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## Chick Care: His Life is In your Hands

Boyd A. Ivory

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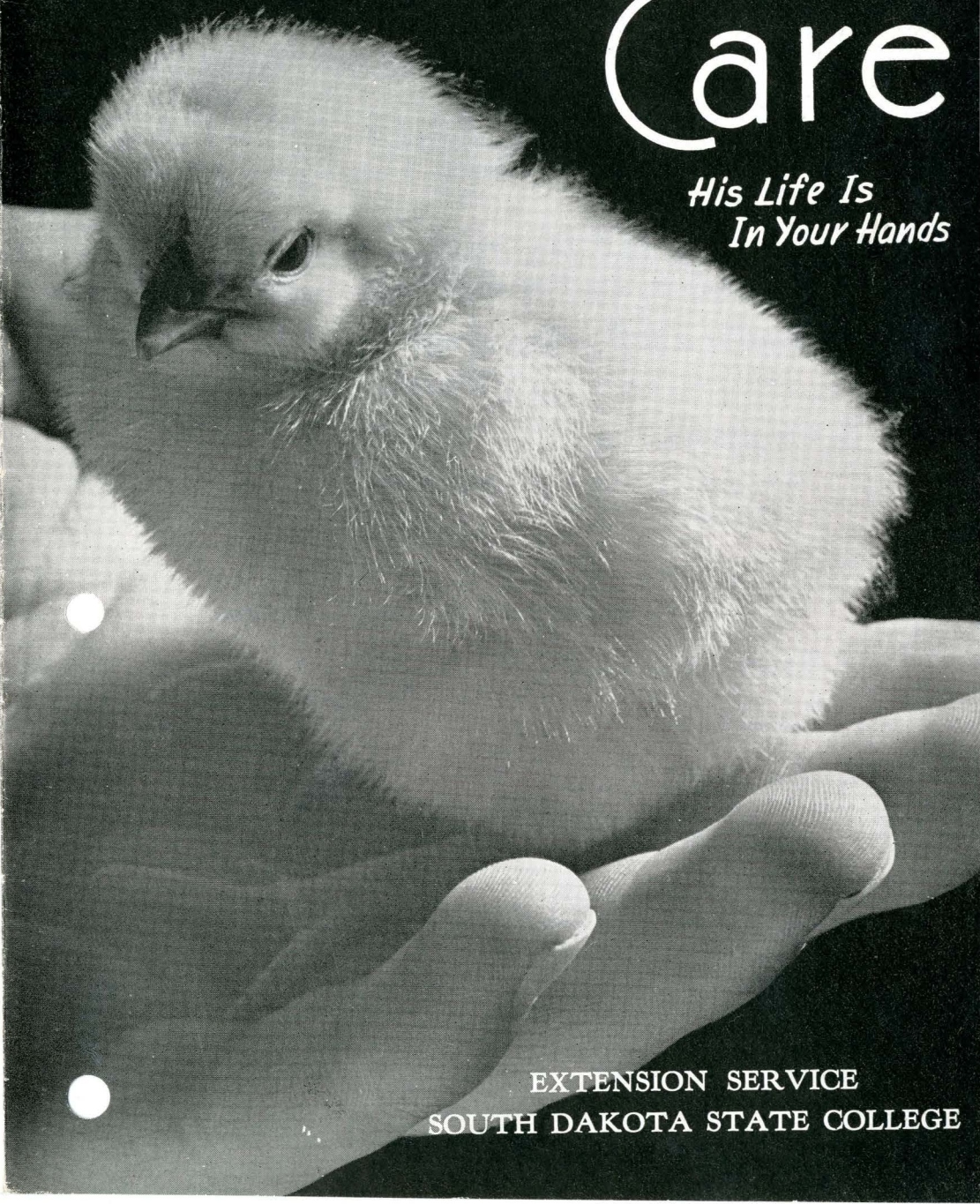
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# Chick Care

*His Life Is  
In Your Hands*



EXTENSION SERVICE  
SOUTH DAKOTA STATE COLLEGE

# *When Brooding Troubles Develop,* **Consider These Possible Sources of Trouble Starters**

- 1. Failure of Chicks to Learn to Eat**  
Death by starvation because chicks did not learn to eat.
- 2. The Feed**  
Unbalanced rations give uneven growth.  
Stale, moldy, or decomposed feed causes digestive disturbances and death.
- 3. Failure to Drink Sufficient Water**  
Plenty of fresh clean water is necessary daily to maintain healthy chicks.
- 4. Insufficient Feeding Space**  
Chicks may starve in the midst of plenty if their feeders are too few.
- 5. Overcrowding**  
Under the hover or in the brooder house causes cannibalism and uneven growth.
- 6. Dampness**  
May lead to pneumonia, coccidiosis, and other diseases.
- 7. Insufficient Heat**  
Check the brooder stove—look at the thermometer—are the chicks comfortable?
- 8. Unsuitable Litter**  
Clean litter helps prevent disease.  
Moldy litter causes diseases.
- 9. Poor Ventilation**  
Under hover and in brooder house—poison gases from brooder stove.
- 10. Disease**  
Have chicks examined by competent authority.

