BROODING
and
REARING
BABY CHICKS

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BROODING AND REARING BABY CHICKS

BY DANIEL W. TALMADGE, Extension Poultryman
University of Connecticut

RAISING BABY CHICKS for layers, broilers or roasters is a popular 4-H Club project. In this venture you can gain much satisfaction and valuable learning experience. Moreover, you can contribute to the health of your family by raising these very nutritious foods—eggs and poultry meat. You will be able to sell some and provide yourself with pocket money.

As with any 4-H activity, you will want to do the best job possible. Promise yourself at the start that you will give the birds regular care. Keep the feed and water before them at all times. And make sure that the chicks are comfortable. Once started, you will need to spend only a small amount of time each day to care for your flock.

In this bulletin you will find information on the care and development of baby chicks. Read this material carefully—it will help you increase your chances of success in this project. Remember to consult your club leader on problems that you can’t handle adequately.

WHAT WILL IT COST?

It will cost you from 0.52 to 0.60 cents for each pullet day-old chick. Other additional basic costs are $1.64 to $2.05 for 20.5 pounds of feed for each pullet chick up to 22 weeks and .13 to .15 cents for heat and litter. The total cost, therefore, ranges from $2.29 to $2.80 to raise a chick to ready-to-layout size (see Table 1).

Of course, if you lose birds along the way, the total cost to raise each bird will be more. All expenses considered, you may save money by

<table>
<thead>
<tr>
<th>Replacement Pullets (to 22 weeks of age)</th>
<th>Meat birds (Broilers 3½ lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per chick</td>
<td>$0.38 - $0.40</td>
</tr>
<tr>
<td>Cost of feed 20.5 lbs.</td>
<td>7.71 lbs.</td>
</tr>
<tr>
<td>Heat and litter</td>
<td>$0.13 - $0.15</td>
</tr>
<tr>
<td>$2.29 - $2.80</td>
<td>$1.28 - $1.40</td>
</tr>
</tbody>
</table>

This bulletin was originally written in cooperation with Richard Warren, Extension poultryman at the University of New Hampshire (since retired), and Thomas Higgins, retired Extension poultryman at the University of Rhode Island.
growing your own pullets, and you get the experience as well. Many poultrymen believe that home-grown pullets are healthier than purchased pullets.

BUYING YOUR CHICKS

When to Start

The exact time to start your chicks may depend on the type of housing you have and your brooding equipment. Winter-hatched birds start laying in the early summer, but may go into a neck molt and a "vacation" period the following winter. Pullets hatched in the late winter or early spring start to lay in the summer when egg prices are usually high. Those raised late in the spring will not start laying until late fall. At that time, egg size may be small and prices lower.

Probably the best time for 4-H members to buy their chicks is April and May. These chicks are much more satisfactory for those who do not have cold weather brooding facilities. Moreover, the pullets will start laying in early fall and continue laying for at least 12 months.

Breeds for Best Results

Production birds that lay brown eggs are the most popular with 4-H members in New England. This includes all of the sex-linked crosses; black and buff colored females, other production crosses popular in your area as well as purebreds such as Rhode Island Reds.

If you are planning to raise cockerels for meat, your best choice will be from among the white meat breeds, such as White Plymouth Rocks.

After deciding on what breed you want, be sure to buy healthy stock. Get chicks from flocks that are rated as U. S. Pullorum clean, (free from Pullorum disease) and have high production records.

Get the best chicks you can buy. Cheap chicks may cost you more in the end than those that cost more in the beginning. If possible, buy your chicks from hatcheries or breeders near your home or within the state. Consult your County Club Agent for more information on sources of good baby chicks.

WHAT SIZE FLOCK SHOULD YOU HAVE?

Before deciding on the size of your laying flock, consider first the time you have available and the space requirements.

Time for Care

A flock of 12 laying hens should keep a family of 6 adequately supplied with eggs. However, a flock of 25 hens doesn't take much more time and there will be eggs for sale.

Space Requirements

You need to provide a house or pen large enough to allow each layer 3 to 3 1/2 square feet of floor space. Example: a 10' x 10' pen will take care of 25 hens adequately.
ESSENTIALS FOR SUCCESSFUL BROODING

Housing Needs
Your brooding area should be draft and rain proof and protected against rats and mice. Baby chicks need about 1 square foot of floor space per chick for the first 8 weeks. The pen should have windows for ventilation and sunlight.

