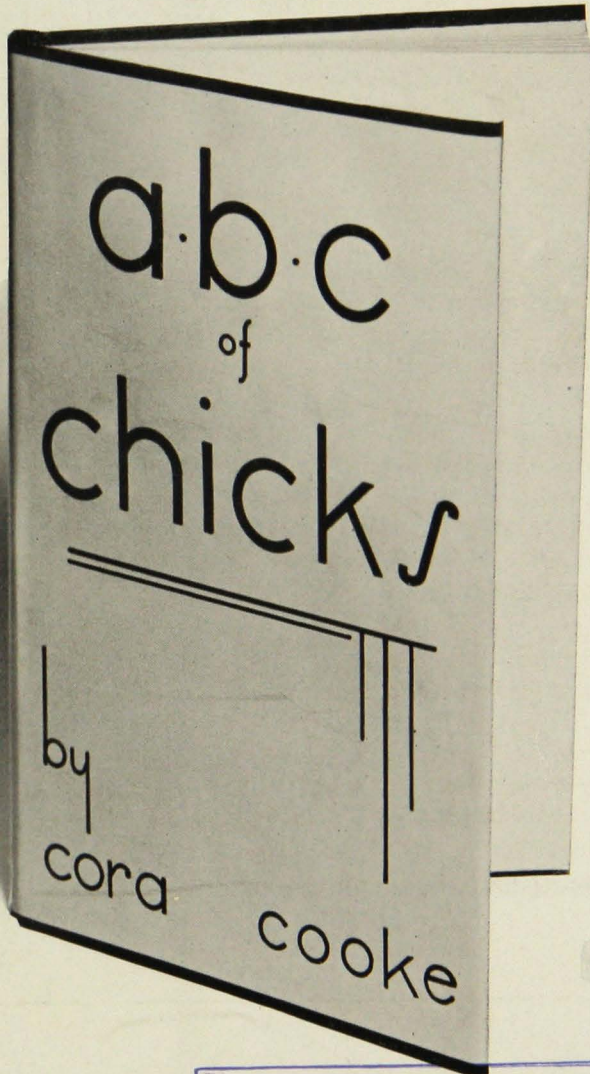


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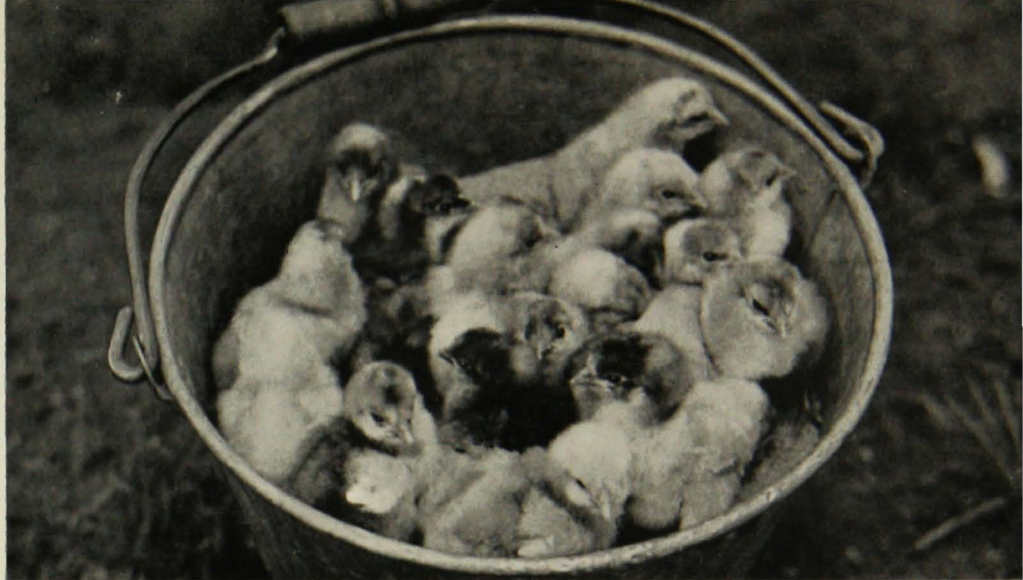
AGRICULTURAL EXTENSION DIVISION

THE A B C OF CHICKS

"Let the reader deal fairly by his poultry.
So will the latter deal fairly by him."

—From *The Practical Poultry Keeper*
Published in England in 1861.