# Chick Care

By BOYD A. IVORY\*

## Brooding Critical Time

The brooding period in many ways is the most critical and difficult period in the management of domestic birds. No poultry business can be successful over a period of time without a practical and efficient layer-replacement program. Chickens must be well grown before they can make a profitable return to their owners regardless of the poultry enterprise in which he is engaged.

One of the most common causes of lost profits and failures in poultry keeping is the lack of knowledge and the ability to carry out a good chick-rearing program. The source of chicks, the time of brooding, and the management of the brooding operations all play an important part in the success of the poultry program. Buying the best chicks available at the right time of the year does not insure success of the poultry program. Likewise, the best care and management cannot make healthy, high-producing pullets out of poor quality chicks. It is necessary to have a combination of the best chicks, the best care and management, and the best feed to produce good healthy pullets that will lay well.

## Use Only the Best Eggs for Incubation

If you are hatching your own eggs, be sure that they come from stock that did not react to the test for pullorum disease (bacterial white diarrhea). Select hatching eggs from those birds that have proved to be good producers.

\* *Extension Poultryman*

## Purchase Quality Chicks From Reliable Hatchery •

If you are buying chicks, buy chicks by the quality of the breeding and disease control methods that have been followed by the hatchery and flock owner who produce the chicks. There are many reliable hatcheries in South Dakota that are continually improving the quality of the baby chicks they sell by following a good breeding program. This means that they are using males to head their flocks that are from U. S. Record of Performance breeders with known egg production and standard bred qualities. They are carrying on a year-around selection program eliminating undesirable breeder hens whenever such individuals are detected. They are following a good program of sanitation and disease eradication.

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

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## Order Chicks Early

Order your chicks early. Hatcheries must plan their operations long before the chicks are delivered. By ordering early, hatchery operators have a chance to select the best breeding flocks, test for disease, and eliminate the undesirable breeders. If orders are crowded during March, April, and May, their heavy hatching season, they may not be able to make the best selection of breeding flocks.

Early-hatched chicks grow more rapidly and feather better. The brooder mortality is lower, and under normal conditions early chicks are the best money-makers. The roasters bring more money because they are sold earlier on a higher market. The pullets mature in time to begin laying eggs early

in the fall when egg prices are usually the highest. It has been shown conclusively that pullets from chicks hatched before the first of May lay a greater number of eggs their first year than pullets hatched after May 1. This is important because early-hatched pullets, in many cases, lay twice as many eggs during the winter months as those hatched after May 1st.

Five and one-half to six months' time is required to develop light breeds, such as Leghorns, to sufficient size to lay well and to lay good sized eggs. About one month longer is required to develop heavier breeds such as Plymouth Rocks, Rhode Island Reds or Wyandottes. A good plan to follow in regard to time of brooding is to start light breeds, such as Leghorns, not later



## National Poultry Improvement Plan Emblem

Only the hatcheries, breeders and flock owners participating in the National Poultry Improvement Plan who are affiliated with the state agency designated by the Bureau of Animal Industry of the U. S. Department of Agriculture, are entitled to use and display this emblem. In South Dakota, the State Poultry Improvement Association is the state agency designated.

the May 15 and to start heavy breeds, such as Plymouth Rocks and Rhode Island Reds, not later than April 15. Chicks hatched later

would not come into production until after November 15. Many would not lay until the following spring.

## Housing

### Brooder House Big Factor in Success

The brooder house is one item of poultry brooding equipment that is very important and should be given consideration in planning the layer-replacement program.

There are many types of structures used for brooder houses, most of which are successful in supplying economical and efficient housing during the brooding period. A complete brooder is simply a special form of house constructed for the purpose of keeping chicks comfortable.

The conditions necessary for successful brooding furnished by a good brooder house are:

- (1) A constant supply of fresh air. (2) Dryness.
- (3) Adequate floor space. (4) The admission of direct sunlight. (5) The ease of disinfection. (6) Sanitation. (7) Protection against chick diseases. (8) Safety from fire.

These conditions in order to be commercial<sup>11</sup> practical, must be reasonably low in cost.

To supply fresh air at all times the brooder must have a good ventilating system. The hover must be so arranged that fresh air can circulate around it without causing drafts. Baffle boards may be used in sliding windows to prevent drafts. Besides providing fresh air, good ventilation also helps to keep the brooder house dry. Chicks cannot grow well in damp quarters. The heat from the brooder stove will keep the floor dry around it but good ventilation is necessary to keep the rest of the floor dry.

Adequate floor space is essential to successful brooding. Overcrowding is one of the greatest brooding evils. Primarily, overcrowding is just mismanagement. Poultry

men should either build a large enough brooder house to supply one-half square foot of breeder space per chick or buy only enough chicks to fill the brooder house, allowing one-half square foot per chick out of the amount of floor space available.

