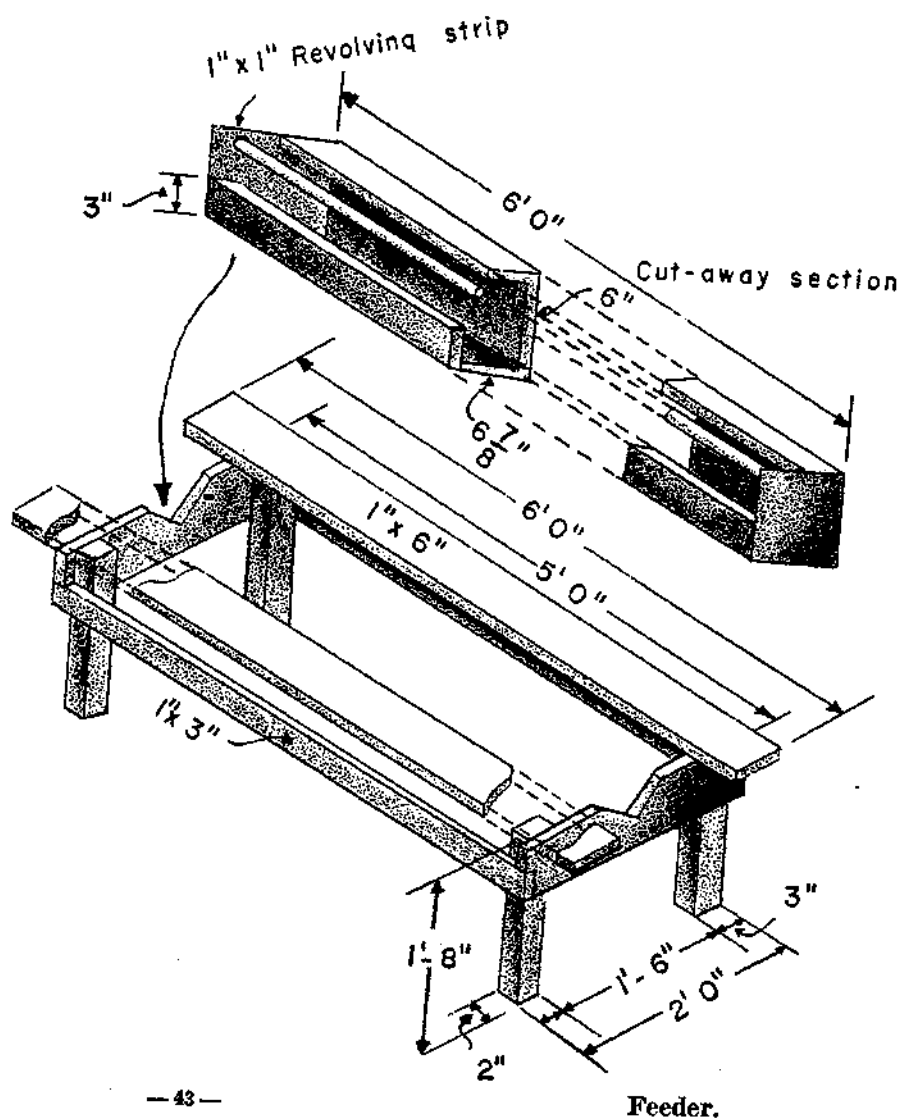
## **Additional References**

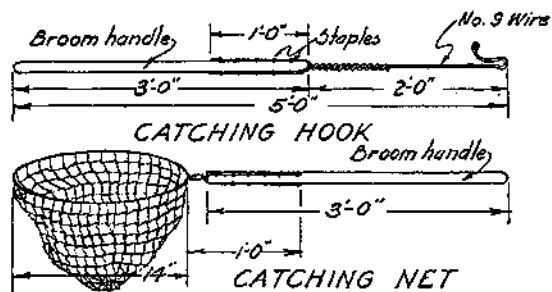
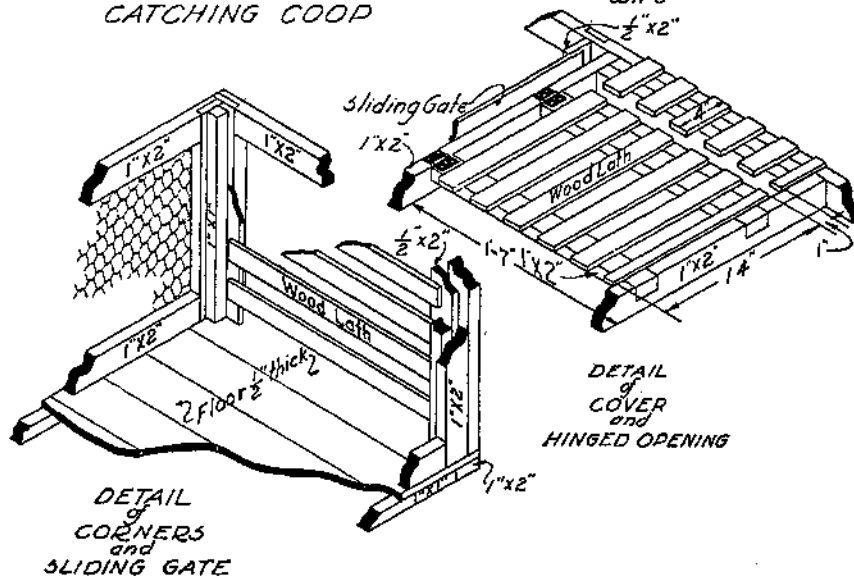
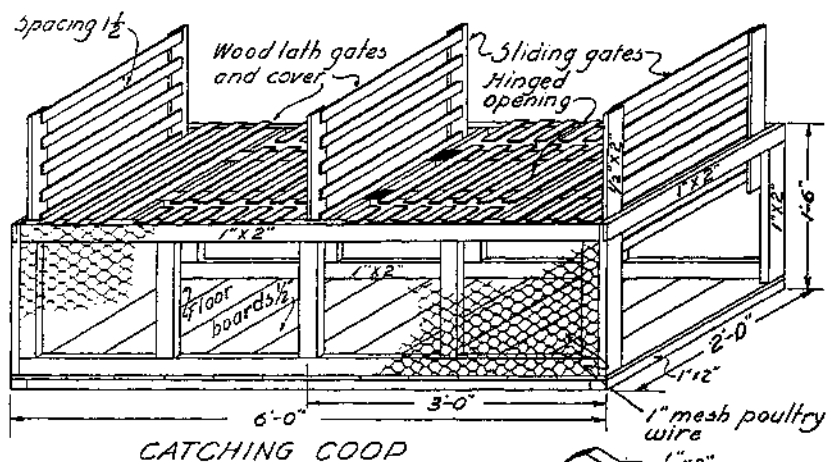
- Extension Circular 159, "4-H Poultry Judging and Exhibiting."  
Extension Circular 112, "Prevent and Control Diseases and Parasites."  
U.S.D.A. Farmers Bulletin 1524, "Farm Poultry Raising."  
U.S.D.A. Farmers Bulletin 1538, "Incubation and Brooding of Chickens."  
U.S.D.A. Farmers Bulletin 1378, "Marketing Eggs."  
U.S.D.A. Circular 446, "Poultry Management in Subtropical and Semiarid Climates."

Acknowledgment is hereby made for material and suggestions in connection with the preparation of this circular to the Poultry Department, University of Arizona, Tucson; to co-workers and others who have been of assistance; and to Extension Service publications of other states.