1. Healthy Chicks
From high-laying flocks, pullorum tested.
2. Early Hatching
It takes six months to grow a good pullet.
Light breeds by April 15.
Heavy breeds by March 15.
3. Clean Ground
Away from last year's range and separate from the old flock.
4. A Complete Ration
Plenty of feeders—always kept filled.
5. Clean Feed
Non-waste feeders on stands.
6. Sexes Separated
As early as sex can be observed.
7. Early Housing
Whenever pullets begin to lay—or October 1 at the latest.



ONLY GOOD CHICKS MAKE PROFITABLE LAYERS

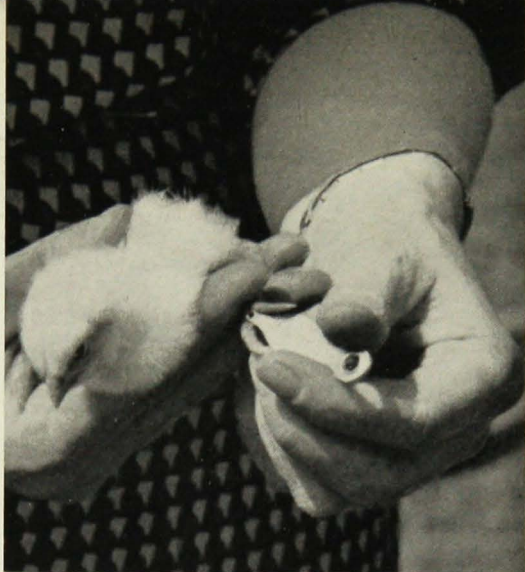
On most farms chicks are raised each year for the sole purpose of replacing part or all of the old flock. Good production of large eggs at a profit is the usual object of flock owners. To accomplish this, two things are essential in the chicks raised:

1. Health and vigor to live and grow.
2. Reasonably good laying ability.

Neither of these can be left to chance. It takes breeders high in vitality to produce healthy vigorous chicks. The only way to avoid excessive losses from pullorum disease (white diarrhea) is to get chicks from flocks tested for this disease—flocks from which all reactors have been removed.

So it is with laying ability. In order to maintain or increase flock production from year to year, it is imperative that breeding hens be selected for their ability to lay good-sized eggs and many of them. This does not mean that the only profitable chicks to raise are those from trapnested, high-production pens. Such chicks may be too high-priced to be economical for the owner of a side-line farm flock. However, many flock owners and hatchery operators are improving their chicks with the use of pedigreed breeding males from such trapnested flocks and are able to supply eggs or chicks at prices little above those charged for the common run of chicks. Such chicks are a good buy.

Early hatched chicks make the best returns. They are less subject to soil-borne diseases, and they have time to mature and lay full-sized eggs in the fall when prices are best. Heavy chicks are best hatched by March 15. Leghorns may be hatched a month later.



