Rearing Chicks Successfully

R. M. Sherwood

Iowa State College

Follow this and additional works at: http://lib.dr.iastate.edu/iaes_circulars
Part of the Agriculture Commons, and the Poultry or Avian Science Commons

Recommended Citation
http://lib.dr.iastate.edu/iaes_circulars/14
Rearing Chicks Successfully

Abstract
Rearing chicks has its serious problems, but the young brood may be brought successfully through the first six or eight weeks if these essentials are followed:

1. Give chicks a good start by selecting strong, vigorous, well-matured breeding stock that is free from disease and has been properly housed and fed, and by properly Incubating the eggs from the stock.
2. Make sure that hens used for brooding are free from lice and mites before the chicks are placed with them.
3. If an artificial brooder is used, make sure That it will provide ample heat without danger of fire, That It gives the chicks a chance to get away from the heat when they want to, That it has a capacity large enough, That It Is economical In Its cost and in the fuel it uses.
4. Remove dead chicks promptly from the brooder and bury them deeply or burn them.
5. Mark all weak chicks so that they will never be used as breeders.
6. Clean the brooder and disinfect it each time before it Is used and oftener If disease breaks out in flock.
7. Do not feed chicks until they are from 48 to 60 hours old, and then only limited amounts of easily digested food for the first week.
8. Use only clean and wholesome food and feed it only in clean dishes and litter.
9. Provide a variety of feeds. They should contain enough of protein and ash. Ground bone furnishes ample ash and some protein; skimmed milk and buttermilk furnish abundant protein.

Keywords
Poultry Husbandry

Disciplines
Agriculture | Poultry or Avian Science
REARING CHICKS SUCCESSFULLY

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND THE MECHANIC ARTS

Poultry Section

Ames, Iowa
OFFICERS AND STAFF

IOWA AGRICULTURAL EXPERIMENT STATION

STATE BOARD OF EDUCATION.

Hon. D. D. Murphy, Elkader.
Hon. A. B. Funk, Spirit Lake.
Hon. George T. Baker, Davenport.
Hon. Charles R. Brenton, Dallas Center.
Hon. E. P. Schoentgen, Council Bluffs.
Hon. Parker K. Holbrook, Onawa.
Hon. Roger Leavitt, Cedar Falls.

OFFICERS.

Hon. D. D. Murphy, Elkader..............................President
Hon. W. H. Gemmill, Carroll..............................Secretary

FINANCE COMMITTEE.

Hon. W. R. Boyd, President, Cedar Rapids.
Hon. Thos. Lambert, Sabula.
Hon. W. H. Gemmill, Carroll.

AGRICULTURAL EXPERIMENT STATION STAFF.

Raymond A. Pearson, M. S. A., LL. D., President.
C. F. Curtiss, M. S. A., D. S., Director.
W. H. Stevenson, A. B., B. S. A., Vice Director.
J. B. Davidson, B. S., M. E., Chief in Agricultural Engineering.
Arthur W. Griffin, Assistant Chief in Agricultural Engineering.
H. D. Hughes, B. S., M. S. A., Chief in Farm Crops.
L. C. Burnett, M. S. A., Assistant Chief in Cereal Breeding.
P. E. Brown, B. S., A. M., Ph. D., Assistant Chief in Soil Bacteriology.
John Buchanan, B. S. A., Superintendent of Co-operative Experiments.
I. S. Potter, A. B., M. S., Ph. D., Assistant in Soil Chemistry.
L. W. Forman, B. S., M. S., Assistant in Soils.
Charles R. Forest, Field Superintendent.
E. H. Kellogg, B. S., Assistant in Soil Chemistry.
Robt. Snyder, B. S., Assistant in Soil Chemistry.
John M. Evvard, M. S., Assistant Chief in Animal Husbandry.
H. H. Kildee, B. S. A., Assistant Chief in Dairy Husbandry.
Russell G. Dunn, B. S., Assistant in Animal Husbandry.
R. E. Buchanan, M. S., Ph. D., Chief in Bacteriology, Associate in Dairy and Soil Bacteriology.
L. H. Fammel, B. Agr., M. S., Ph. D., Chief in Botany.
Charlotte M. King, Assistant Chief in Botany.
Harriette Kellogg, A. M., Assistant in Botany.
A. W. Dox, B. S., A. M., Ph. D., Chief in Chemistry.
W. G. Gaessler, B. S., Assistant Chief in Chemistry.
R. E. Neldig, M. S., Assistant Chief in Chemistry.
S. C. Guernsey, B. S. A., M. S. K., Assistant in Horticulture.
Philip S. Blumenthal, M. S., Ph. D., Assistant in Chemistry.
J. W. Bowen, A. M., Assistant in Chemistry.
M. Mortensen, B. S. A., Chief in Dairying.
B. W. Hammer, B. S. A., Assistant Chief in Dairy Bacteriology.
Geo. S. Tilley, A. B. S., Assistant Chief in Dairy Experimental Work.
H. E. Summers, B. S., Chief in Entomology.
R. L. Webster, A. B., Assistant Chief in Entomology.
S. A. Beach, B. S. A., M. S. A., Chief in Horticulture and Forestry.
Laurens Greene, B. S. A., M. S. A., Assistant Chief in Pomology.
A. T. Erwin, M. S., Assistant Chief in Truck Crops.
G. B. Macdonald, B. S. F., Assistant Chief in Forestry.
J. H. Allison, Assistant in Plant Introduction.
T. J. Maney, Assistant in Horticulture.
C. H. Stanke, D. V. M., Chief in Veterinary Meldicine.
F. W. Beckman, Ph. B., Bulletin Editor.
F. E. Colburn, Photographer.
REARING CHICKS SUCCESSFULLY