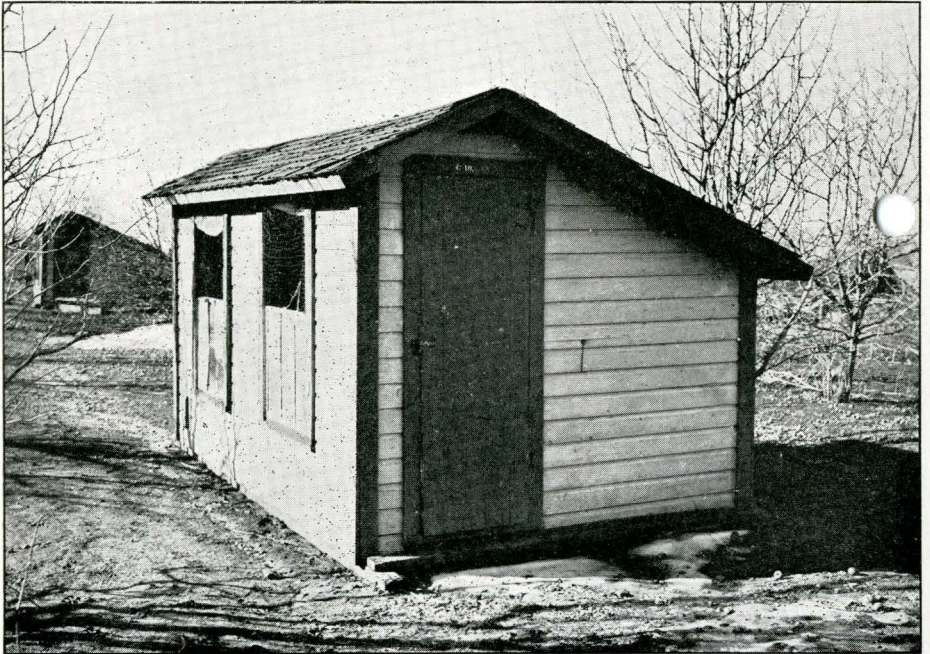
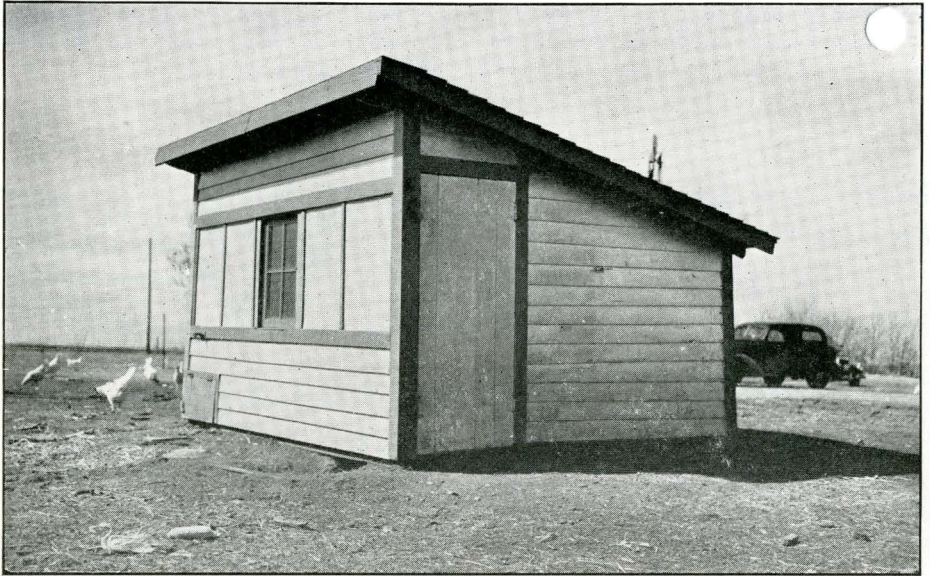
### Sunlight Good Disinfectant

Sunlight is a powerful disinfectant. In addition to keeping the quarters dry, it adds materially to the health and comfort of the chicks. Windows should be placed in front and at both ends of the brooder house. This gives access to sunlight during all of the day.