![Diagram of Infrared Bulb Brooding Unit](image)

*Figure 1 – A satisfactory infrared bulb brooding unit for up to 75 chicks.*

Types of Brooders
Infrared lamps are excellent for brooding small flocks of chicks (see Figure 1.). The equipment is inexpensive and the lamps are excellent for supplying heat to the chicks in the late spring, summer, or early fall months.

Many 4-H flocks are brooded with brooders heated by electric light bulbs. Contact your club agent for plans on electric light brooders.

Conventional brooders, usually oil, gas or electric, have a hover to keep the heat at the floor level. These brooders are excellent for flocks of 100 chicks or more. The initial cost is greater than the infrared brooder unit.

Brooder Guards and Litter
Brooder guards keep the chicks from wandering away from the heat and getting chilled. They are made from cardboard, tar paper, or wire. It should be about 1 foot high and long enough to go around the brooder. Allow about 3 feet between the brooder and the edge of the guard.

Cover the floor of your pen with litter. It should be dry, clean, and have good absorbing qualities. Recommended materials to use include dried sugar cane, wood shavings, and peanut shells. Chopped hay or straw and dry leaves have been used in an emergency. A thin layer of dry fine sand on the floor and about 1 or 2 inches of litter make a good floor for the chicks.

Types of feeders
for various age groups (see Table 2.).

Feeders
Feeders should be constructed so that the birds can get at the feed conveniently and still not waste any of it. At least two sizes of feed hoppers are needed with enough feeding space...
Table 2. – Recommended Feeder Space for Chicks

<table>
<thead>
<tr>
<th>Age of Chicks</th>
<th>Length</th>
<th>Depth of Feeders</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4 weeks</td>
<td>at least 1 inch per chick</td>
<td>2-3 inches</td>
</tr>
<tr>
<td>4-8 weeks</td>
<td>at least 2 inches per chick</td>
<td>4 inches</td>
</tr>
<tr>
<td>8 weeks on</td>
<td>at least 4 inches per chick</td>
<td>5-6 inches</td>
</tr>
</tbody>
</table>

Table 3. – Amount and Kind of Feed Required for 25 Pullet Chicks by Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Amount and Kind of Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 weeks</td>
<td>100 lbs. of Starter</td>
</tr>
<tr>
<td>7-10½ weeks</td>
<td>100 lbs. of Starter or Grower</td>
</tr>
<tr>
<td>10½-22 weeks</td>
<td>500 lbs. of Grower</td>
</tr>
<tr>
<td>22 weeks on</td>
<td>100 lbs. of Layer ration every 2 weeks</td>
</tr>
</tbody>
</table>

so that all the birds can eat at one time. It is easy to make wooden hoppers from spare pieces of lumber. Ask your club agent for plans.

Table 2 indicates the recommended feeder space per chick.

To figure feeding space, count the length of both sides of the feeder. A feeder 24 inches long has 48 lineal inches of feeding space and should feed 48, 3-week-old chicks. You also should have a clean place to store your feed where it will be protected. A metal barrel or a wooden box with a cover will serve the purpose.

Looking at Table 3 will tell you the amount of feed you will need to buy for your project.

Waterers

Water is the most important nutrition the chicks receive. About 65 per cent of the bird’s body is water. Therefore, you need to keep water before the birds at all times.

Types of waterers for various age groups (see Table 4.).

You can make your own water fountains, using 5-quart oil cans or fruit-juice tins and tin plates. Make 2 holes on opposite sides of the can about 3/4" from the lip. Fill with water, place the plate on top and flip over (see waterer at right in picture).

It also would be good to put a small wire platform underneath each fountain. It keeps the water cleaner and prevents damp litter.

Table 4 will help you figure the size and number of waterers.

PREPARING THE BROODER HOUSE

Cleaning and Checking
Start preparing for your chicks at least 3 weeks before the chicks arrive. Brush the cobwebs and dirt from the ceiling and walls. Clean, wash, and disinfect the floor. Use a good disinfectant for the floor area, such as coal-tar disinfectants like creosote or carbolineum. Be sure to air out the houses thoroughly before putting in chicks.

Patch up any leaks in the roof or cracks in the walls. Clean the water fountains and hoppers thoroughly and make any needed repairs.