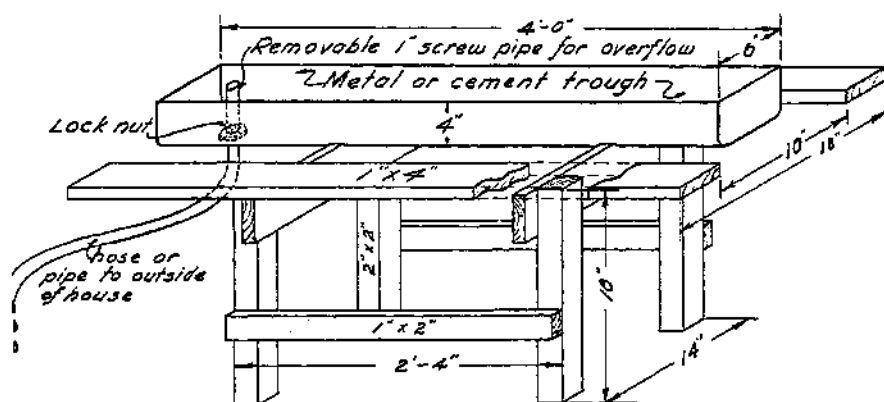
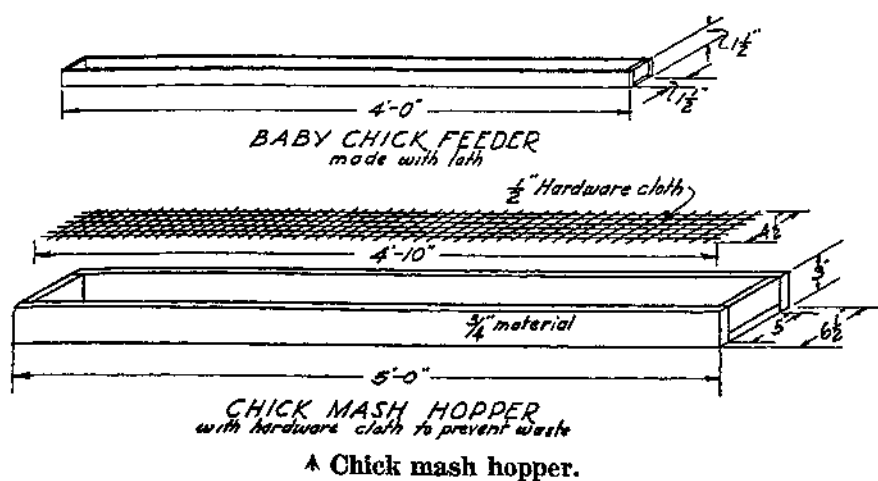
The cover picture is of Rowena Slocum, 4-H poultry club member of Yuma.

## Equipment You Can Make



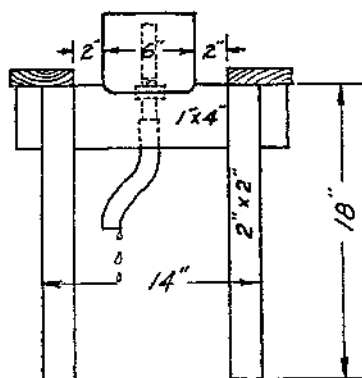


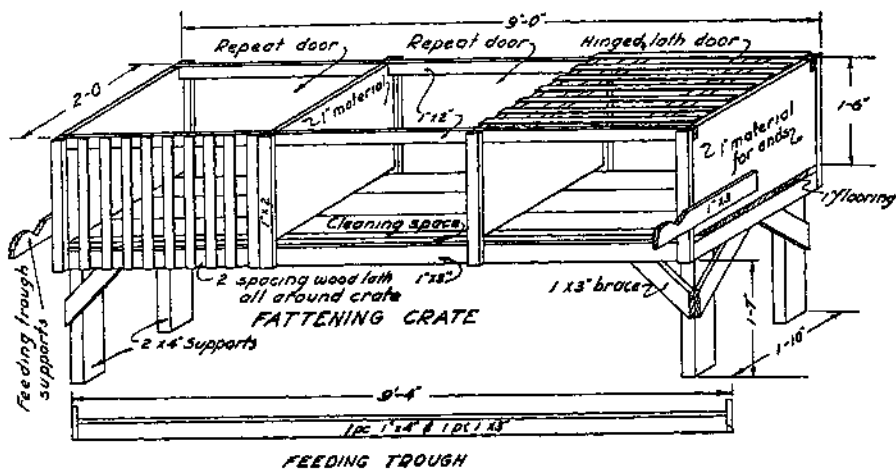
Catching coop and net.