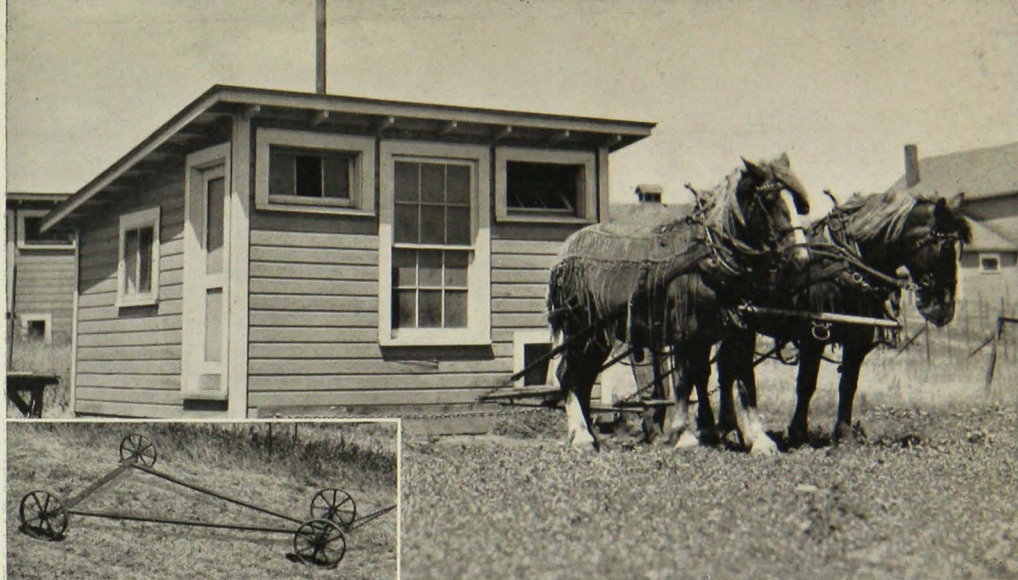
MARKING CHICKS BEATS GUESSING

Each lot of chicks requires sorting to remove unthrifty ones. Professor Halpin of Wisconsin sets a good standard for selection at this age when he says, "A good chick has eyes like shoe buttons." If his advice is followed, all others will be weeded out when they are ready for the brooder house. Those kept need some kind of permanent mark so that those of different lots or from different sources will not lose their identity as they are growing. Pedigreed chicks will bear a numbered wing- or legband. Other chicks may be marked with a toe punch, using different combinations of the four webs in the feet to distinguish the different lots of chicks.

As the pullets develop, use colored legbands to mark those having outstanding characteristics such as early feathering or rapid growth. Early laying is a trait that should not be lost sight of. Pullets that begin to lay early usually continue to lay late in the following season.

Besides providing a record of quality in the individual birds marked, this method also provides a means of knowing beyond doubt the age of the birds remaining in the flock. Such information will eliminate the danger of keeping birds beyond a productive laying age, since laying ability is steadily reduced after the pullet year.

Banding may continue to be a simple means of keeping records after the pullets are mature. Broodiness may be virtually eliminated from a breeding flock by consistently marking with a colored legband any hen that goes broody, and adding a new band each time this condition is found. By weeding out the worst offenders broodiness may be reduced to a minimum.



CLEAN GROUND IS CHEAP INSURANCE

The chief diseases of chicks (coccidiosis, worms, and probably others) are spread by means of the droppings, the accumulations of one year being a serious source of disease for the next year's chicks. Old hens may act as carriers of certain diseases and pests, and contaminate the growing chicks, if allowed to run with them. This makes it very necessary to raise each year's crop of chicks entirely separate from the old flock and old yards, and to provide a range not used by poultry for at least a year previous. Heavily shaded yards must be left free of chicks for even longer periods in order to be safe, since they are less exposed to the germ-killing action of the sun. Movable shade shelters furnish the necessary shade for feeders and fountains, thus insuring that chicks will eat all they need for steady growth regardless of weather conditions.

Portable brooder houses are popular because they simplify the moving of chicks to clean range. However, if a stationary house is used, it is still possible to keep chicks from contact with contaminated ground by providing a wire screen sunporch on the front of the house for the first 6 or 8 weeks. Chicks can thus have the necessary outdoor activity as long as they require the heat of the brooder, and yet they run no risk of contact with coccidia, worm eggs, or other infection that may remain in the soil from the previous year. When the pullets can be moved to the field, wire range shelters will provide roosting quarters and all the protection necessary. These can be built and moved more easily and cheaply than can a satisfactory brooder house. Sunporches, range shelters, and shade shelters are illustrated in Minnesota Special Bulletin 163.



Courtesy of Webb Publishing Co.

GIVE CHICKS ROOM TO GROW

Probably no single mistake is more common than the tendency to put too many chicks in the brooder house. The excessive losses, uneven growth, and cannibalism that result are often laid to other causes, yet they must be expected if the house contains too many chicks for its size.

The brooder house must not only provide ample room, but should offer a wide range of temperature to suit the varying needs of the chicks. Recent experiments show that chicks thrive in temperatures almost as low as freezing if they have a heated hover to which to run. A 12' x 14' brooder house will take care of 400 chicks. A house much smaller than that provides no cool places where chicks can escape from the heat.

Cannibalism.—Chicks very readily develop the habit of “picking,” especially in a period of confinement during bad weather. Once started, it may continue even after the pullets are in the laying house. Crowding is an almost sure cause of this trouble. An unbreakable rule not to overcrowd chicks is good insurance against such a habit. Other causes are overheating and too dry air, insufficient feeder space or waterers, damp, soggy litter, or any other condition which limits activity. Hang a pail of water over the brooder stove to keep the air from becoming too dry. Provide a small protected yard or sunporch where chicks may get outside in chilly weather. If trouble starts, remove the picked chicks and supply such green foods as cabbage leaves, onions, or sods.

Good farm litters include chopped straw, clean chaff, and ground corncobs, if free from mold. A litter generally much liked consists of two or three inches of dry shavings, topped with chopped straw. It is light and dry and the droppings fall through to the floor where chicks are less likely to pick them up. Whatever litter is used, it should be replaced often enough to keep it dry and clean.