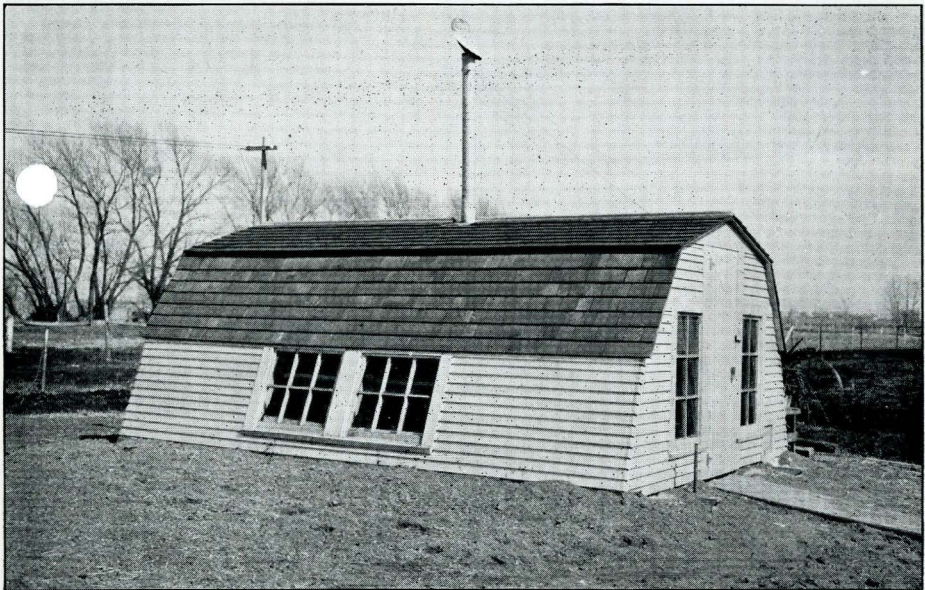
The arrangement of the brooder in the room in which it is placed must be such that permits every crack and crevice to be easily reached with the disinfecting equipment. The brooder house should be thoroughly cleaned and scrubbed, then thoroughly soaked with a good disinfectant before it is used. Most of the diseases common to brooder chicks can be avoided by proper sanitation. Proper sanitation means to begin with the brooder house and other brooder equipment that is clean and free from disease-producing organisms and continue all through the season to maintain clean and sanitary equipment and premises.

It should not be necessary to mention that brooder houses should be tight enough to give protection to the chicks from rats, cats, and other predatory animals.

There is always a fire hazard where artificial heat must be supplied. Care should be taken to reduce this fire hazard wherever possible.



Simple in construction, these brooder houses have proved satisfactory on South Dakota farms. Blue print plans for their construction may be obtained through County Extension offices or the State College Department of Agricultural Engineering department.



These brooder houses provide more floor space and conserve heat. Their construction is more difficult and it may be necessary to purchase them ready-made.



## Interior Brooding Equipment

The equipment necessary for successful artificial brooding of baby chicks consists of:

(1) The brooder unit. (2) The feeding and watering unit. (3) The roosting unit.

### The Brooder Stove

Many different types of brooder stoves are being used successfully. Care and judgment should be exercised in selecting the heating unit for the brooder house. The choice of the type of brooder should be covered by:

(1) Its capacity for generating heat with relative efficiency. (2) Its dependability. (3) Cost and availability of the kind of fuel to be used. (4) Its size.

Any heater used for brooding chicks should furnish enough heat to keep the

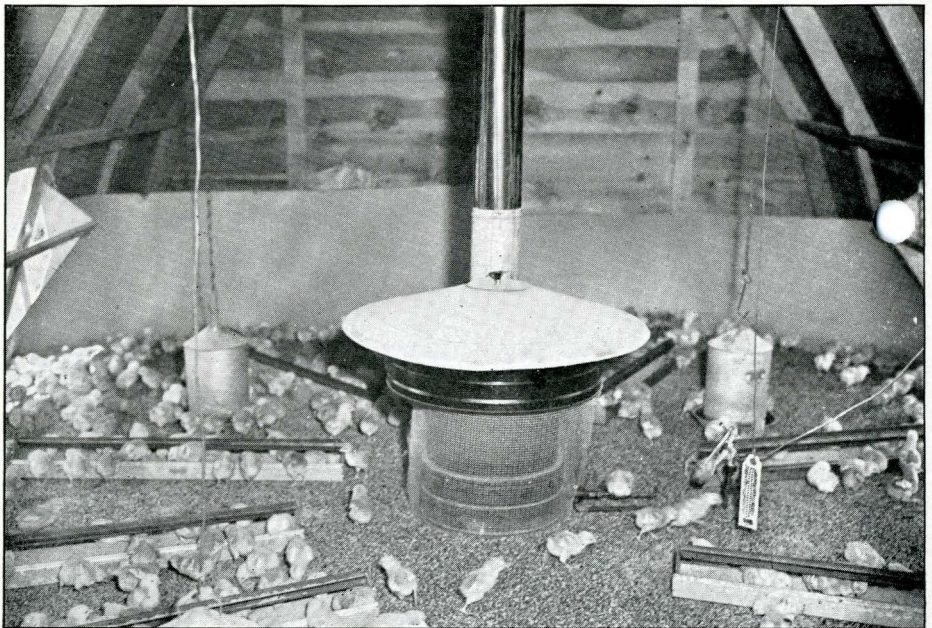
chicks comfortable at all times regardless of the weather conditions.

Dependability is one feature that poultrymen can ill afford to overlook. Unreliable brooder stoves require more frequent attention and are a constant source of worry to the operator. Unreliable heaters also present a more dangerous fire hazard.