Get rid of any rats or mice that might be in the brooder house. Put out poison baits; some
Table 4. - Size and Number of Waterers for 100 Chicks

<table>
<thead>
<tr>
<th>Age of Chicks</th>
<th>Number</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4 weeks</td>
<td>4</td>
<td>1 or 2 quarts</td>
</tr>
<tr>
<td>4-8 weeks</td>
<td>2</td>
<td>2 or 3 gallons</td>
</tr>
<tr>
<td>8-20 weeks</td>
<td>1</td>
<td>5 gallons</td>
</tr>
</tbody>
</table>

Never allow your chicks to be without water and feed.

form of anticoagulant should do the job. Block up any rat holes in the floor by nailing pieces of metal over them.

Next, set up your brooder and see that it is in good working order. For your electric brooders and your infrared heat lamps, be sure that the wiring is in good shape. Check for broken wires and replace them. If you use an infrared heat bulb, be sure that the chain, cord, and wire guard are fastened tightly. Never have the infrared lamp closer than 18" from the litter.

Hang the infrared lamp 18" from the litter.

Clean your brooder house thoroughly before the chicks arrive.

Patch up cracks in the walls to prevent drafts and mice from getting into the house.
If you use the conventional brooder heated by oil or gas, check your brooder and see that it is cleaned out thoroughly. Make sure that your storage tanks and the lines from the tank to the brooder do not have any leaks. It is always best to check the safety features with an adult.

**Be Safe, Not Sorry**

Always follow good safety practices in your brooder house. Every year, some poultrymen lose baby chicks through carelessness or because they didn’t take time to check their equipment.

Always start your chicks on fresh litter. If you should raise more than one brood of chicks during the year, it is best to clean all of the old litter out and put new litter for each brood of chicks.

*This brooder pen is ready for the chicks.*

Arrange the feeder and the fountains around the brooder. Some people put their feeders around the brooder evenly like the spokes coming out from the hub of a wheel. The fountains are set in between and near the edge of the hover.

Set up the chick guard around the hover at least 2 or 3 feet away. Block off the corners of the house to prevent the chicks from crowding in case they should become frightened after you take away the guard. Extra litter piled in the corners works very well.

If possible, leave the pilot light on in your brooder pen at night. This enables the chicks to find their way to the source of heat in case they should wander away. A thermometer is also useful for checking the temperature. If you watch your chicks closely, they can tell you better than anything else whether they are comfortable. If they are spread evenly around or under the brooder, they are comfortable. If they huddle up close, they are too cold. If they push up against the guard, they are probably too warm (see Figure 2).

**GIVE CHICKS A GOOD START**

The day before your chicks arrive, check all the equipment in your brooder house to make sure that it is in good working order. Start the brooder so it will be warm. Some junior poultrymen cover...
the litter around the brooder with papers for the first few days, but this is not necessary. It is good practice to put some mash on paper plates, cut-down chick box covers, or on new egg-case flats. Set these on the litter where the chicks can find the feed easily for their first feedings. Be sure to take these out after the third day because continual use can result in wasted feed. Also, fill the chick hoppers with mash.

What To Do After Chicks Arrive

1st to 3rd Day - As soon as you get your baby chicks, put them under the hover. Check them often to see if they are eating and drinking. Keep mash on the paper plates and the hoppers about two-thirds full. It is not necessary to give chicks scratch feed the first day. Clean the water fountains and refill every day.

The temperature for the first week should be about 95 degrees F. at the edge of the hover, 2 inches above the floor. Use a good thermometer. The infrared bulb should be 18 inches from the litter.

At the 4th Day - Enlarge your chick guard to make a comfortable working area around the hover. At the end of the 1st week, remove the guard except to round out pen corners to prevent crowding.

Watch how the chicks bed down at night. Chicks should bed down side by side, not pile up. At night, the chicks should be under or at the edge of gas and electric hovers; at the edge of coal and oil hovers; or fanned out if under infrared units (see Figure 2).

Each type of brooder will give a different room temperature. But watch small houses against overheating from the sun’s rays. If chicks crowd toward the corners or room temperature gets above 75 degrees F., open the windows.

Clean waterers each day inside and out. Don’t spill water on the litter. As the chicks grow, place the waterers further away from the brooder. Fill the feeders only two-thirds full from now on to stop the chicks from wasting feed. It’s

Figure 2 - Chick comfort.
a good idea to clean out the litter that has gotten into your feed — shake the feed to one end of the feeder before adding new mash.

