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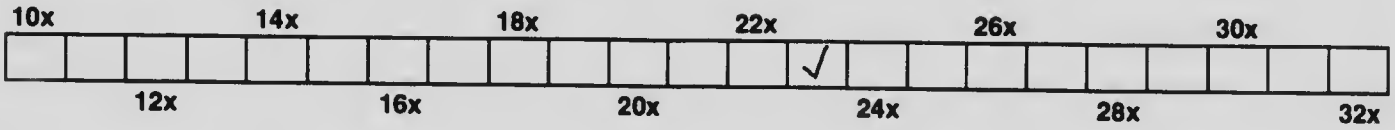

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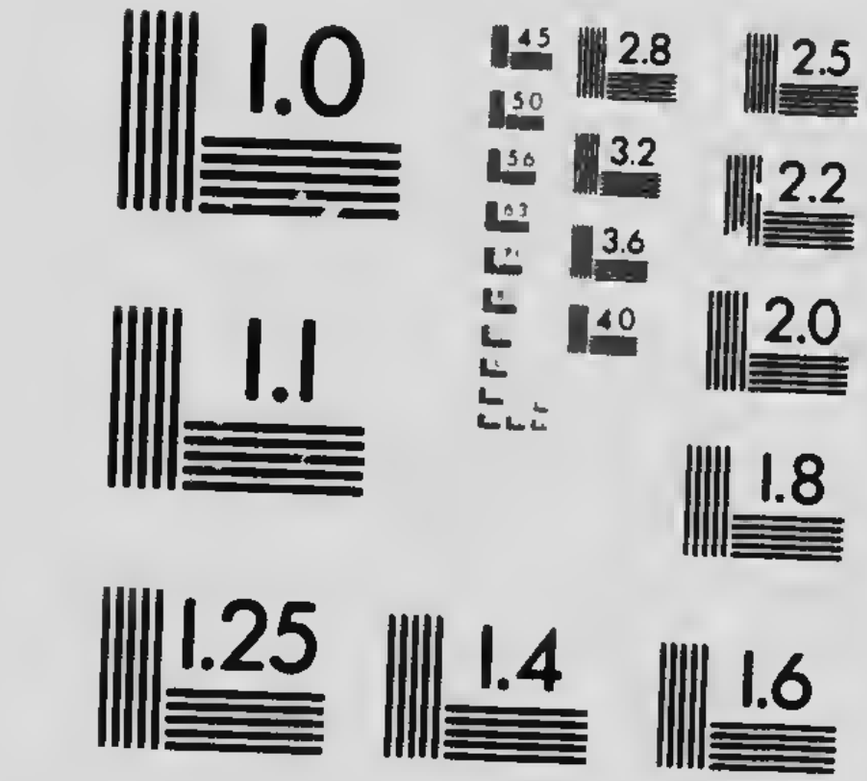

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Canadian Farm Poultry

M. A. JULL

Macdonald College
(McGill University)

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CANADIAN

FARM POULTRY

By

M. A. JULL, M.Sc.

Manager and Lecturer, Poultry Department

"All cookery rests on an egg. The egg is the Atlas that supports the world of gastronomy, the chef is the slave of the egg. What is the masterpiece of French cookery, the dish that outlives all other dishes, the thing that is found on His Majesty's table no less than upon the table of the bourgeoisie—the thing that is as French as a Frenchman and which expresses the spirit of our people as no other food could express it?—the omelette. Could you make an omelette without breaking eggs? Then cast your mind's eye over this extraordinary Monsieur Egg and all his antics and evolutions. Now he permits himself to be boiled plain, and even like that without frills, naked and in a state of nature, he is excellent. Now he consents to appear in all ways from poached to **perdu**, now he is the soul of a **vol-au-vent**, now of a sauce; not a piecrust fit to eat but stands by virtue of my lord the egg, and should all the hens in the world commit suicide, to-morrow every chef in France worthy of the name would fall on his spit, for fish is but a course in a dinner, whereas the egg is the cement that holds all the castle of cookery together."—**Stacpoole.**

MACDONALD COLLEGE
(McGill University)
1920

CONTENTS

Fig. 1.—A brooder field, where different types of houses and various makes of brooders are used.

Fig. 2.—A rearing field, where alfalfa, apples and chickens are grown annually.

FARM POULTRY

By M. A. JULL

INTRODUCTION

THE poultry industry is now recognized as a national asset, inasmuch as eggs constitute a national necessity for which there is no suitable substitute. A good farm flock is not only an important factor in the production of a staple food, but it is also an important factor in increasing the revenue from the farm. Most farmers now appreciate the fact that a well-kept farm flock pays as well, relatively, as most other branches of farming. As a result, there is more widespread interest in poultry raising than ever, and farmers in particular are anxious to learn of the better methods that are now yielding more satisfactory results.

The amount of revenue to be obtained from the farm flock depends upon a number of factors, comprising breeding, feeding and management. A right combination of these factors makes for efficiency, and efficiency makes for success. The factor of breeding might be considered as the basis for success, for no amount of good feeding and proper management will make poorly-bred hens lay many eggs. Given a well-bred flock, however, good feeding is of great importance, for it is only through good feeding that an animal can respond efficiently. Lastly, proper management, which includes incubating, rearing, housing and sanitation, is of service in obtaining maximum results from a well-bred and well-fed flock.

With bred-to-lay stock under efficient management it requires about four and one-half pounds of feed to produce one pound of eggs, or about seven pounds of feed to produce one dozen eggs. Under ordinary conditions, a laying hen consumes annually about ninety pounds of grain, ten pounds of green feed, two pounds of oyster shells, one pound of grit and one-tenth pound of charcoal. On the average farm, however, much of the feed is secured from the fields, and thus the cost of production is reduced considerably. If the average hen produced an average of twelve eggs each month of the year, she would be an efficient hen and would make a fair profit over present cost of feed. The basis of comparison in egg production, however, should be not only on the total number of eggs produced, but also on the time of production. Ten eggs laid in December or January are worth about twenty laid in April or May. The average farm hen lays about sixty eggs per year, principally from March to June, the season of low profits, whereas on feed cost alone

sixty eggs laid from November to March would pay for a hen's keep for one year, leaving the balance of the eggs laid during the year to pay other expenses and for profit-making. The number of eggs laid above that required to pay for a hen's keep for a year is of greater value now than ever, so that the heavy-laying hen is relatively more profitable than ever, in spite of increased feed prices. Conversely, the poor laying hen was never such an expensive boarder.

It follows, therefore, that in the production of a staple article of the diet of the nation, and in order to secure the most satisfactory results from his farm flock, the farmer must combine the most efficient systems of breeding, feeding and general management to secure maximum winter egg production.

BREEDS OF POULTRY

It would be useless to attempt to describe all of the breeds of fowl in a booklet, and, furthermore, there are a number of breeds which are of little economic importance. There is no best breed, but there are a number of breeds which should be given preference over others in matters of egg and meat production.