Kind of fuel that is most easily obtained and the most economical will influence one's choice of brooder stove.

The size of the brooder stove should be based on the size of each individual poultryman's brooding plant.

Brooder stoves are frequently over-rated on their chick capacity. A good plan to follow is to provide a brooder hover 50-60 inches in diameter for 300 chicks. The usual



Place feeders and water fountains where they may be used without interfering with free movement to and from the brooder stove.

alled 500 chick size will meet this requirement and should be used in the 10 x 14 or 12 x 12 brooder house.

Chicks should have 7 square inches of

space underneath the hover when using coal or oil burning brooders. If an electric brooder is used, it is advisable to provide 10 square inches of space underneath the hover.

## Feeding and Watering Equipment

Baby chicks do not require complicated or expensive feeding or watering equipment. Home-made equipment is just as satisfactory as the more expensive equipment. Feed hoppers should be so constructed that they keep available clean feed which is easily accessible to the chicks. The hoppers should be filled only half full. Chicks will "bill out" a lot of feed that is wasted, and feed spilled on the floor is a good way to spread disease. The hoppers should be convenient for the poultryman to perform his daily poultry chores.

Do not make the mistake of crowding chicks at feed hoppers, for then only the stronger chicks will be able to obtain feed. Be sure to have enough feeding space so that three-fourths of the chicks can be fed at one time. One foot of feeder space accessible on both sides should be supplied for twelve chicks.

### Outgrow Feeders Rapidly

Chicks grow and develop rapidly. Small feeders that meet the chicks' requirements the first two or three weeks will not be

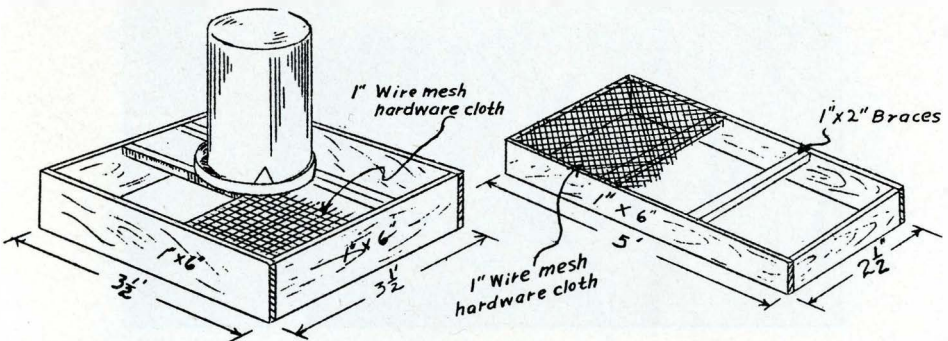
satisfactory after the chicks have outgrown them. It is necessary to supply larger feed hoppers as the chicks grow.

It is a good plan to use screen platforms for feeders and water fountains. Droppings accumulate around feeders and water fountains. These platforms help to prevent the chicks from coming in contact with this filth. The litter should be cleaned underneath these platforms at frequent intervals.

Plans for feed hoppers can be obtained from your County Extension Agent or from the Extension Service.

A deep pan in which is set a can of appropriate size as a guard makes a very good home-made watering device for starting the chicks.

Since water is the cheapest kind of food chicks should be supplied with an abundance of it. They will not drink all that is necessary to maintain good health if it is dirty, polluted, or stale. At least one drinking vessel with a capacity of four quarts should be provided with clean fresh water for each 100 chicks.



Provide screen platforms for feeders and water fountains.