By R. M. Sherwood.

Rearing chicks has its serious problems, but the young brood may be brought successfully through the first six or eight weeks if these essentials are followed:

1.—Give chicks a good start by selecting strong, vigorous, well-matured breeding stock that is free from disease and has been properly housed and fed, and by properly incubating the eggs from the stock.

2.—Make sure that hens used for brooding are free from lice and mites before the chicks are placed with them.

3.—If an artificial brooder is used, make sure
   That it will provide ample heat without danger of fire,
   That it gives the chicks a chance to get away from the heat when they want to,
   That it has a capacity large enough,
   That it is economical in its cost and in the fuel it uses.

4.—Remove dead chicks promptly from the brooder and bury them deeply or burn them.

5.—Mark all weak chicks so that they will never be used as breeders.

6.—Clean the brooder and disinfect it each time before it is used and oftener if disease breaks out in flock.

7.—Do not feed chicks until they are from 48 to 60 hours old, and then only limited amounts of easily digested food for the first week.

8.—Use only clean and wholesome food and feed it only in clean dishes and litter.

9.—Provide a variety of feeds. They should contain enough of protein and ash. Ground bone furnishes ample ash and some protein; skimmed milk and buttermilk furnish abundant protein.

MANAGEMENT BEFORE THE CHICK IS HATCHED.

The greatest success in rearing chickens comes only when proper methods are adopted, even before the chick is placed in the brooder or out with the hen. It is generally conceded that factors which lower the per cent of the hatch will also lower the strength of the chicks which hatch.

The breeding stock should be strong, vigorous and well matured. The hens must be properly mated, housed and fed, and be given every condition that will induce them to lay eggs which will produce strong

*Assistant Professor of Poultry Husbandry.
chicks. They should be free from disease. In some eastern states a
heavy loss of chicks is caused by bacillary white diarrhoea. It has been
found that this disease may come to the chicks from the hens in the
breeding flock.** If a female chick recovers from the acute form of this
disease and matures, its ovary will carry the infection and the chicks
produced from the eggs laid by such 'hens will have the disease. Thus
the trouble may go from hen to egg, from egg to chick, from chick to
pullet, and so on, generation after generation.

For the first four or five days after the chicks are hatched the acute
form of bacillary white diarrhoea is very readily transmitted from one
chick to another. After this time it is less readily transmitted, but there is
good evidence that it is still contagious and the adult stock may become
infected and transmit the disease at least through the female line, as
previously noted. It is probable that this disease is not very common in
Iowa; it is important, however, in buying eggs or chicks to know that
they are free from it. It is a good plan to note the ovaries of the hens
that die or are killed on the farm, because ovaries that are distinctly
abnormal in appearance are always found in hens that carry the in-
fec
A great loss in chicks is also often due to poor incubation and
handling of eggs before incubation. The moisture content of the in-
cubator is of almost as much importance as the temperature. At
hatching time great care is necessary not to allow the chicks to be-
come chilled. The temperature of the nursery chamber in many incu-
bators is several degrees cooler than the egg tray, and for this reason
the chicks should not be allowed to drop down to the nursery cham-
ber until they are thoroughly dry. A wet chick chills much more
readily than a dry one. If a chick becomes chilled, bowel trouble
is almost sure to follow, and with that great loss results.