BRAHMA.—The Brahma, originating in Asia, is a large bird with heavy plumage and feathered legs, and for this reason is not kept extensively in Canada. It lays large, brown eggs, but it seems better adapted for meat production, since the Brahma makes an excellent roaster, although it is slow to mature. The skin is yellow. It is a good sitter. It has a pea comb and red ear-lobes. There are two varieties, the Light and the Dark, the former being the more popular.

The standard weights for the Light Brahma are: cock, 12 lbs.; cockerel, 10 lbs.; hen, 9½ lbs.; pullet, 8 lbs.

CORNISH.—The Cornish, originating in England, is a bird of good size and with a very compact body. It is noted more for its fleshing qualities than for egg production. The eggs are brown, and the skin and shanks are yellow. It has a pea comb and red ear-lobes. It is a hardy breed. There are three varieties: the Dark, White and White-laced Red, the last variety being smaller than the other two.

The standard weights for the Dark and White varieties are: cock, 10 lbs.; cockerel, 8 lbs.; hen, 7½lbs.; pullet, 6 lbs.

LEGHORN.—The Leghorn, originating in Italy, is a bird of small size, very active and attractive. It is essentially an egg producer, and as such is one of the most popular breeds in Canada, although it is more susceptible to changes in temperature than other breeds. The eggs are white and usually are of good size. It is a non-sitter. On account of its size, the Leghorn does not make a good table bird, except for the production of broilers. The skin and shanks are yellow. It has white ear-lobes. There are nine varieties of the Leghorn, including: Single-comb Black, Brown, Buff, and White, Rose-comb Brown, Buff, and White, Silver and Red Pyle. Of all these varieties the Single-comb White is the most popular and is kept in greater numbers than all others combined.

The standard weights of the Leghorns are: cock, 5½ lbs.; cockerel, 4½ lbs.; hen, 4 lbs.; pullet, 3½ lbs.

ORPINGTON.—The Orpington, originating in England, is a comparatively large bird. It is a good general purpose bird, being well fleshed and a fair egg producer. The body is broad and deep and the skin is white. The eggs are brown and of good size. It is a good sitter. It has a single comb and red ear-lobes. The four varieties include the Single-

Fig. 3.—Barred Plymouth Rock cockerel.

Fig. 4.—Single-comb Rhode Island Red cockerel.

Fig. 5.—White Wyandotte cockerel.

Fig. 6.—Black Orpington cockerel.

comb Black, Blue, Buff and White; the last two are the most popular for commercial purposes. In the Black variety the shanks are black, in the Blue the shanks are leaden-blue, and in the Buff and White varieties the shanks are white or pinkish-white.

The standard weights are: cock, 10 lbs.; cockerel, 8½ lbs.; hen, 8 lbs.; pullet, 7 lbs.

Plymouth Rock.—The Plymouth Rock, originating in the United States, is a bird of good size and is classed as a general purpose bird. The body is long and broad and carries good fleshing properties. The skin and shanks are yellow. It is a good layer of brown eggs, and it is a good sitter. It has a single comb and red ear-lobes. The six varieties include the Barred, Buff, Columbian, Partridge, Silver Pencilled, and White. The Barred is by far the most popular variety.

The standard weights are: cock, 9½ lbs.; cockerel, 8 lbs.; hen, 7½ lbs.; pullet, 6 lbs.

Rhode Island Red.—The Rhode Island Red, originating in the United States, is a bird of good size, and, like the Plymouth Rock, is classed as a general purpose bird. The body is long and broad and is well fleshed. The skin and shanks are yellow. It lays brown eggs of a good size, and is a good sitter. It has red ear-lobes. There are two varieties, Single-comb and Rose-comb.

The standard weights are: Cock, 8½ lbs.; cockerel, 7½ lbs.; hen, 6½ lbs.; pullet, 5 lbs.

Wyandotte.—The Wyandotte, originating in the United States, is a bird of good size, with a shorter body than is found in the Orpington, Plymouth Rock and Rhode Island Red, but the body is very compact and well fleshed. The skin and shanks are yellow. The Wyandotte lays a brown egg and is a good sitter. It has a rose-comb and red ear lobes.

The standard weights are: cock, 8½ lbs.; cockerel, 7½ lbs.; hen, 6½ lbs.; pullet, 5½ lbs.

Fowls are of value in proportion to their ability to produce eggs and meat economically, and in this respect the breeds which have proven satisfactory include Plymouth Rocks, Rhode Island Reds, Wyandottes, Leghorns, and a few others. The Leghorn is a very good spring and summer layer, but the other three breeds are a little larger and hardier, and consequently, usually make better winter layers, and they also make fine roasters. While the question of breed is of some importance, the question of strain is of greater relative significance, and every effort should be made to maintain the best laying strain of the breed chosen.

Fig. 7.—Single-comb White Leghorn cockerel.

Fig. 8.—White Cornish pullet.

Fig. 9.—Light Brahma cockerel.

Fig. 10.—Single-comb Brown Leghorn pullet.

SELECTING LAYERS

A good winter laying strain can only be developed through proper selection of the best layers from year to year and the adoption of a definite line of breeding. In order to be able to select the best layers, it is necessary to have a definite knowledge of the various body characters correlated with egg production. The selection of the best layers from year to year will tend to develop a productive strain, since the hens which lay best as pullets are usually also the best layers the second year, when they are used as breeders. The selection of the best layers and the culling out of the poor layers is a profitable undertaking, particularly when combined with the proper selection of male breeders.

Constitutional Vigor.—In order that a hen may turn raw food material into meat and eggs most economically, it is necessary that she be healthy and vigorous, for heavy-egg production is a great strain upon her vitality. A six-pound hen laying 144 eggs in a year produces about three times her own body weight, while one laying 240 eggs produces about five times her own body weight. For such hard work a hen must always be in the best of health and she must be vigorous. Vigor is indicated by a bright, full eye, bright red comb and wattles, a well-developed body, and strong, well-placed legs. The poor layers, on the other hand, usually have a dull eye, narrow beak and head, an extremely long and narrow back, weak abdominal muscles, and sometimes weak legs.

Comb and Wattles.—The comb and wattles of good layers are usually fairly small and of fine texture, while those of poor layers are frequently heavy and coarse, the watties being quite pendulous.

Body and Skin.—Good layers are usually compact in body and frequently weigh a little under standard weight in the general purpose breeds, though ca should be taken to prevent too great a decrease. Poor layers, on the other hand, show a disposition to put on fat instead of making eggs so that they become over-weight. In the second year they tend to sag down behind. There is also a great difference in the texture of the skin over the abdomen. In good layers the skin is thin, pliable, and elastic as in the udder of a dairy cow, while in poor layers the skin is thick and inclined to be hard.

Pelvic Bones.—The pelvic bones have long been recognized to be of value in selecting good layers. As a pullet approaches laying condition the pelvic bones widen and when she stops laying they come close together again. The best laying hens, therefore, have pelvic bones which are three and four finger-widths apart. Also, in good layers, the ends of the pelvic bones are more pliable than in poor layers. Furthermore,

Fig. 11.—Barred Plymouth Rock No. 713, laid 216 eggs in her pullet year.

Fig. 12.—S.C. Rhode Island Red No. 448, laid 234 eggs in her pullet year and 137 as a yearling.