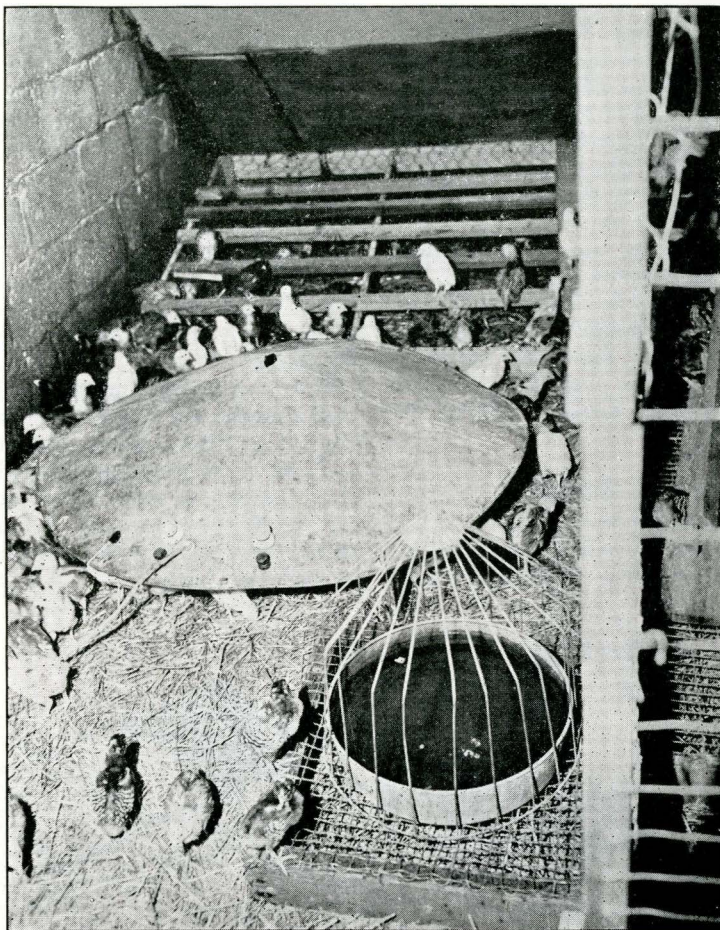
### Encourage Early Roosting

As a rule, chicks get better ventilation and grow and develop more rapidly when they begin roosting early. The coldest and foulest air is down on the floor; so it is desirable to get the chicks up on the roosts as soon as possible.

The age at which chicks will begin roosting depends on their growth and development and, to a considerable extent, on the

weather conditions. Some flocks develop more slowly and are more difficult to teach to roost.

Light, portable, and relatively inexpensive roosts should be put in the brooder house when the chicks are three or four weeks old. They should be elevated 4 to 6 inches above the floor and placed near the hover. When using an electric brooder stove, the hover can be placed over the roosts, as shown below.



Teach chicks to roost while the heat is still available.

During the period when the operator is teaching the chicks to roost, they should be watched closely to see their reactions to heat and reduce the temperature under the hover as rapidly as weather conditions will permit. Generally, the heat can be discon-

tinued as soon as all the chicks have been taught to roost.

Be sure to supply enough roosting space. If roosts are overcrowded, some chicks will not learn to roost. Allow 50 feet of roost space for each 100 chicks.

## Brooding Management

### Scrub Thoroughly

In preparing the brooder houses for the chicks, all roosts, feeders, and movable equipment should be taken out. The ceilings and side walls should be swept down and the floors scraped so as to remove all dirt. Next scrub the lower part of the side-walls and the floor with boiling lye water. Some flock owners use a large rendering

kettle for this purpose and heat the water close to the brooder house. It is essential to have the water boiling. One pound of commercial lye to 5½ gallons of water is satisfactory.

It must be kept in mind that disinfectants will not do the work which is intended for hot water and scrub brushes. Disinfectants will kill disease organisms only



Screens for water fountains and feeders will aid sanitation.

when they come directly in contact with them. It is, therefore, a loss of time and material to use a disinfectant on a surface which has not previously been thoroughly cleaned. The house should then be sprayed with a 5 percent solution of disinfectant such as crude carbolic or creolin. Use enough spray to completely wet the entire inside of the house.

### Disinfect All Equipment

Mash hoppers, roosts, and all other equipment which is to be used in the house should be given the same thorough cleaning and disinfecting and allowed to stand in the sun.

It is of utmost importance that this cleaning and disinfecting be done before the house is moved to clean ground. Otherwise, the contamination which is removed from the house would be distributed on the ground where the chicks are to be raised.

The brooder stove should be set up and operated for three days before the chicks arrive in order that the heat may be regulat-

ed and the house thoroughly dried out and warmed up. Any part of the brooder stove that is not functioning properly should be replaced.

A chick's requirement for heat are very high for the first day or two of brooding. The brooder room itself should not be heated to a high temperature. All that is necessary is to heat that portion of the floor where the chicks may spread out and be comfortable.

As soon as the chicks begin to eat well and to exercise more, their heat requirements are reduced quite rapidly. The temperature in all cases should be lowered as fast as the comfort of the chicks will permit. They must appear to be comfortable without heat whenever it is removed. It is best to have the hover a little too warm than too cold. Chicks can and will move away from heat, but they tend to crowd and pile if it is too cold.

An experienced poultryman can determine the correct temperature by the reaction of the chicks; but it is advisable to use a thermometer especially if one has had no experience in brooding chicks.

### Recommended Brooder Temperatures

Hover temperature under edge of hover and 2 inches from floor		Room temperature
1st week	95°—100°F.	70°—75°F.
2nd week	90°—95°F.	70°—75°F.
3rd week	85°—90°F.	70°—75°F.
4th week	80°—85°F.	70°—75°F.

### Prevent Crowding

One of the big factors in chick losses is the result of crowding. This tendency of chicks to crowd in corners or along the wall is usually the result of mismanagement. Instinctively chicks will huddle in groups whenever they become uncomfortable, frightened, or disturbed. They have a tendency to pile into corners when they are subjected to excessive heat or when they become chilled.

Crowding can usually be prevented by maintaining the proper temperature, teaching the chicks to roost early, and rounding the corners in the brooder house. The operator should be cautious when entering the brooder house to avoid frightening the chicks.