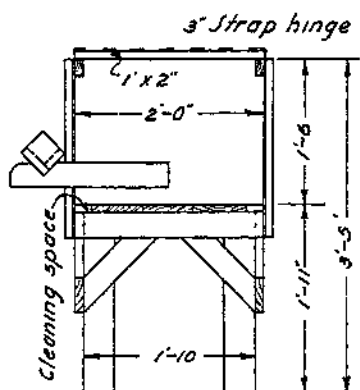
▲ Drinking trough with stand.

End view of the drinking trough  
shown above.



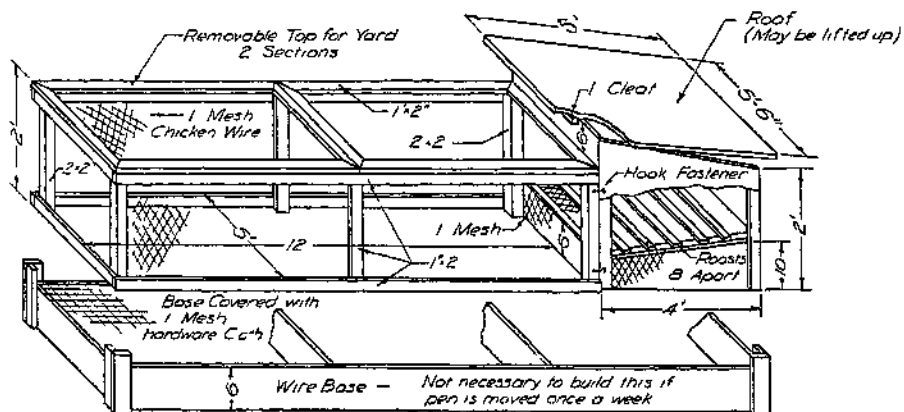


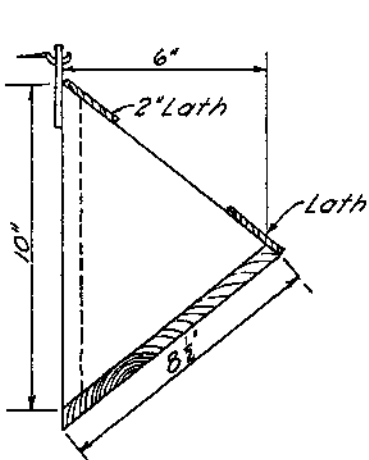
▲ Fattening crate.



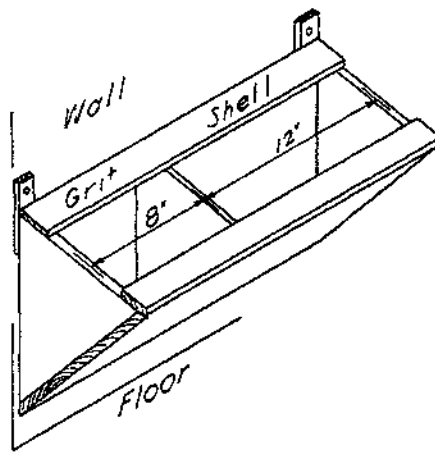
← End view of the fattening crate.

▼ Here's an outdoor pen for 25 to 50 chickens.

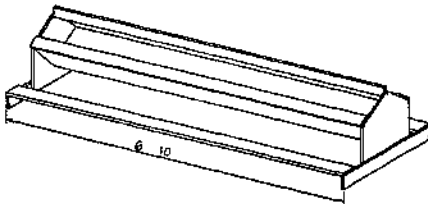
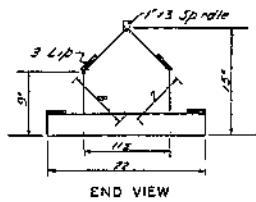




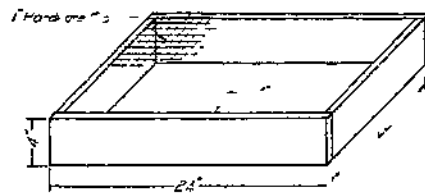
END VIEW



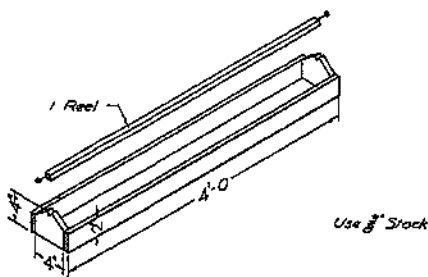
▲ Grit and shell hopper.