Fig. 13.—Determining the body-capacity of a laying hen by measuring the distance between the end of the keel and the ends of the pelvic bones.

Fig. 14.—Determining the condition of laying by measuring the distance between the ends of the pelvic bones.

there should be good distance between the ends of the pelvic bones and the keel, since the greater the distance the greater the body capacity. The keel should be of good length, but it should be straight to allow of good body capacity and to give good support to the abdominal muscles, and it should be well covered with flesh throughout its length.

PIGMENTATION.—In those breeds which have yellow colored beaks and shanks the yellow disappears in proportion to the number of eggs produced but the color comes back again when laying ceases. Therefore, the particular value of selecting the hens from July to September is based upon the color of the beak, shanks and vent because one can tell fairly well how many eggs a hen has laid. From the time the hen begins laying and as laying continues the beak fades gradually from the tip to the base. When the hen stops laying the color comes back in the opposite order, that is, the yellow appears first at the base until it reaches the tip, if the hen takes a long rest period. In regard to the color of the shanks, its fading out follows the same order as in the beak. As laying proceeds the color begins to leave at the front of the shank, and if laying continues for a long time the back part of the heel becomes white. The heaviest layers, therefore, have white beaks and shanks. Still another indication of a heavy layer is the color of the vent which gets paler the longer the hen lays.

MOULTING.—The length of time which a hen takes to moult is an indication of her laying ability. Poor layers usually moult first in the season and they get a new set of feathers rather quickly. Good layers, on the other hand, may begin to moult as soon as the poor layers, but they take a much longer time to moult, since they are producing feathers and eggs at the same time.

If the points enumerated above are taken into consideration one can pick out the poor layers and keep the good ones for breeding next year. Considerable practice is required in selection before one can say, with a fair degree of accuracy, how many eggs a hen has laid the past season. On the other hand, close observation of the birds throughout the laying season will enable one to cull closely and since the question of a hen's ability to lay well is a question of profit and loss a study of the body characters which are correlated with egg production is of great value.

In conclusion, cull out the poor layers and save the good ones, which usually have clean-cut heads, bright eyes, combs and wattles of fine texture, legs and breasts well muscled, good width between the pelvic bones and between them and the keel, pliable and elastic skin, white beaks, shanks and vents, and a tendency to moult late and slowly.

BREEDING FOR EGG PRODUCTION

The abiiity to iay eggs is inherited and it requires careful selection and the adoption of a consistent breeding policy to develop an egg laying strain. What is most needed is the development of winter layers since the majority of the eggs produced in the country are laid from March to June, and although the cost of production is low the profits are small because the eggs are worth less then than at any other time. The average farm hen should not only lay 144 or more eggs in a year, but the majority of them should be laid from November to March. Not only is this necessary from the standpoint of economical production, but from the standpoint of breeding it is highly desirable, since heavy winter laying pullets make the best breeders as yearlings.

IMPORTANCE OF MALE.—The selection of heavy producing females may not in itself improve the egg production of the subsequent flocks very much. It has been found that the male has a greater influence in transmitting the ability to lay a good number of eggs in the winter months than has the female. The hen transmits the ability to lay a normal number of eggs during the spring season, but she cannot transmit the ability to produce a large number of eggs in the winter season. This ability is transmitted by the male, but he should come from a heavy producing hen. The problem, then, is to select the heaviest winter producers and mate them with a male whose mother was known to have been a heavy winter layer. The selection of the male is very important, and it is only by using a male bred from a good winter layer that best results can be secured.

FEMALE BREEDERS.—Nevertheless, care must be exercised in the selection of the female breeders, for not only is it necessary to get a good male breeder from a heavy layer, but her eggs should be of good size and sound in shell. They should run high in fertility and in hatching power. Her chicks should be healthy and vigorous. In other words, the hen should not only be a good layer but she should be a good breeder also.

TRAP-NESTING.—This discussion on breeding would intimate that trap-nesting is necessary and, as a matter of fact, many farmers, from October to the last of February, will find it well worth while. It has been found that pullets which start to lay early are usually the best layers. Also, the pullets which lay the best during the winter months are the best layers for the year. On the average, heavy producers can be selected on the basis of egg production during the early laying season. Therefore, in order to secure the most substantial improvement in egg production trap-nesting for the winter months at least is necessary.

YEARLY PRODUCTION.—The numerous egg-laying contests have established the fact that the production in the pullet year is nearly always greater than in subsequent years. It is nearly always the case that hens which are unprofitable during the first year are still more unprofitable during the second year. Herein lies another reason for trap-nesting, the poor laying pullets can be eliminated from the flock, the good ones being saved for breeding purposes as yearling .

In summarizing the discussion on breeding for egg production the following suggestions are given as basic principles in a well directed effort towards the development of winter-laying strains:

1. All breeding birds should be selected on the basis of constitutional vigor and vitality.

2. No bird which has been known to have been ill should be used as a breeder.

3. Use as breeders such females only as have shown themselves to be high producers, since it is only from such females that there can be any hope of getting males capable of transmitting heavy-laying qualities.

4. Use only those females a second time as breeders which show a high record of performance in respect to the vitality of their chicks.

5. Use as breeders such males only as are known to be the sons of heavy laying dams, since only from such males can heavy laying daughters be obtained.

By following the above principles, coupled with progeny testing and a reasonable degree of inbreeding, a winter laying strain can be developed. In this way egg production will be greatly improved and farmers will secure the most satisfactory returns from their flocks.

PRODUCING HATCHING EGGS

Since the best criterion of ability as a successful poultry raiser is the number of matured chicks reared in proportion to the number of eggs set, it should be the aim of everyone who is rearing chickens to get

Fig. 15. Eggs undesirable for incubation; not one of these eggs is well shaped.

the best possible results. Good chicks cannot be obtained from poor eggs and success in incubation depends upon the quality of hatchings eggs produced.

FACTORS INFLUENCING FERTILITY.

Usually the earlier the season the lower the fertility. At the same time, experience has taught us that under a proper system of management a fertility of 80% can be secured when the thermometer registers below zero.