### Do Not Overcrowd The Brooding Equipment

One of the most common mistakes made in brooding is to put more chicks in the

brooder house than can be handled on the amount of floor space available. Chicks need room. Room to eat and drink, room to grow, room to sleep. The University of

California has collected some interesting data on the relation of floor space to mortality of chicks. The table summarizes the results.

### Relation of Floor Space and Mortality of Chicks

Floor space per 100 chicks	No. of chicks	No. of deaths	% mortality to 3 mos. of age
35 square feet or less	73,077	19,257	26.3
35 to 50 square feet	25,371	4,122	16.2
50 square feet or more	25,044	3,484	13.1

It can be assumed that where the percent of mortality is high, a larger percentage of the chicks that do live fail to develop into good healthy high-producing pullets. When chicks are stunted during the brooding per-

iod, whether it be from poor feeds, overcrowding, disease, or any other cause, the effects are carried throughout the life of the fowl.

## Clean Feeding of a Complete Ration

### Feed Before 72 Hours Old

Most hatcheries keep the chicks in their incubator until they are 12 to 24 hours old. Feed should be available for the chicks when they are 36 hours old, although there is not any danger of starvation until the chicks are 72 hours old. It is, therefore, advisable to have the feed accessible as soon as the chicks arrive at the brooder house.

All feed should be fed to the chicks in troughs or hoppers. The first day, old newspapers, egg case flats, or such material may be placed on the floor with feed. This provides a place where all chicks can get a good start. These papers should be changed frequently. Discontinue the use of papers and flats as soon as the chicks have learned to use feed hoppers. If feed is scattered in the litter, the chicks will pick up feed from the litter and they also pick up disease organisms from the filth of the contaminated litter.

A ration must be well balanced and complete if satisfactory growth and best results from the mature pullets are to be secured. A pullet once stunted because of malnutrition will never produce as well as if she had been properly raised.

### Disease Lives in Soil

Soil on which no poultry has ranged or where there has been no poultry manure spread for a period of at least two years is considered clean for the purpose of rearing chicks. Poultry disease organisms and the eggs of intestinal parasites carry over in the soil; hence the importance of getting the chicks on soil which is free from this infestation. Land which has been used for brooding chicks should be broken up and cropped and reseeded before it is again used for chick rearing. Chick range should be rotated with a good crop rotation. Clover or alfalfa sod or a good blue-grass is ideal for rearing chicks.

The use of a portable brooder house makes it possible to range the chicks on clean ground. This location should be on land that is not wet or water-logged, free of drainage from contaminated areas, and far enough away from other poultry yards, barns, and corrals, to reduce infection from these sources.

Coccidiosis and round worms are the two most common parasites which are known to be spread by contaminated soil.

## Chick Feeding

There are two important angles to chick feeding. One is the ration itself; the other is the method of feeding. There are many satisfactory rations that will give satisfactory growth. The two rations following have been tested under practical conditions and have proved very satisfactory. Oats, wheat, sorghums and corn are good scratch grains.

Starting Mash (19% Protein) Day old to eight weeks		Growing Mash for Birds on Range	
Ingredient	Pct. or Lbs.	Ingredient	Pct. or Lbs.
Yellow corn	40	Ground yellow corn	44
Wheat, ground coarsely	30	Ground wheat	30
Soybean oil meal	10	Meat and bone scraps	6
Meat and bone scraps	5	Soybean meal	7
Alfalfa leaf meal	5	Alfalfa meal	5
(a) Dried milk or dried distillers' grain with solubles	6	Dried milk or dried distillers' grain	4
(b) Fish oil	1	Ground limestone	1.5
(c) Salt mixture	1	Salt	0.5
Ground limestone	2	Fish oil*	2
Total	100	Total	100

\* To be used when the birds are confined.

(a) If sufficient skimmed milk is available so that it can be left in front of chicks at all times, the dried buttermilk in the mash can be replaced with ground yellow corn in either of the rations.

(b) Only standard fish oil tested and guaranteed for Vitamin D potency should be used and the oil well mixed with the mash. (Standard oil contains at least 85 U S P Units Vitamin D per gram). If a fish oil concentrate is used, less will be required. Cod liver oil must be supplied as long as the chicks are confined to the brooder house. As soon as they are allowed access to direct sunlight (not through window glass) the cod

liver oil may be omitted from the ration.

(c) One ounce of manganese sulphate or one-half ounce of manganese dioxide should be added to each 500 pounds of mixture. This may be added to the salt and carefully mixed and screened in order to break up any lumps which may occur. If chicks are started on solid floors of brooder houses, there appears to be less danger of "slip tendons."

The wheat used in chick rations should be coarsely ground, otherwise the feed may stick or gum in the chick's mouth.