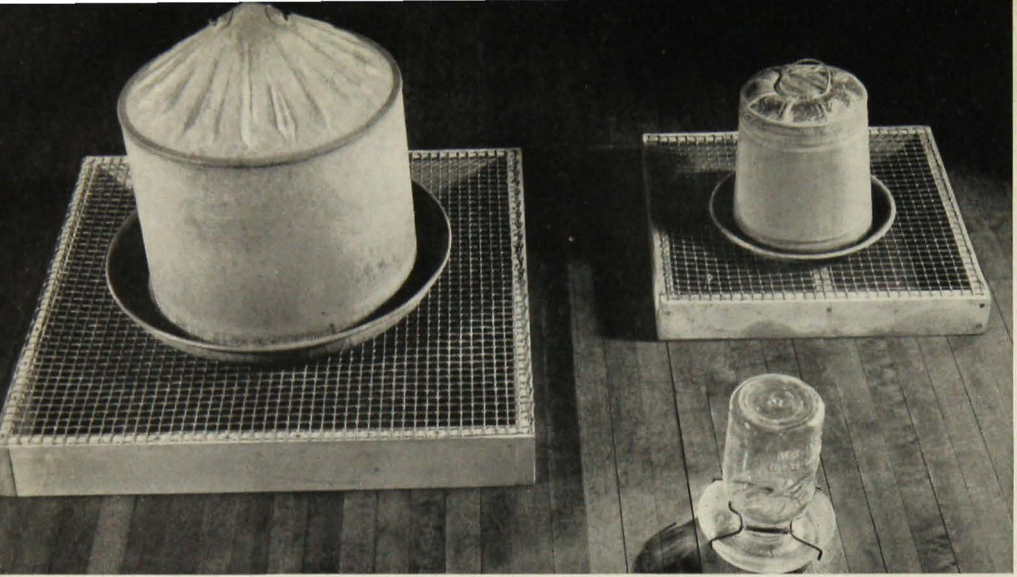
BROODER AND MANAGEMENT IMPORTANT

There are on the market a large number of good brooder stoves of both coal and oil-burning types. Electric hovers are sometimes satisfactory, but unless the building is thoroly insulated they are not likely to provide sufficient heat in a cold spell. Whatever the type of brooder, it must be the right size for the flock and for the house. The standard size hover for 400 to 500 chicks has a diameter of 52 inches for use in a 12' x 14' house. A smaller one, 42 inches in diameter, will care for 250 to 300 chicks. A larger one, 60 inches in diameter, will brood 600 or 700 chicks. Best results are obtained where the brood does not exceed 400 chicks.

The brooder stove should always be set up and operated several days before the chicks arrive. This practice will avoid much grief due to difficulty in getting the stove regulated after the chicks arrive.

Before chicks can be safely left to look after themselves, they must learn the purpose of the hover and how to use it. To guard against their wandering too far away from the heat, set up a circle of fine chicken netting around the hover for the first few days. If placed where the temperature is about 75° Fahrenheit when the temperature under the edge of the hover is 90° Fahrenheit, the chicks will run no risk of being chilled. At the same time, they will have sufficient choice of temperature for comfort.

Reduce the temperature under the hover a few degrees each week, until heat can be discontinued at about six weeks. After the first few days the chicks will show by their actions whether or not they are warm enough. Better growth and feathering will result if the room is kept quite cool except for the area under the hover.