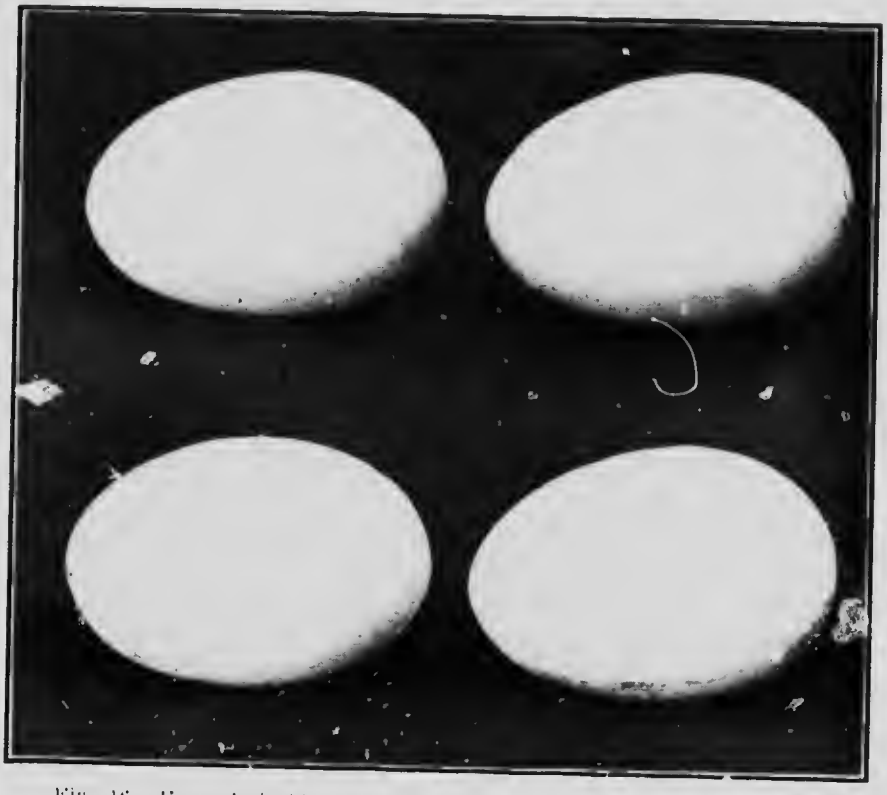


Fig. 16. Eggs desirable for incubation; they are of good size and good shape.

Breeds.—The lighter breeds, such as Leghorns usually average higher in fertility for the season than do the heavier breeds.

Matings.—Cockerels and pullets mated together usually yield the largest percentage of fertile eggs, with cockerels mated to yearling hens next, yearling cocks mated to pullets next and cocks mated to hens last. At the same time, the degree of fertility of any female varies from year to year.

Constitutional Vigor.—The vitality of poultry used for breeding purposes is of prime importance. Without the highest degree of health

poultry cannot attain the maximum in fertility. A sick bird should never be used as a breeder because constitutional vigor is the basis of success in poultry raising.

NUMBERS.—The number of fertile eggs produced depends upon the number of matings during the breeding season, which, in turn, depends, to a certain extent, upon the number of males mated to a given number of females. One male mated to a varying number of females up to about fifteen should result in a fairly consistent percentage of fertile eggs.

TIME.—The factor of time between the placing of the male birds in the breeding pen and the saving of eggs for hatching comes into play. A fertile egg may be secured one day after the time of mating a male to a female, but in the commercial production of fertile eggs about two weeks should elapse from the time the males are placed in the breeding pen. The fertility of eggs remains at a sufficiently high percentage for about one week after the males are taken out of the breeding pen.

INHERITANCE.—Fertility is not an inherited factor. The eggs of a pullet may run very high in fertility, but as a yearling her eggs may run extremely low and vice versa.

PRODUCTION.—There seems to be no correlation between egg production and fertility; a good winter layer may run high or low in fertility and a poor winter layer may also run high or low in fertility.

INDIVIDUALITY.—The individuality of the female bird is an important factor, because each female has a characteristic degree of fertility of her eggs independent, to a large extent, of the character of the male bird with which she is mated. Males also differ in respect to fertility.

SANITATION.—The general treatment given the hens affects the number of fertile eggs produced. Sanitation is essential. The fowls should be fed liberally on wholesome food and kept in houses which are dry and provided with plenty of fresh air.

FACTORS INFLUENCING HATCHING

Environmental conditions influence the hatching quality of eggs; it seems that the hatching quality is lower very early in the season than during the latter part of March and April. Many fertile eggs are allowed to become so severely chilled early in the season that the hatching quality is affected.

BREEDS.—The influence of breed upon hatching quality is most marked between extremes of breed type, such as Leghorns and Brahmas. Between breeds of the same type, such as Plymouth Rocks, Wyandottes and Rhode Island Reds, there is no noticeable difference in regard to the hatching quality.

AGE.—Pullets may be as good in the hatching quality of their eggs as hens, but great care must be exercised in the selection of mature pullet breeders in order that the vitality of the chicks may not be impaired. As far as possible yearling hens should be used as breeders.

CONSTITUTIONAL VIGOR.—The vitality of the breeders has a marked influence upon the hatching quality of the eggs; breeding birds lacking in constitutional vigor are bound to produce eggs low in hatching quality.

FERTILITY.—While the number of eggs hatched naturally depends upon the number of fertile eggs produced, yet there is a very slight correlation between fertility and hatching quality. In general, the hen whose eggs run high in fertility will also run high in hatching quality, although there are many high producers which run extremely low in hatching quality in spite of high fertility.

INHERITANCE.—There is a definite correlation between the percentage of fertile eggs hatched in the pullet year and in the second breeding year. That is, the hatching quality of eggs is an inherited character. This applies to both the male and female lines.

PRODUCTION.—There is a definite correlation between winter egg production and the percentage of fertile eggs hatched during the subsequent breeding season. It seems that the higher the winter egg production of a female the lower will be the percentage of her fertile eggs to hatch. Conversely, the lower the winter egg production of a female, the higher will be the percentage of her fertile eggs to hatch. A new phase enters into the general breeding problem; there must be developed heavy winter producers with good hatching quality of their eggs.

HOLDING HATCHING EGGS.

In general, the sooner the eggs are incubated after being laid the better. The hatchability remains fairly constant in eggs held up to two weeks. Practical experience suggests that hatching eggs should be held in a temperature of from 50° to 65° F. The best place in which to keep hatching eggs is a cool, well-ventilated cellar, where they should be turned daily.

SHIPPING HATCHING EGGS

Hatching eggs may be shipped by express or by parcel post. Whichever method is used, it is of the greatest importance to pack the eggs carefully, since careless packing is responsible for the loss of thousands of hatching eggs every season.

Eggs may be shipped in cardboard boxes or baskets, the latter being preferable. When packing in boxes, wrap each egg in paper and use plenty of excelsior in each egg compartment as well as on the top and bottom of the box. When packing in baskets, it is well to take a piece of cheesecloth, large enough to cover the contents of a full basket. Lay this cloth in the bottom of the basket so that the ends can be brought up over the top of the package when all the eggs are packed in the basket. Then, just above the cloth, put in excelsior spread evenly in layers at least one-half inch deep. Above this layer of excelsior put a piece of paper so that the ends of the paper will come up over the top of the package. Each egg should be wrapped loosely in paper and imbedded in the excelsior, which forms the packing material. Then on top of the last layer of eggs spread a half-inch layer of excelsior, cover it with paper and then draw over the cloth and sew the ends together. Now, it only remains to make sure that the package of eggs is packed firmly in the basket, and this can be done by putting in extra excelsior or extra pieces of paper around the sides and top of the package on the inside of the basket. The basket should be supplied with handles, and for the sake of safety in handling, the handles should be tied together. The basket should be labelled distinctly, preferably in red.

If eggs are packed properly the express companies have no excuse for any excess over normal breakages. Careful packing means fewer broken eggs and better hatches.

Fig. 17.—Showing the proper method of packing hatching eggs for shipment.

Fig. 18. Showing the hatching egg basket securely tied and properly addressed.