Lice and mites are the cause of a great loss in hen hatched and hen
brooded chicks. To reduce this loss the sitting hens should be thor-
oughly dusted at the beginning of each week of the incubation period
with a good louse powder. A good powder may be made at home as
follows:

Three parts gasoline, 1 part commercial
cresol. Add to the mixture of these liquids
as much plaster of paris or land plaster as
the mixture will moisten. Allow to dry.

To use this powder, apply liberally to the hen, especially around
the vent, under the wings and the breast. It is much simpler to re-
duce the number of parasites on the hen than to have to work with
all the chicks. This powder is too severe for young chicks.

EQUIPMENT FOR ARTIFICIAL BROODING.

One of the first essentials for a good brooder is that it will at any
time give a temperature under the hover of 95° to 100° without danger

**Storrs Experiment Station, Storrs, Conn.
of fire. A large number of the brooders on the market are not capable of doing this in the early spring months unless they are in buildings with some auxiliary heating system. As chicks are injured by being overheated as well as by being chilled, there should be some provision made so that the chicks may get away from the heat if they are too warm. Such a hover makes it possible to keep the chicks warm during cold nights without overheating them, for they may get far from the heater in the warmer evening and nearer to it as the night gets colder.

In building the brooder house care should be taken to have ventilation without much circulation of air near the floor. Provision is also necessary for admitting an ample supply of sunlight as it helps to keep the house free from disease and makes the chicks contented.

The house and brooder should be large enough so that the flock will not be crowded. It is common to recommend more chicks for a brooder than should be kept in it. Large colony houses have several advantages over small outdoor brooders; they are not so quickly affected by outside conditions; they do not cool off so quickly if the door is opened, and they may be used for other stock when not needed for brooding. The most satisfactory house is one in which the work may be
conveniently done and preferably one large enough for the caretaker to enter. The matter of convenience is important to consider in selecting a brooder also. Ready access to the floor should be provided so that it may be easily kept in good condition.

Of the brooder houses used at the Iowa State College poultry farm, the 8x10 foot house with a double pitch roof, as shown in figure 1, is one of the most efficient. It is large enough and so constructed that when not used for a brooder house it is very satisfactory for hens, cockerels and capons. It gives ample floor space for 200 chicks, it has openings enough at the front for sunlight and ventilation without drafts. It is convenient and is not affected by climatic conditions as are the small outside brooders.

The illustration shows these openings. They may be closed by glass windows or by frames covered with muslin. The openings are all the same size and thus the glass or muslin may be shifted from one open-

Fig. 2. The Cornell brooder-heater.
Fig. 3. Cornell brooder with hover raised.

Fig. 4. Cornell brooder with hover down, showing device to keep chicks close to the hover.
A brooder which has proven very satisfactory and which has a true capacity of 200 chicks is the one worked out by Cornell University.* It is a non-patented heater and for this reason may be made by any one. The fuel used is gasoline. The advantage of this heater is that the troublesome wick is done away with. The flame is regulated by means of a metal valve and the entire heating device is metal so that the danger of fire is largely eliminated. Other advantages of this gasoline brooder, aside from being safe, are that it cares for a sufficiently large number of chicks to economize fuel and labor, that it will keep the chicks warm in rather severe spring weather, that it is easily operated and regulated, that the hover is large enough so that the chicks may get away from the heat when desirable, and that it is convenient.

Fig. 2 shows the brooder heater furnished by the manufacturer. The burner box and radiator are set up to show the way in which they are connected when in use. Fig. 3 shows the heater installed with the hover raised to show the arrangement of the different parts; note the position of the gasoline tank. Fig. 4 shows the hover in position for brooding, also the device used to keep the chicks near the brooder until they have learned to go under the hover. This device may gradually be moved farther from the brooder and finally taken away altogether. The side of this device nearest the brooder is made at right angles with the floor while the one on the outside slopes so that any chick that should get over may easily get back.

GENERAL MANAGEMENT FOR ARTIFICIAL BROODING.

It is important that finely chopped litter be placed on the floor or the brooding house as well as a liberal supply under the hover to protect the chicks from the cold floor. The brooder should be started long enough before the chicks are to be placed in it to warm and dry out the hover and litter and to enable the operator to become sufficiently familiar with its operation to regulate the temperature properly. The temperature should be from 95° to 100° for the first week and then gradually decreased as the chicks grow older and the season advances. It is impossible to say how fast to lower the temperature except to notice the chicks. At night, if the temperature is correct, the chicks will be spread out asleep on the floor under the hover. If it is too cold they will be crowding together and chirping.