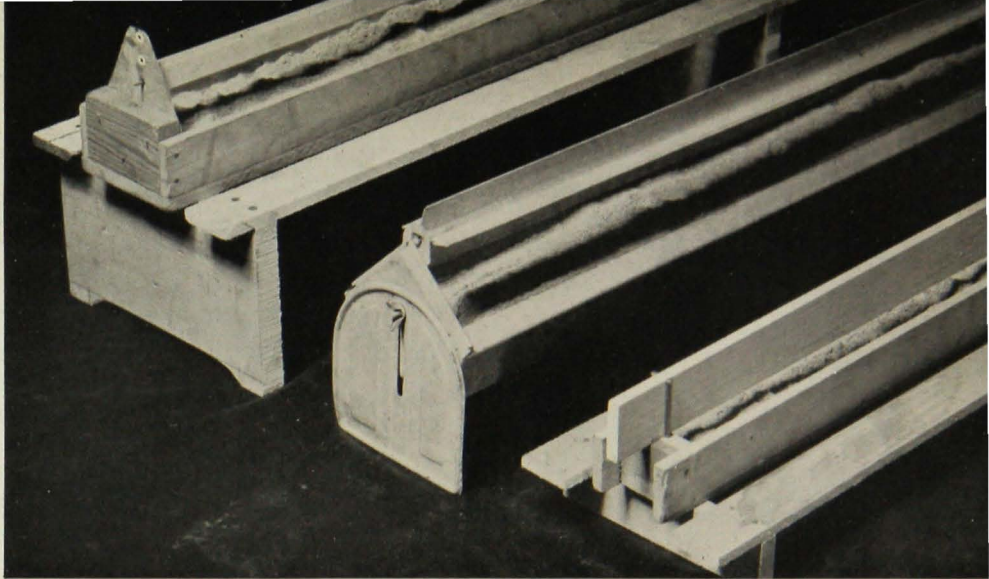
LOW-COST EQUIPMENT SATISFACTORY

Feeders and fountains should be non-wasting and built so that feed and water can not be fouled with litter and droppings. Such equipment should be inexpensive so plenty of it can be provided at all times, insuring that chicks can eat and drink at will. Such provision will promote rapid, even growth and, at the same time, help to prevent cannibalism.

Troughs, feeding from both sides, are economical and easy to care for. They may be used even for water and milk after the first few weeks to reduce labor. Suitable galvanized troughs are on the market. Cheaper ones can be made at home. A starting feeder, shown above, made of three laths with a fourth one extending lengthwise on top of the trough, will serve during the first two weeks. The next six weeks use a trough with a 1" x 4" bottom, lath sides, and an adjustable 1" x 1" reel suspended in galvanized end pieces. Wasting of feed can be prevented if the reel is always set so that chicks must reach down into the feeder instead of being able to reach across under the reel. Place feeders on stands from the beginning to keep feed clean and to save floor space. Move feeders and fountains daily.

Place all fountains on wire platforms so that chicks can not reach damp spots that are sure to surround the fountains. Such spots are ideal breeding places for disease. As soon as the chicks are on range, large waterers that need be filled but once daily will prove effective labor-savers. They can be hauled to and from the range on skids or wheels.

Feeders for different ages: first two weeks, at least one 4-foot feed trough for each 100 chicks; two to eight weeks, two 4-foot feeders for each 100 chicks; eight weeks to maturity, two 5-foot feeders for each 100 birds.



CHICKS NEED TRAINING

Chicks seem to have but two instincts—to wander about investigating their surroundings and to peep when they get into trouble. Everything else has to be learned, and meanwhile the wise poultryman tries to protect them from harm. Feed is put into feeders, but it is also scattered on boards where they are sure to find it. The wire fence around the hover serves only to keep them from being chilled while they learn the “ins” and “outs” of the hover. As soon as they move in and out freely the wire can be removed.

For no apparent cause, chicks have a tendency to huddle together, especially at night. For safety, make them form a ring around the outside of the hover, with no piling up at any point. Some poultrymen reduce such crowding by darkening the windows and pushing the chicks around in a circle. Others burn a dim light hung at the center of the room all night. Not only does this reduce crowding, but it permits chicks to get feed and water whenever they wish. If they persist in piling up, look for and correct any cause, such as drafts.

Crowding in the corners of the brooder house is a frequent source of loss. To avoid this, round off the corners with triangular pieces of wire netting, so arranged that chicks can not fly over them.

At six weeks of age, chicks should be going on the roosts at night. Many serious cases of roup have been traced to overheating, due to crowding in the corners at night in warm weather. Chicks of a heavy breed often have to be placed on the roosts each night until they form the habit of going up by themselves. A sloping platform with wire netting beneath the roosts helps greatly in teaching chicks to use the roosts. When chicks use the top roosts regularly, raise the platform to a level position.



ANIMAL FOOD MUST BE PROVIDED

To be economical, feeds and feeding methods should be such that chicks grow rapidly and evenly from hatching to maturity.

The table on page 12 shows that chicks increase in weight very rapidly in six months' time. Even Leghorns, at three pounds, are about 25 times as heavy as when they were hatched, while heavy breeds multiply their original weight about 35 times in that period. Such gains can not be expected without a steady supply of a well-balanced ration. If the feed supply is short, or if certain necessary elements are omitted, even for part of the season, the chicks will require more time and more feed to reach maturity. Pullets that lack a complete ration through any part of the growing season will delay laying, frequently until the period of high fall egg prices is past. There is no time when chicks can pick up enough feed on range to promote good growth.