INCUBATION

The fundamental object in incubation is to secure the largest possible number of chicks in proportion to the number of eggs set. The problem of incubation, therefore, is an important one, for inefficient management during incubation would spoil hatching eggs of good quality, which would normally hatch into good strong chicks. Whether hens or incubators should be used for incubation depends largely on local circumstances. If early chicks or large numbers of them are required, then the incubator becomes a necessity. Also, there are many sections of the country where the spring season is inclined to be late and the use of an incubator and coal-burning brooder would enable the farmer to hatch chicks in time to have them develop into November layers. The increased use of the incubator is to be encouraged, since it is an important factor in the more extensive development of the poultry industry.

HATCH EARLY.—It is very important that the chicks be hatched as early as possible. Above all do not hatch late in the season. Since winter egg production is the most profitable branch of the poultry industry, and since the average general purpose chicken does not commence laying until about six months after being hatched, it is obvious that hatching should be done six months prior to November, when pullets should commence to lay. General purpose chickens should be hatched before the middle of May. Leghorns should be hatched before the first of June. Late-hatched pullets are rarely profitable.

Fig. 19.—An egg tester. The egg is held in front of the opening in the short tube to the left which is directly opposite the flame in the lamp.

SELECTING THE EGGS

Eggs to be incubated should be selected with care in order to eliminate those that will not produce profitable chicks. The standard size for a hatching egg is one weighing two ounces, and it should be oval in shape and the shell should be smooth and sound. Small eggs produce small chicks, and these should not be incubated. Eggs uneven in shape or extremely long or very short, round eggs are not suitable. Some eggs may have cracked shells, and these may be detected by the use of the tester or candler, such as is used in testing eggs during incubation. Another method of detecting cracked shells is to tap two eggs gently together, and if there is a slightly ringing sound they may be considered alright.

If there is a dull sound, one of the eggs is cracked, and should be put aside. Poultrymen should always test their eggs before putting them under a hen or in an incubator, and take out all eggs which are unlikely to produce good chicks.

NATURAL METHOD OF INCUBATION

The ability of the mother hen to hatch and rear a healthy brood of chicks is apparent whenever she steals away and in due time returns with her brood, which she raises with little or no loss.

To raise chicks with hens it is necessary to have good brooding hens, properly constructed nests, and to give careful attention during the incubation period.

Selecting Sitters.—The hen selected should have the broody instinct well developed. She should be of medium size, large enough to cover

Fig. 20.—A suitable nest for a sitting hen.

well the required number of eggs. The number of eggs in a setting varies from eleven to fifteen; eleven in the early part of the season, when the weather is cold, and fifteen later, when the weather is warmer. Breeds of the general purpose type, such as Plymouth Rocks, Rhode Island Reds, and Wyandottes are among the best sitters. The light breeds, such as Leghorns, are called non-sitters, and generally cannot be relied upon to hatch a setting of eggs.

Making Nests.—The nests should be built carefully with fine, soft hay, straw or leaves. It should be of such size and shape that the hen will fill it nicely, affording complete protection for a single layer of eggs. If the nest is deep the eggs may pile up and break. The nest should

be placed in such a position that the hen will not have to fly or jump into it. A box about eighteen inches square and about eight inches high makes a good nest. Place a sod of grass, turned upside down, in the bottom of the box and cover the sod with leaves or cut straw. The corners of the box should be well filled, and the sod should be made slightly hollow in the centre. The moist earth tends to retard the drying up of the watery content of the egg and is conducive to a good hatch.

Brooding Room.—The room for the sitting hen should be secluded, fairly light and cool. It will be found convenient and satisfactory to set a number of hens, so that they can be cared for at the same time. Where a number are sitting in the same room, it is wise to have the nests covered so that each hen will be confined to her own nest. At feeding time they can be allowed to feed together, but each hen should return to her own nest and the door of the nest should be closed. Place a dust box in the room so that the hens can dust themselves.

Time to Set.—The best time to set a hen is after dark. Have the nest carefully prepared and, if convenient, place two or three infertile or nest eggs on the nest and do not disturb her for the first day. When she is sitting well the eggs may be placed under her.

Dusting Sitter.—At the time of sitting it is very necessary to dust the hen thoroughly with insect powder. Some hens may become so badly infested with lice that they will leave their nests. To disinfect the hen, take her by the feet, holding her head downwards, and sprinkle the powder well into her feathers, then rub the powder around the joints. Dust the hen again in ten days and a third time just before the eggs hatch.

Feeding of Sitter.—The food should consist of hard grains, such as wheat, oats, corn, or a mixture of these. Where the hens are confined, green food should be given occasionally. Grit and clean water should be kept before them always.

At hatching time do not disturb the hen. Let her sit quietly after the nineteenth day, but watch her closely to see that she does not leave the nest with the first chick which she hatches. She should be allowed to remain on the nest for a few hours after all the chicks are hatched.

ARTIFICIAL METHOD OF INCUBATION

There are various types of incubators manufactured, but the principle of supplying heat to the egg chamber is essentially the same in all makes. There is, however, considerable difference in the quality of construction among the various makes of incubators, the standard makes always proving most satisfactory. There are many machines placed on the market which may hatch successfully for one or two seasons and then become practically worthless. Such have been constructed of cheap materials, have not been put together very well, and cannot be relied upon

to give satisfaction season after season. It is wise to avoid inferior makes and to secure a durable and efficient machine.

LOCATION OF INCUBATOR.—A cellar or semi-basement about four feet below and about three feet above ground is a good location for the incubator. The room should be well ventilated but free from draughts. The floor of the room should be clean. The temperature should be fairly constant, so that the heat of the incubator chamber will not be affected too much.

STARTING INCUBATOR.—The incubator should be started a few days before the eggs are to be placed in it and the heat regulator should be properly adjusted so that an even temperature may be maintained.

Fig. 21. Showing chicks in the incubator in which they were hatched.

TEMPERATURE.—The temperature on a level with the tops of the eggs as they lie upon the trays should be 103 F. throughout the twenty-one days of incubation.

CARE OF LAMP.—An important factor which has to do with the maintaining of a uniform temperature is the flame. The lamp requires to be filled with oil every morning. The wick should be trimmed at the same time, in such a manner as to give a broad, even flame, the corners of which are slightly rounded. When a new wick is to be used, the rough edges should be burned off by holding the end of the wick in the flame of a lighted match. The proper method of trimming the wick is to rub off the charred portion with the fingers and then light it. If an even flame does not show when the wick is turned up, remedy the

Fig. 22.—An egg where the vitelline membrane, surrounding the yolk is broken, and the yolk is intermixed with the albumen, thus preventing hatching.

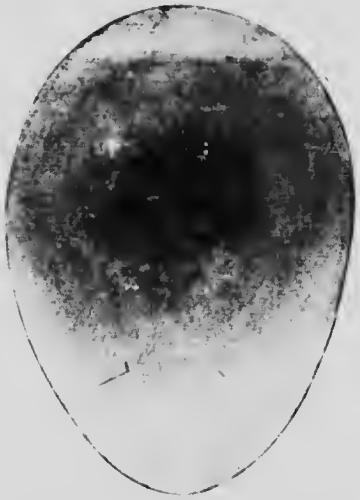


Fig. 23. An infertile egg, which shows no development of the chick.