## Management of the Pullets

### Sell Cockerels Early

As a general rule it is more profitable to dispose of all cockerels as roasters at four to six pounds if a lot of farm grains are available. Cockerels develop more rapidly than the pullets and both will grow better when kept in separate pens, because more room is provided in each case. It is a good

plan to separate pullets and cockerels as soon as they are large enough to determine their sex.

The best pullets are raised where an abundance of clean range is available. Growing pullets should be provided with large roomy houses which will give them a comfortable place to stay at night and during stormy weather. It should be remembered that pul-

require more space as they mature, and the house or roosting place should be large enough to provide for the increased requirement of the pullets as they grow larger in size.

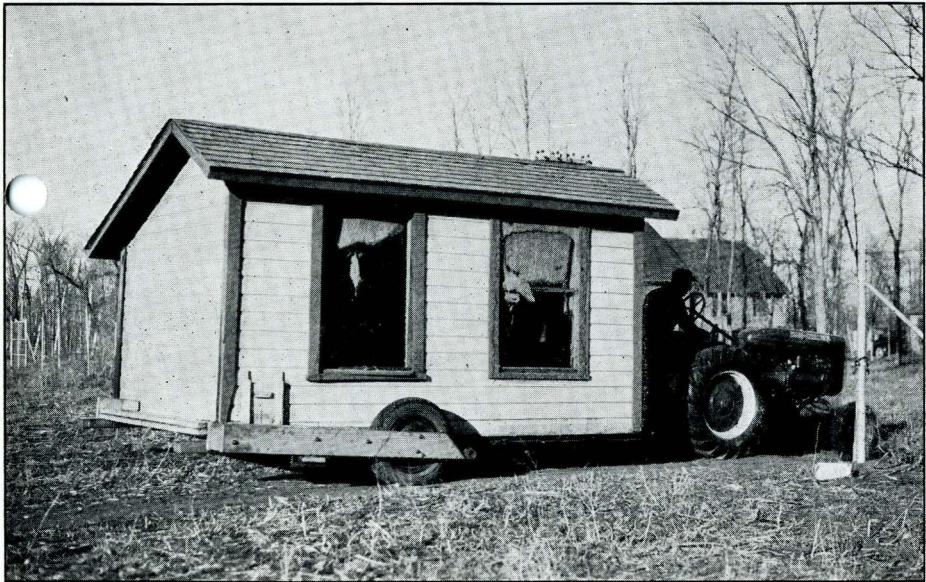
Shade is necessary for the protection of pullets during hot weather. If housing is scarce, range shelters may be economically constructed. Small trees may also be cut and covered with burlap. The shade or shelter should be movable to prevent contamination of the soil by an accumulation of droppings.

Water should be supplied in abundance. Developing pullets drink much and require plenty of water to make rapid growth. Some means of shade must be provided to keep the water cool during the hot afternoons.

### Poultry Pasture Necessary

As soon as weather conditions will permit, the chicks should have access to a good clean, green range. With an abundant supply of good green feed available at all times, the amount of mash and grain consumed will be reduced. The birds will be healthier and there will be less trouble with cannibalism.

Several different grasses and cereal grains may be used for range with equally good results. In the early spring, either rye or oats may be planted. Later in the spring, sudan grass, and rape may be planted, and they will do well under relatively dry conditions if they get a good start. Sweet clover and alfalfa make an excellent poultry range, but they are best utilized the following year after planting.



Move the brooder house to clean range every year after it has been cleaned and disinfected. Blue print plans to build this handy building-mover may be obtained from the State College Department of Agricultural Engineering.



# Baby Chick Care Specifications

## FROM DAY OLD TO END OF EIGHT WEEKS

IF YOU RAISE	100	200	300	400	500
	Chicks	Chicks	Chicks	Chicks	Chicks
	<b>Recommended Unit</b>				
1. <b>Feed</b> (20% protein mash) in pounds).....	400*	800	1200	1600	2000
2. <b>Feeders</b> —No. of feet.....	8	16	24	32	40
No. of 4 ft. feeders.....	2	4	6	8	10
3. <b>Housing space</b> in sq. ft.....	48	80	120	144	168
Probable size of brooder house.....	6x8	8x10	10x12	12x12	12x14
4. <b>Water fountains</b> , capacity in quarts.....	4	8	12	16	20
5. <b>Size of brooder</b> (Diameter of hover in inches).....	32	42	52	56	60
6. <b>Litter</b> (Expressed in pounds) required for one cleaning—Straw.....	50	100	150	200	250
Shavings.....	67	133	200	267	333
Peat Moss.....	50	100	150	200	250
7. <b>Roosting space</b> , in linear feet.....	50	100	150	200	250

\* All amounts given are the least possible; to have less means the chicks will suffer.



An ideal pullet range provides an abundance of green feed, shade for comfort and a clean place in which to grow. (This photograph through the courtesy of the University of Wisconsin Agricultural Extension Service.)

**Acknowledgment:** The writings of M. H. Simonson, former Extension Poultryman now with the U. S. Army, were of assistance in preparing this publication.