Whenever caring for the chicks, the operator should look under the hover to find and remove any dead chicks or any which may be sick. All dead chicks should be burned or buried deeply and the sick or weak ones should either be killed or taken away from the others. Should they recover, they should be marked and never used as breeders. As soon as the sex may be distinguished, mark the weak pullets and the strong, vigorous cockerels. Send the weak pullets to market and use only the strong cockerels for breeders. It is easier

*Sold by Treman, King & Co., Ithaca, N. Y.
to judge the strength and vigor of chicks when compared only with those of the same age than when a number of ages are together.

Thoroughly clean the brooder and brooder house and disinfect them each time before chicks are placed in them. If a disease is known to have been present the brooder and house should be thoroughly scrubbed and allowed to dry before being disinfected. A strong mixture of almost any of the coal tar dips is satisfactory for disinfection, or a home made disinfectant may be made as follows:

Shave 1 ten cent cake of laundry soap into 1 pint of soft water. Heat or allow to stand until soap paste is formed. Stir in 1 pint of commercial cresol and heat or allow to stand until the soap paste is dissolved. Stir in 1 gallon of kerosene. This may be used diluted with 10 to 50 gallons of water.

EQUIPMENT AND MANAGEMENT FOR NATURAL BROODING.

A considerable amount of labor and trouble may be saved by hatching at one time as large a proportion of the chicks as it is intended to raise as is practical. Almost always more chicks may be brooded by a hen than she will hatch at one time; thus some of the hens that were used for incubating may be reset or returned to the laying flock. Chicks of different ages must be kept separate if best results are to be attained.

When chicks are brooded with hens, small coops are desirable. Almost any of the small coops seen on farms are very satisfactory for confining the hen when the chicks are to be allowed their liberty. A good coop for hens may be made by covering a framework made of strips or waste lumber with a good grade of roofing paper. It is often necessary to keep the chicks confined during rainy weather or in the morning when the grass is wet. For this purpose a coop with a pen similar to the one shown in figure 5 is very satisfactory.
When the chicks are running at large the pen may be set on blocks or bricks and be used to feed the small chicks and exclude the larger ones.

**CHICK FEEDS.**

Every food used in a ration for chicks should be clean and wholesome. The feeding of musty grains or tainted meat feeds results in serious bowel troubles. Tainted feeds may be detected more readily by holding them tightly in the hand for a short time until they become warm. If a putrid or decayed odor is found in meat feeds they should not be used; however, a cooked or burned meat odor is present in a good grade of this product.

The cost of the ration is important in all animal feeding. It is, however, least important in chick feeding, for only a small amount of food is required to bring chicks through the brooding period.

The chick ration should contain a variety of feeds and be made up of cracked grains, ground grains or mill feeds, animal feeds, green feeds and mineral feeds. The kinds of cracked grains and ground feeds selected will depend upon their availability and price. In Iowa, where corn is one of the cheapest feeds, it should make up a large part of the ration. This feed must be supplemented by feeds rich in protein and ash. High grade meat meal, beef scrap, sour skimmed milk, buttermilk, and infertile eggs, tested from the incubator, are rich in protein. Although it is commonly recommended to hard boil the eggs to be used in chick feeds, such a practice makes the eggs less readily digested. Raw eggs are fed at this college with very good results. If bacillary white diarrhea was known to be present, the eggs should be boiled to kill any germs they may contain. Sour skimmed milk and buttermilk can advantageously be used to make the moist mash as well as for drink. This, however, will not take the place of water, which should always be provided. Although meat feeds, milk and eggs are rich in ash, ground bone should also be provided.

For the necessary green or succulent feed, young clover or alfalfa are excellent. Sprouted oats may be fed if the above feeds are not available. Some poultrymen plant lettuce for chicks.

The ground grains or mill feeds should be combined in such proportions that the ration will be crumbly and not sticky or pasty. A sticky or pasty ration is not easily digested and also causes disorders of the digestive tract.

No one ration can be recommended as the best for all conditions. The following two are submitted, one of which proved satisfactory in experiments at Cornell University and the other is used with success at Iowa State Experiment Station. Either may be used advantageously when the ingredients are all available. In other cases substitutions may be made:
RATION I.

CRACKED GRAIN.

First four weeks.  
Cracked wheat 3 parts  
Finely cracked corn 2 parts  
Pin head oat meal 1 part  
Fed twice a day.

For later feeding.  
Whole wheat 3 parts  
Coarsely cracked corn 2 parts  
Hulled oats 1 part

GROUND FOOD.

First four weeks.  
Wheat bran 7 parts  
Alfalfa meal 2  
Corn meal 3  
Wheat middlings 3  
Sifted beef scrap 4  
Ground bone 1  
The ground food is moistened with skimmed milk and fed three times a day at the start and decreased as the chicks grow older. Beef scrap is hopper fed at all times.