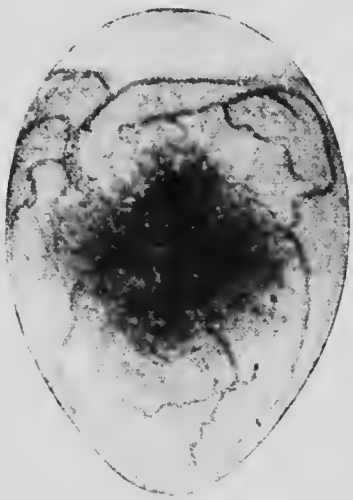


Fig. 24.—A fertile egg on about the seventh day of incubation, showing development of the body and blood vessels of the chick.

Fig. 25.—A fully-formed chick after twenty-one days of incubation.

defect and be very sure to round off the corners of the wick so that no smoking will result. The lamp should be attended to after the eggs are turned and aired in the morning.

Turning Eggs.—During incubation the eggs require to be turned. This should begin on th third and continue until about the eighteenth day. For all practical purposes turning twice each day is sufficient. The best method is simply to "shuffle" the eggs; that is, to remove a few eggs from the front of the tray as it rests on top of the incubator, then roll the rest of the eggs forward, and place those taken off at the back of the tray.

Ventilation.—For good results the eggs must be given fresh air, and the circulation of the air through the incubator chamber should be rapid enough to supply sufficient oxygen for the living embryo. Some incubators are supplied with automatic ventilation. With those incubators which are equipped with ventilating devices, the ventilators should be kept closed during the early period of the hatch and gradually opened as it proceeds.

Moisture.—Artificial moisture should be supplied from the beginning of the hatch, in order to prevent excessive evaporation of the watery content of the egg. Some incubators are equipped with moisture trays, while in others a shallow pan or dish may be filled with water and set in the bottom of the incubator chamber. Results have shown that an atmosphere of about 65 per cent. humidity is best. The use of moisture in incubation gives larger hatches and stronger chicks.

Testing.—A fertile egg will show signs of development when incubated for a few hours. An infertile egg shows no signs of development during incubation. To determine whether an egg is fertile or infertile, it is tested with the egg tester or candler. The condition of the egg may be seen when it is placed between the light of the tester and the eye. Testing is done on the seventh and again on the fifteenth day. The first test is for the purpose of removing all infertile eggs and blood-rings (eggs in which the germ has died during the early part of incubation). The second test is to eliminate from the incubator all eggs whose embryos have died since the first test.

Hatching Time.—While the chicks are hatching it is wise to keep the incubator chamber dark. This will tend to keep the chicks quiet, and they will not be inclined to crowd to the front of the incubator. It is advisable to keep them on the egg tray until they are well dried. They should not be removed from the incubator until about thirty hours after the last chick has hatched. The flame of the lamp should be lowered gradually while the chicks are hatching, for they give off considerable body heat. If they start to pant, open the door of the incubator a little to give ventilation. While they are kept in the incubator, the temperature should be lowered gradually, as in this way they are prepared for the brooder.

SHIPPING CHICKS

Strong cardboard boxes are used for shipping chicks, the size of the box depending upon the number of chicks to be shipped. The boxes are usually made up to hold twelve, twenty-five, fifty or one hundred chicks, those holding twenty-five or more being divided into compartments. Small holes are punched in the sides to admit fresh air.

The method of packing and shipping the chicks is simple and they may be shipped about 2,000 miles with safety. The chicks are taken from the incubator, when about one day old, and without being fed or watered are placed in the shipping boxes, in the bottom of which has been placed a little bran to keep the chicks' feet from slipping. The cover is fastened on and the box is tied firmly and addressed legibly.

Fig. 26.—A serviceable hatching and brooding coop.

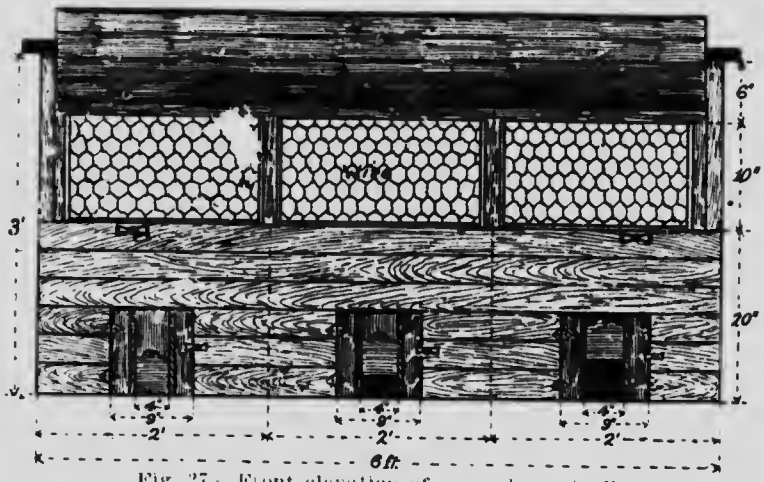


Fig. 27.—Front elevation of coop shown in Fig. 26

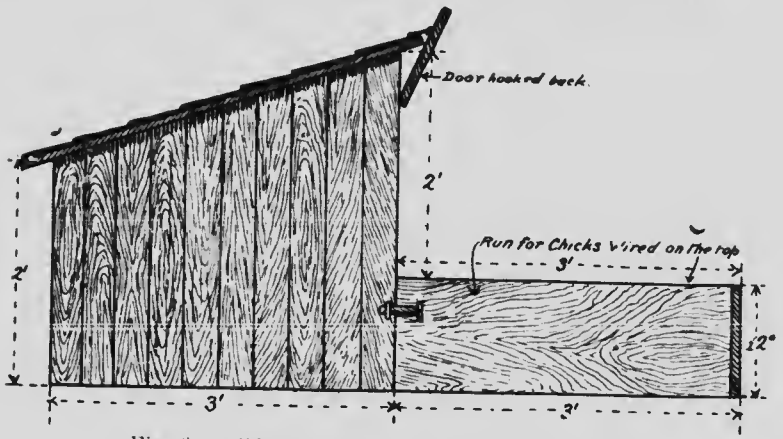


Fig. 28.—Side elevation of coop show ig. 26.

BROODING

Given healthy and vigorous chicks as they come from the incubator, it is essential that the conditions of brooding should be such as to promote the most economical growth. The most important factors in brooding, whether artificial or natural, are proper temperature, plenty of room and sanitation. In natural brooding, however, the factor of temperature is controlled by the mother hen, and owing to the fact that a hen can only accommodate a limited number of chicks, there is little or no danger of overcrowding. It is because of these conditions in natural brooding that chicks usually grow better than those brooded artificially. At the same time, chicks in large numbers are being raised very successfully artificially, particularly since the introduction of the coal-burning brooder. The use of such a brooder has reduced the cost of brooding and lessened the amount of labor required, and its use should be of particular value where there is a late spring season.