Watch for toe and feather picking. Use a "stop pick" salve if this habit starts. Shade the windows if the sunlight is too bright on chicks.

At 2 Weeks — Continue to give your chicks all the feed they will eat, but fill the feeder only two-thirds full. As the chicks grow, add the intermediate-type feeder.

Replace water containers with 3-gallon size, 2 per hundred. Place the waterers on a wire platform to keep out the litter and help keep the floor dry.

Stir litter regularly to prevent caking and remove any caked or wet litter. Add fresh litter so that it is 3" to 4" deep on all parts of the floor. Help to prevent wet litter by opening windows for proper ventilation.

Lower the brooder temperature to 80 to 85 degrees F. and then reduce the temperature by 5 degrees F. each week thereafter. Raise the infrared bulbs 1" per week as birds grow.

3rd to 4th Week — It is time to add larger feed hoppers and water fountains. Your chicks should be about half feathered and should be making rapid gains in size. Be sure they are not crowded. Allow at least 1 square foot of floor space for each chick for the next 4 weeks.

Continue to feed the replacement chicks a high efficiency chick starter mash. Allow at least 2" of feeding space per chick. It is a good idea to leave the small hoppers in the pens for a few days until the chicks get used to new ones.

Stir the litter every few days to keep it loosened and dry.

If the weather is mild, your chicks can go without heat during the day. The temperature should be about 70 to 75 degrees F. under the hover at night. Raise the legs of the brooder until the edge of the hover is above the backs of the chicks. Continue to raise the infrared heat bulbs 1" to 2" per week.

Keep feed in front of the chicks at all times, filling the hopper only two-thirds full.

As the chicks get older, raise the brooder hover.
### Table 5. — How to Distinguish Males from Females at 4 to 8 Weeks of Age

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larger and heavier</td>
<td>Smaller</td>
</tr>
<tr>
<td>Greater comb and wattle development</td>
<td>Less growth on comb and wattles</td>
</tr>
<tr>
<td>Larger shanks and feet</td>
<td>Smaller shanks and feet</td>
</tr>
</tbody>
</table>

Check your chicks carefully. If you see any runts or sickly chicks, it is best to get rid of them now. ‘‘Cull’’ chicks usually do not grow up to be good birds.

**4th to 8th Week** — Your chicks should be almost fully feathered by now. Separate the cockerels from the pullets if you have extra room to house them. Both sexes will grow better if separated (Table 5).

Plan your feed purchases carefully. Change over to growing mash at 6 weeks for your pullets and to broiler finisher at 5 to 6 weeks for your broilers. Opening the windows on sunny days helps to control moisture. Stir the litter regularly to prevent caking. Make sure waterers are of the 2- or 3-gallon size. Set them on wire platforms to help keep the litter dry.

Check hopper space to see if there are 3, 6-foot feeders per 100 birds. Water fountains should hold a full day’s supply.

Remove and clean your brooder or infrared lamp and put them away in a safe place for use another year.

### MANAGEMENT DURING THE GROWING PERIOD

Some poultrymen put their birds on range during the growing period from about 8 weeks until a week or so before the birds start to lay. However, range rearing of 4-H flocks is very hazardous, since members are not at home all day to watch their flocks for damage by predatory animals. These include dogs, coons, foxes, owls and hawks.

**For Replacements**

If you use a range, be sure to shut the chicks in the house or shelter at night. However, most young birds are raised in confinement. If birds are confinement-reared, make sure that they have plenty of feed and water space. Also allow at least 2 square feet of floor area per bird.

If the pullets are ranged, the best practice is to have a range shelter, a clean grass range with a tight fence around it, and special feed hoppers. The latter will protect the feed from wind and rain.

Confinement rearing is recommended for the meat birds.

**For Meat Birds**

Meat birds should have been separated from the production pullets at about 6 weeks of age and fed a high efficiency broiler ration. Keep plenty of clean water and fresh feed before the birds at all times.

Some meat birds will weigh 4 lbs. or better at 8 weeks of age. These birds should be killed and dressed, and eaten as broilers. If you keep your meat birds longer than 8 or 9 weeks, they will develop into roasters. They also will cost more to raise per pound of gain than the broilers.
**KEEP YOUR FLOCK HEALTHY**

There are several troubles that might affect your chick flock. If you keep your litter dry, follow a good feeding program, and have fresh air in your brooder house, you will go a long way in keeping your flock healthy.