Chicks do not require a large variety of feeds, but certain elements are absolutely necessary. The grain mixture, both cracked and ground, may be quite simple, consisting usually of corn, wheat, and oats. During the first eight weeks the oats should be without hulls. If it is not possible to have oats hulled, they may be bought in the form of oat groats or feeding oatmeal. Yellow corn is essential for chicks that do not have a green range, because of the growth-promoting vitamin that it contains. If yellow corn is omitted and barley is used in its place, the chicks must have 8 to 10 per cent alfalfa leaf meal in their mash or be provided with green alfalfa. To the grains must be added some form of animal food, such as meat scrap or milk. A combination of these two makes for best results. When dried milk is too high in price, surplus liquid milk makes an economical source of protein and can be used to reduce the amount of meat scrap required.



COMPLETE RATION NEEDED FOR GROWTH

As early as 1923 the Minnesota Agricultural Experiment Station, in a series of experiments, showed that chicks will not live more than a few weeks without some animal food. Different lots of chicks were fed mixtures of grains plus varying amounts of meat scrap. Two check lots received no meat scrap or other animal food. Throughout the experiment there was a marked difference in both rate of growth and death rate.

In the pens with no meat scrap, practically all the chicks died, only one remaining at eight weeks, out of two pens of 26 chicks each. Best results were obtained when about 15 per cent of the total ration consisted of meat scrap, the death loss amounting to only 12 per cent. Moreover, the chicks receiving this amount of meat scrap gained in weight about eight times as much as did those having no meat scrap.

Cod liver oil has come to stay in the ration of chicks that must be confined to the house the first few weeks. Experiments have shown that chicks confined to their houses for three or four weeks without access to direct sunshine develop marked cases of rickets, with a heavy death loss, unless fed cod liver oil or some other carrier of Vitamin D. Experiences of farmers have borne out these experiments. Once the chicks are out-of-doors regularly, it is unnecessary to continue the cod liver oil. It is, however, a wise precaution to supply it at the rate of one pint in each 100 pounds of mash for the first two or three weeks, even to late chicks that might be expected to run on range from the beginning. Chicks that have enough meat scrap and oyster shell in addition to the grains will not need complex mineral mixtures, provided that cod liver oil is used as recommended.



HOME-MIXED RATIONS MEET ALL REQUIREMENTS

The simplest method of supplying these mixtures is to keep before the chicks, from the beginning, a mash mixture containing the ground grains and meat scrap. Scratch feeding in small amounts is begun within the first two weeks and increased as the chicks develop.

There are many good feed formulas. A simple, home-mixed ration can be used with good results beginning with the first feed.

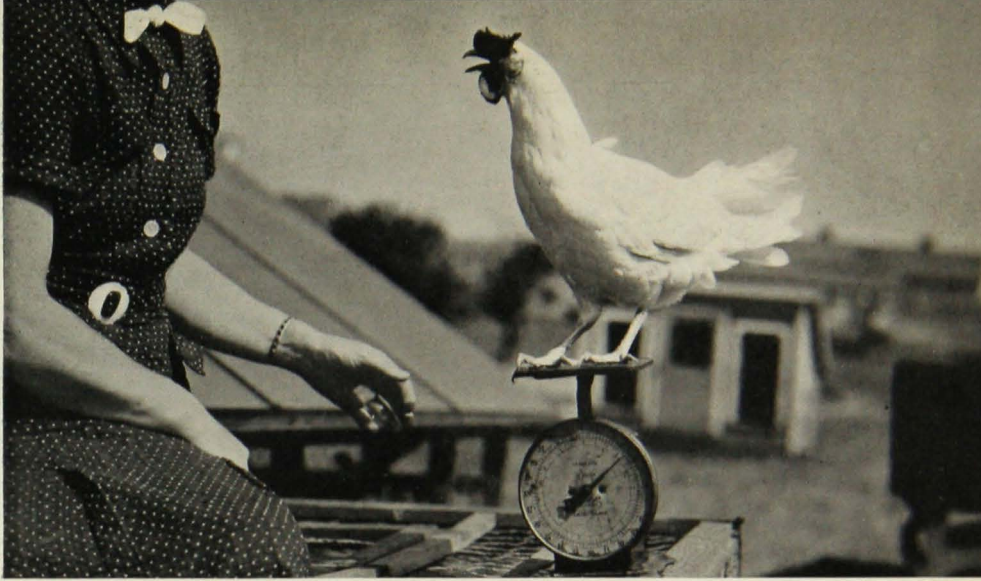
STANDARD RATION

Scratch	Mash
200 pounds fine cracked yellow corn	100 pounds ground yellow corn
100 pounds cracked wheat	100 pounds bran
100 pounds steel cut oats	100 pounds standard middlings
	100 pounds ground oats (hulled first eight weeks)
	100 pounds meat scrap
	3 pounds salt
	2½ quarts cod liver oil