NATURAL METHOD OF BROODING

The brooding of a limited number of chicks with hens is much easier than brooding them with artificial brooders. A good broody hen which has hatched her chicks successfully, will usually take good care of them. The average hen will brood from ten to fifteen chicks quite successfully.

One of the first things that should be done is to make sure that the hen and chicks are entirely free from lice. Dust the hen thoroughly with insect powder.

Brooding Coop.—During the first two or three weeks, it is advisable to keep the hen confined in a coop. The little chicks should not be allowed too much freedom at first, nor should they be allowed out of the coop while the grass is damp with dew or rain.

It is advisable to make the coop as serviceable and economical as possible. Avoid making a lot of cheap coops which in a short time become useless; this is a common mistake on many farms. The most serviceable coop is one which serves to brood the chicks and to house them during the growing season.

Clean Soil.—Yards and fences are not necessary, except where a large number of chicks are being brooded at the same time. The coops may be placed in different parts of the orchard and fields, and in this way the chicks are given free range on clean soil. It is important to avoid keeping a large number of chicks on the same ground year after year. By keeping the soil sweet and clean, the chicks can usually be kept in good health.

Fig. 29.—A portable lamp brooder.

Fig. 30. An oil-burning brooder.

ARTIFICIAL METHOD OF BROODING

Warmth is the first requirement of young chicks, and when the chicks are placed in the brooder the temperature should be about 98° F., on a level with the chicks, and this should be lowered gradually from week to week, depending on the season. In the early season the chicks will require brooding at a higher temperature for a longer time than later on. Chicks that are hatched between the first of April and the middle of May should be brooded for about eight or ten weeks. It is most important to watch the chicks closely the first few nights after being placed in the brooding quarters to see that they do not get too far away from the source of heat or do not pile up in one corner of the room. The latter is disastrous and should be avoided at all costs. Put pieces of board across all corners of the house so that there are no square corners. Care should be taken not to drive the chicks away from the brooder by too much heat nor cause them to crowd together under the brooder by too little heat. When chicks are most comfortable they flatten out just around the edge of the brooder. During the first two days they should not be allowed more than two feet away from the brooder; then a little farther away each day until at the end of a week they have the entire run of the brooder room.

Overcrowding Dangerous.—There are few conditions so disastrous to chick rearing as overcrowding. As an individual, a healthy chick may be quite robust, but when placed with one hundred other chicks it may have a small chance to attain normal growth. The larger the number of chicks brooded together, the smaller are the chances for any of them to grow properly, and the greater the risk of loss of life. Ordinarily the number of chicks to be brooded together should not exceed 50, but there are some exceptions to this, for with very careful management, particularly in regard to heat, about 150 can be brooded together.

Lamp Brooders.—Many farmers will find the lamp brooders quite satisfactory for raising a few hundred chicks. These small circular brooders are adapted for brooding about 50 or 150 chicks, depending upon the size. They are portable and may be placed anywhere in any building. They are convenient and usually give good satisfaction, providing the wick is kept properly trimmed and the lamp is kept clean. Care should be taken to see that the chicks go under the hover the first few nights, otherwise they may catch a chill. The brooders should be used for eight or twelve weeks, depending upon the season and the condition of the chicks. During the latter part of the brooding season the lamp may need to be kept lighted during the night only. In this way the chicks are gradually weaned from heat, after which the brooders may be removed from the house and roosts put in.

Coal Brooders.—The most efficient brooder for brooding about 150 or more chicks is the coal-burning brooder. There are a number of good makes on the market, and in most cases they are simple to operate and

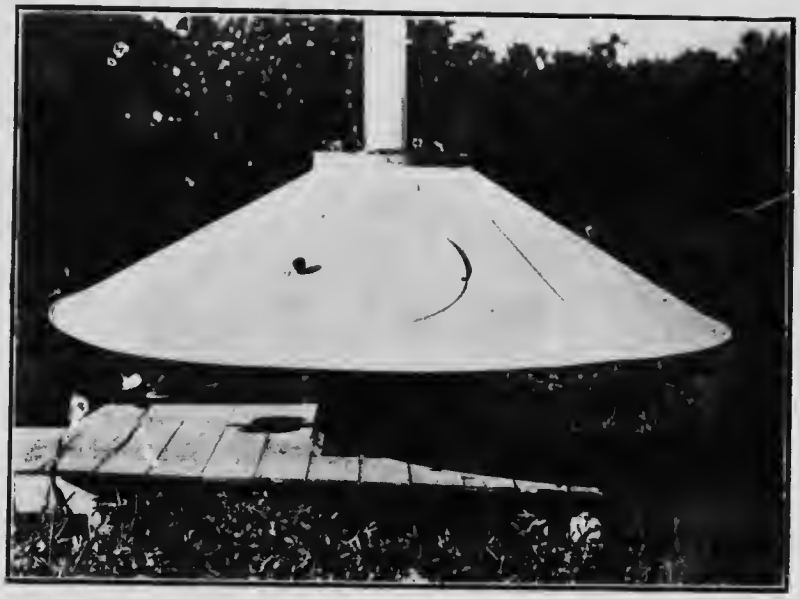


Fig. 31. A coal-burning brooder with hover down.

Fig. 32.—A coal-burning brooder with hover raised.

give satisfaction. They are small brooders which may be moved from year to year, although they are usually left in one house for some time. They accommodate from 100 to 500 chicks each for the smaller size, and from 300 to 1,000 chicks each for the larger size. Each brooder is simply a small stove with a movable hover attached, arranged so that it can be raised or lowered according to the amount of heat required for the chicks. They are not expensive to operate, and save a great deal of time in caring for the chicks. They are particularly good for farmers who raise about 300 or more chicks annually, and there are many farmers who, under modern conditions of incubation and brooding, would find raising 300 chickens quite profitable.

Brooders are often placed in portable houses, which can be moved from one field to another, or they can be located in different parts of the orchard each year. In this way the chicks are raised on fresh soil and will always grow faster. A cultivated field where a certain amount of green food is available is an almost ideal place for growing chicks. They require plenty of shade and freedom, and overcrowding them on a small area of land will not allow them to develop properly.

Fig. 33. A convenient and serviceable house for brooding and raising chicks.

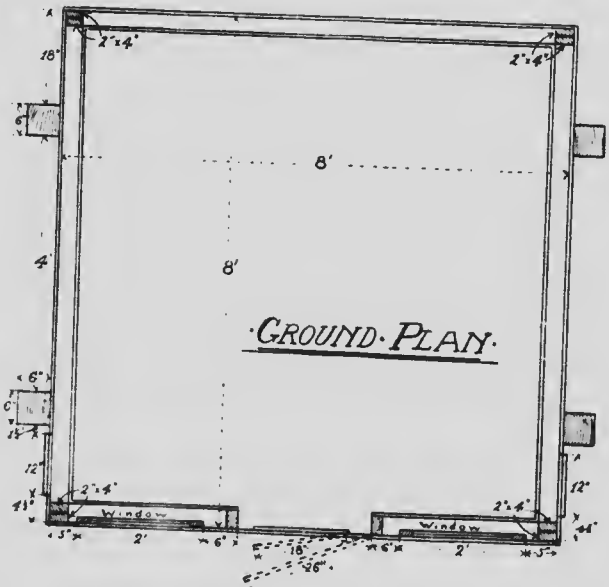


Fig. 34.—Ground plan of house shown in Fig. 33.