*Provide fresh air in your brooder house by regulating the windows.*

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**Diseases**

Some diseases your flock might have include coccidiosis, newcastle disease, and bronchitis. There are vaccines available for newcastle and bronchitis. Check with your club agent for vaccination recommendations.

**Parasites**

Sometimes young stock become infested with red mites or body lice. Doing a good cleaning job in your house before the birds arrive should help control these parasites. Nevertheless, it is a good plan to look over your pullets often for parasites.

**Poultry Lice** — Several kinds of lice may appear on various parts of a chicken. They feed on dry skin and feather parts, causing a constant irritation to the birds. Their eggs, laid at the base of the feathers, hatch in two or three days.

If left uncontrolled, lice will multiply on the birds. To get rid of them, use 4 per cent malathion dust in the litter at the rate of 1 lb. per 50 square feet of floor space.

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**Poultry Mites** — Two kinds of mites that affect poultry are red mites and northern fowl mites.

Red mites feed on the birds at night and hide during the daylight in the cracks and crevices of the poultry house. They are usually found near the bird’s tail or abdomen. To control them, use 4 per cent malathion dust in the litter, 1 pound per 50 square feet of floor area. Use a duster or shaker jar and apply to dry areas only. For complete control, make 2 treatments 7 to 10 days apart.

Northern fowl mites spend their entire life on the body of the chicken. You can find them near the tail, vent, or on the shanks. Note: the shanks appear to have had pepper shaken on them. In the laying house you often see the small mites crawling on the chicken eggs. Treat the same as for red mites; also apply some dust to the nesting material.

*Caution:* Malathion dust should be kept out of the feed and waterers. BE SURE TO READ THE LABEL ON THE PACKAGE AND USE ONLY AS RECOMMENDED.

**Bad Habits**

**Feather Picking** — If chicks are too crowded or too warm, they start feather picking. You can stop this trouble by darkening the room, or by putting anti-pick paste or pine-tar product on the tails of the affected birds. Debeaking birds is the best way to prevent feather picking. Some specialists recommend debeaking all replacement pullets between 12 and 16 weeks. This will prevent cannibalism, egg eating, and feather pulling in the laying house. Ask your club agent to assist you in borrowing an electric debeaker. This machine takes off the upper end of the beak and sears the cut to prevent bleeding.

For a small number of birds use a dog nail clipper to remove the point of the upper beak.

**Other troubles** — Keep a close watch on the behavior of your chicks. If at any time you think something is wrong, ask your club leader for
help. Don’t wait until you have lost several birds. Your State Land-Grant University provides a service in its Animal Diseases Department for detecting the different kinds of poultry diseases.

**KEEP GOOD RECORDS**

Records are an important part of every person’s activity. The older you get the more records you will be required to keep. Develop a good system of record keeping now and it will help you throughout your life.

Secure a chick record sheet from your club agent and follow the directions carefully. It will include spaces to record expenses for the birds, equipment, and feed. It also will include space for receipts. You should record the number of birds sold, price per pound, total received, and the number of birds that died or were culled. There will be an item for an exhibit record and also a summary of your total costs and total returns for your projects. This information will prove valuable if you decide to raise a flock of birds another year.

*Keep accurate records! They can help you do a better job of flock management.*

Records also help you to manage your birds better. If you are keeping careful track of the amount of feed that your chicks eat, you will be able to spot quite quickly any trouble that might occur. If you notice that your birds are eating less feed for a day or two, inspect the flock carefully to find out the reasons. A sudden drop in feed and water consumption means the birds may be sick.

*Hang your feed bags on a rack to keep them in good condition.*

**SAVE FEED AND FEED BAGS**

Poultry feed is the largest single cost in raising chickens. Prevent wastage of feed by following the suggestions listed below:

1. Keep rats and mice out of your pens.
2. Don’t let the birds get in the feed hoppers.
3. Make sure your feed hoppers have a good lip on the edge to prevent the birds from billing-out the feed.
4. Do not fill your hoppers more than two-thirds full.
5. If you allow your birds to range, make sure you use a range-type hopper.
6. Take careful care of your empty feed bags. They are worth money if you keep them in good condition. Make a rack to hang them on.
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