For later feeding.  
Wheat bran 3  
Alfalfa meal 3  
Corn meal 3  
Wheat middlings 3  
Beef scrap 4  
Ground bone 1

RATION II.

CRACKED GRAINS.

Grain ration ‘A’ fed first 8 weeks.  
Cracked corn 2  
Cracked wheat 1  
Steel cut oat meal 1  
Fed twice daily in litter from one to six inches deep.

Grain ration ‘B’ fed after the 8th week.  
Coarsely cracked corn 2  
Wheat 1  
Oats 1

GROUND FEED.

Mash ration ‘C’ fed first two weeks.  
Stale bread 3  
Oat meal 3  
Eggs (tested from incubator) 4  
Bran 1½  
Corn meal 1½  
Ground bone ½  
Corn meal 3  
Wheat middlings or high grade shorts 2  
Wheat bran 1  
Beef scrap 1  
Ground oats 1  
Ground bone ½  
Salt 1/10

Ground feed made moist with sour milk and beef scrap or meat meal fed in hoppers.

SYSTEM OF FEEDING.

While the chick is developing in the egg only about one-fourth of the yolk is used; the remaining three-fourths is taken into the abdomen of the chick just before it hatches. This is sufficient material to maintain the life of the chick for a number of days. It is thought that too early feeding is often the cause of a failure of the chick to
properly absorb this material and a consequent derangement of the digestive system. Dr. F. P. Shaw, who has made an extensive investigation of this subject, says, "That the digestive functions of the stomach (of the chick) are developed by the second day after hatching, whereas the pancreatic ferments are improperly developed before the seventh." The finding of Dr. Shaw explains the common practice of not giving chicks feed until two days old and then only giving them limited amounts of easily digested foods for the first week.

The following is the method of feeding used at this college: The chicks are generally taken to the brooder when 24 to 36 hours old or the first morning after all are hatched and thoroughly dried off. They may be given water, with the chill removed, and limited amounts of bone, charcoal and grit. Shaw says that grit, aside from aiding in grinding, also stimulates the muscular action of the gizzard, especially when large amounts of soft feeds are given. We can therefore see a double reason why grit should be supplied at all times.

After the chicks are 48 to 60 hours old they are given limited amounts of moist mash "C" and cracked grains, mixture "A". They are given no more than they will clean up in 10 or 15 minutes, but are fed moist mash five times a day for the first three or four days then reduced to four feeds, and at the end of the first week reduced to three feeds a day. When day-old chicks are shipped in, they should be put in the brooder at once and as soon as they are thoroughly warm, they should be fed the same as for the second day for chicks hatched at home.

The first feeds of cracked grains are fed on a shallow litter or in pans. The amount of this feed as well as the depth of the litter increases as the chicks grow older. At the end of the first week the litter is two inches deep. A dish of bran or hopper of dry mash is
kept before the chicks. Bone, grit and charcoal is also kept before them at all times.

By the end of the second week the number of feeds of moist mash is reduced to two and the depth of the litter is increased to three or four inches. As the number of feeds of moist mash decrease the amount of the cracked grain fed is increased.

During the third week the mash mixture "D" is gradually substituted for the mash mixture "C" and is fed moist two times a day until the end of the fourth week. The litter is now five or six inches deep.

From the fifth to the eighth week only one feed of moist mash is given daily and the same mash except dry is before them in hoppers. If the cockerels are to be sold as brollers they may be continued on the above feed until they are about ten weeks old, then they may be crate fattened for two weeks longer before being marketed. If they are to be caponized they may be run with the pullets which may be fed only dry mash in hoppers and the grain mixture "B" in the litter once a day. If early maturity is desired one feed a day of moist mash would be continued.

SANITARY PRECAUTIONS.

Fig. 6 shows a good dry mash feeder for chicks. Note the one inch mesh netting which lays on the feed to prevent the chicks from scratching it from the trough.

Throughout the entire brooding period the feed and water dishes should be kept clean and scalded often to prevent disease. For this same reason the litter in the pens should never be allowed to become filthy, but should be removed often.

Many feeders use potassium permanganate in the drinking water to prevent the spread of disease through the water supply. A stock solution is made by placing a couple of inches of the permanganate in the bottom of a wide mouthed bottle and then filling it with water. Enough of this solution is added to the drinking water to give it a wine color. Potassium permanganate may be purchased at a drug store at about twenty-five cents a pound and a pound will last the average poultry keeper a long time.