If milk is kept constantly before the chicks, the meat scrap may be reduced one-half.

Have feeders of dry mash in place, ready for the chicks as soon as they are dried off and hungry. Small amounts of mash may be fed on papers or boards so that all chicks start eating early. The cup flats commonly used in egg cases make excellent starting feeders. Water or milk must be available at all times if chicks are to eat as much dry feed as they need. Keep clean sand spread under the hover from the start, thus providing the necessary grit.

The first few feedings of scratch feed are best scattered on top of the mash in feeders. Later it may be fed in special feeders or scattered on clean ground.



RATE OF GROWTH WILL VARY

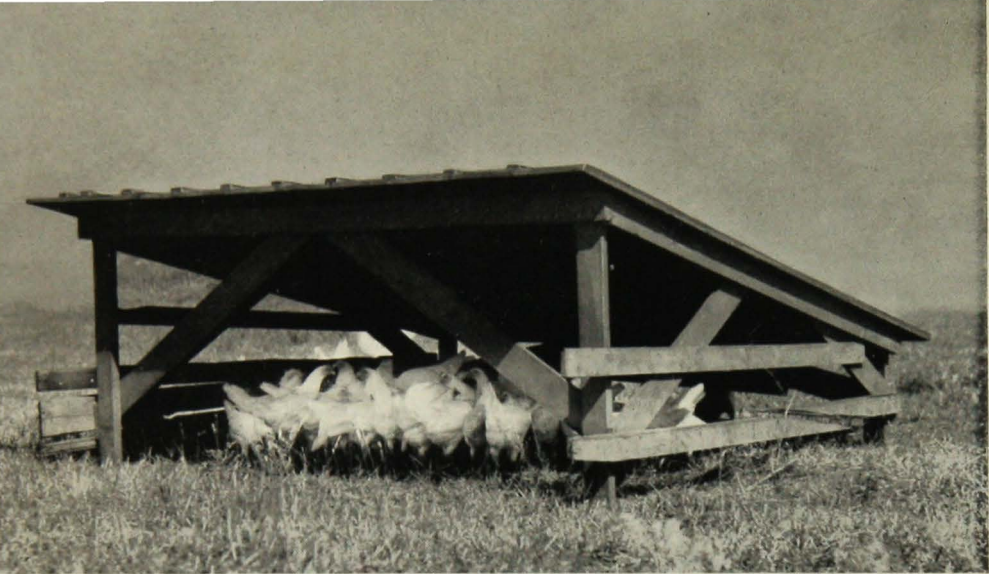
Different flocks and different breeds vary in their rate of growth. According to repeated tests at the Connecticut Agricultural College, the average rate of growth in White Leghorns and Rhode Island Reds may be expected to be about as follows:

WEIGHT OF CHICKS AT FOUR-WEEK INTERVALS

Age Weeks	Leghorns Pounds	Rhode Island Reds Pounds
4	0.4	0.8
8	1.1	1.2
12	1.8	2.3
16	2.4	2.9
20	2.9	3.7
24	3.3	4.3

Feed requirements are about the same for both breeds for the first eight weeks, amounting to a little less than $3\frac{1}{2}$ pounds per chick. However, the Leghorns use about 22 pounds per chick in 24 weeks, while the Reds require nearly 26 pounds per chick in the same period.

This represents only average weight and feed consumption for cockerels and pullets. Better gains than this are frequently made when good feeding and management are practiced. Cockerels, as a rule, gain faster than pullets so that they should reach broiler weight in a shorter time than the figures above indicate. The earlier the sexes are separated, the faster both groups will grow. It is not at all uncommon to have broilers weighing $1\frac{3}{4}$ pounds ready for market in 9 weeks.