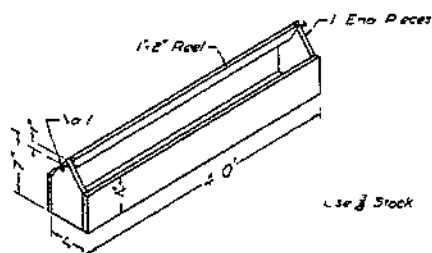
▲ V-trough hopper for layers.



▲ Wire platform and water fountain (for chicks over three weeks old.)

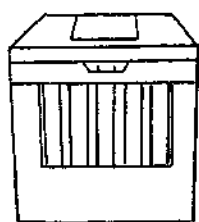


▲ Feeder for chicks up to 2 to 3 weeks old.

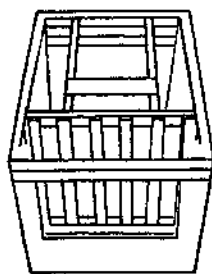


▲ Feeder for chicks over three weeks old.

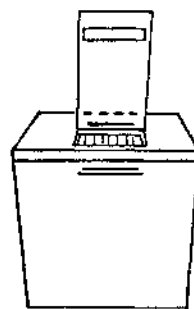




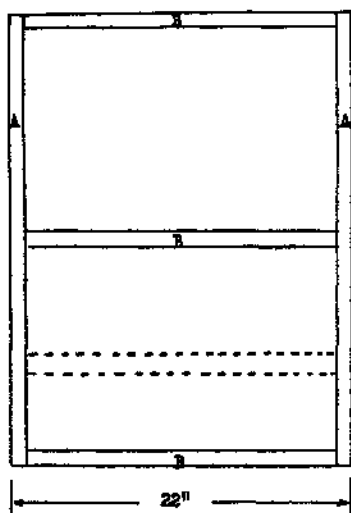
Front View



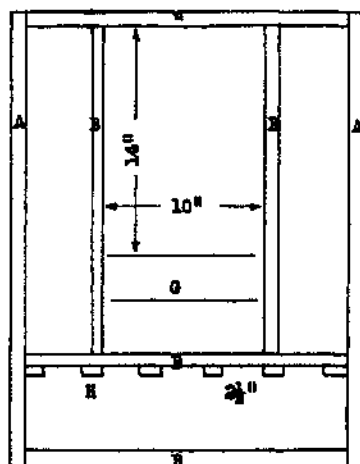
Front View  
Top Removed



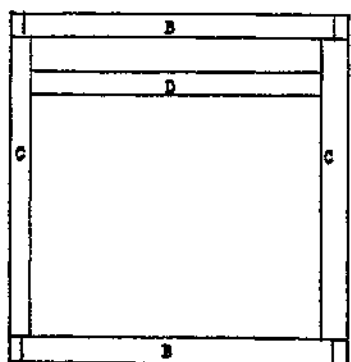
Rear View



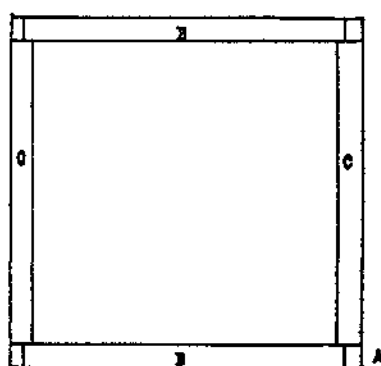
Bottom View



Top View



Back View



Front View

Shipping coop.

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