PULLETS DEMAND SPECIAL FEEDING

During the first few weeks the chicks need large amounts of protein. For this reason the dry mash makes up the principal part of the ration at that time. As the chicks grow older, feed a larger proportion of scratch feed, increasing it gradually so that at 10 weeks chicks are eating as much scratch as mash. At 5 months the scratch consumption should be about 15 pounds per 100 pullets. This allows the pullets to attain their full body weight, complete their adult coat of feathers and develop a deep yellow in beak and shanks—conditions indicating good preparation for a winter of heavy laying. Pullets are less likely to have a winter molt if this rule is followed. Furthermore, they are likely to lay full-sized eggs in a shorter time than if allowed to lay before their bodies are full grown.

Separate the sexes.—As a general rule it is more profitable to dispose of all cockerels as broilers at $1\frac{1}{2}$ to 2 pounds. The feed requirement increases rapidly after this time and the price falls, owing to the usual seasonal drop in poultry prices and the fact that heavier birds will not bring broiler price. In certain seasons when poultry prices are high and feed prices low, it may prove profitable to hold heavy breed cockerels until they reach roaster weight, or four pounds. However, if this involves keeping the cockerels with the pullets for a longer time, it will be unwise even tho the price received might seem sufficient. The laying pullets represent the chief source of annual income and anything that retards their development will prove expensive. When selling cockerels as broilers, include any pullets that fail to keep up with their sisters in growth.



SORTING AND EARLY HOUSING PAY

A flock of pullets that reach their full adult weight before starting to lay may be expected to pay best as hens. Such developments will usually require from five to six months, even with the light breeds.

At this time pullets should be as big as hens, uniform in size, fully feathered and showing good body weight. If a yellow-skinned breed, they should have deep yellow coloring in beak and shanks.

Before housing, they will need a careful culling. In every flock will be found some pullets that are not worth keeping and that should be sent to market. Such pullets are those that have failed to reach the full size and development so necessary for good results or that lack a certain "motherly look in the eye" which Professor Rice of Cornell gives as the mark of a good layer. Those to be kept may well be moved to the laying quarters as they mature, leaving some of the slower-maturing ones to enjoy the free use of the range a little longer. Under no condition should pullets be penned with old hens. Neither hens nor pullets will lay as well as those penned and fed separately according to their needs. While the same ration is used for both, the pullets require more scratch feed than the hens can use to advantage. The extra cost of a partition to separate the pullets from the old flock will soon be paid in extra eggs.

Regardless of the age of the birds, when they start laying they should be put into their winter quarters without delay. To leave them on range after an appreciable number have started to lay, is to invite losses later on from a winter molt or from a production drop at the time of housing.

CONTENTED PULLETS LAY MORE EGGS

Pullets should be housed for the winter by October 1 at the latest, even tho they have not begun to lay. In northern Minnesota or in a rainy, cold season they will do better if housed earlier than this. This means that poultry houses must be ready for use on short notice. Houses that are permanently insulated and that have the necessary equipment always kept in good condition can be made ready for the pullets quickly with the least possible labor. Too often pullets are delayed for weeks in laying profitable fall eggs because the pressure of fall work prevents getting their house ready.

When pullets are placed in the laying house they need time and favorable conditions to settle down for their job of winter laying. They will get at this job in earnest in a shorter time if undisturbed. Letting them out on nice days only delays egg production. Delays will be caused if carpenter work and other "fixing" have to be done after they are housed. Keep the windows open as much as possible during the first few weeks so that the change from range conditions is not too sudden.

The same amount of feeder space is required as on range—one 5-foot feeder feeding from both sides for each 50 pullets. Keep feeders filled and water always available. Grain twice a day and one feeding of some green feed will keep the birds busy and contented. About 15 pounds of scratch feed daily per 100 pullets are needed at this time.

Pullets will usually use the roosts in the laying house if they have been in the habit of roosting while in their range houses. However, take no chances. Put them on the roosts at night if they fail to go by themselves.

A moist mash once daily provides a splendid means of keeping the pullets eating. If lights are to be used, begin as soon as the pullets are housed.

All these practices, if followed carefully, are effective in preventing fall colds which are often sources of heavy loss when pullets are first placed in winter quarters.

This bulletin has been prepared to cover the main principles of caring for chicks to maturity. Further information on special problems can be secured from the following bulletins:

- Folder 21, Healthy Chicks Make Hearty Hens
- Special Bulletin 105, Colony Brooder Houses
- Special Bulletin 163, Chick Equipment
- Special Bulletin 154, Timely Truths About Poultry Troubles