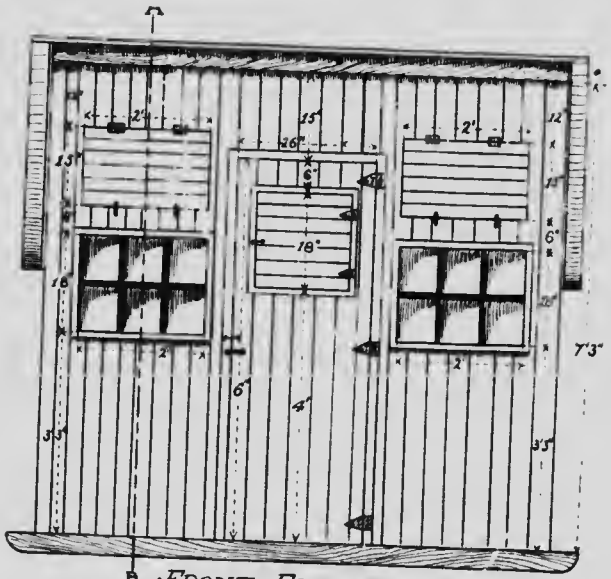


Fig. 35.—The small ventilating door shown in this sketch is different from the door shown in Fig. 33 and probably will tend to check any draught on the floor.

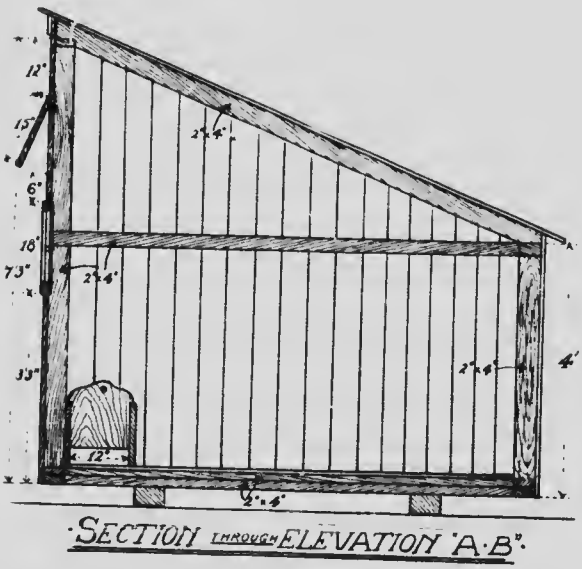


Fig. 36. Side elevation of house shown in Fig. 33.

Fig. 37.—An A-shaped brooding and rearing house.

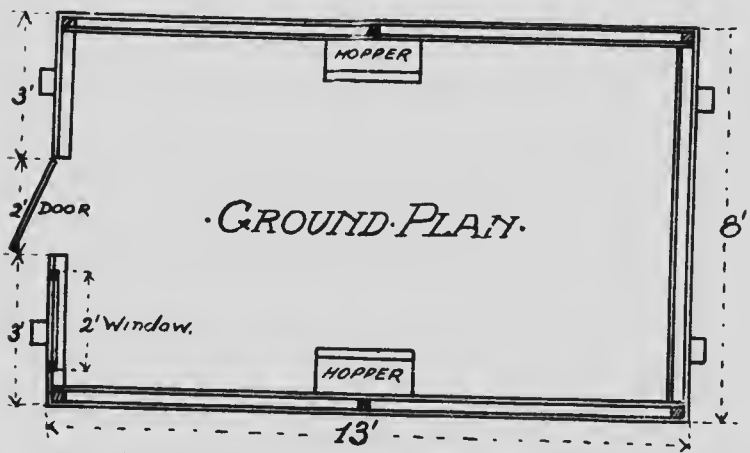


Fig. 38.—Ground plan of house shown in Fig. 37.

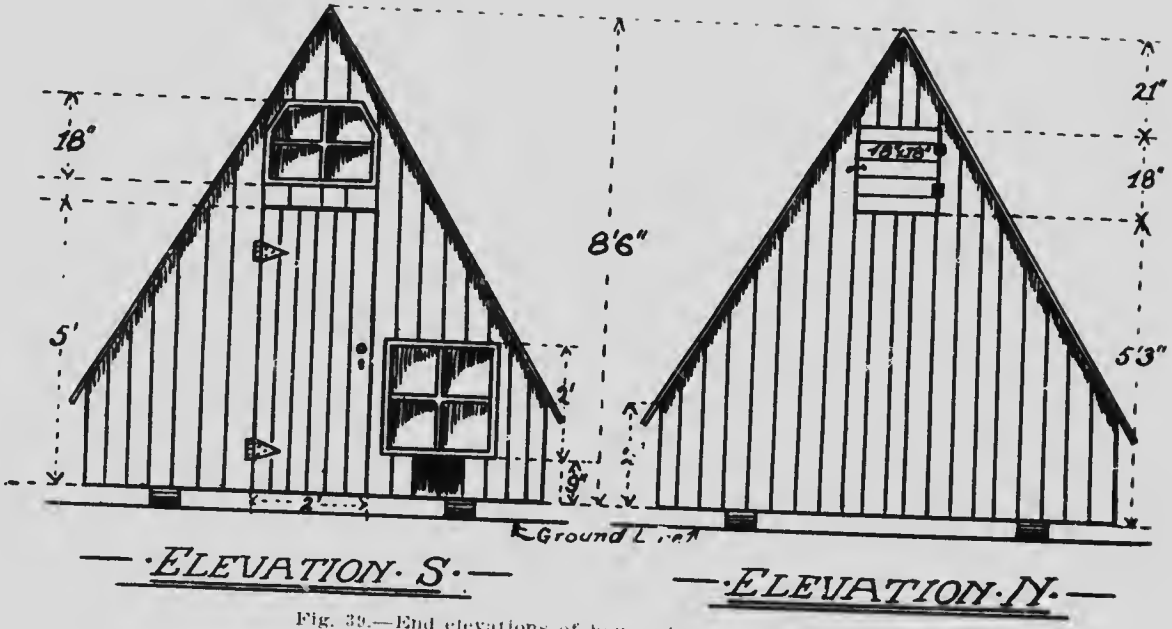


Fig. 39.—End elevations of house shown in Fig. 37.

REARING

Great care must be taken from the time the chicks are weaned from the heat of the brooders until they are almost matured to see that they develop properly. Faulty conditions may so retard growth as to affect the vitality and vigor of the stock. The chicks must be kept developing at a normal rate throughout the growing season.

Chick Houses.—The houses in which chicks are brooded and reared should be such as to promote the most efficient growth. While they should provide ample protection from the weather, they should also be well ventilated. Chickens do not do well if kept in houses where the atmosphere is stuffy. At the same time there should never be a direct draught passing through the house. The main object should be to make the house as comfortable as possible for all occasions.

The houses should be convenient and economical. Each house should be large enough to accommodate about 50 matured chickens, without crowding. A house, six by eight feet, will do this nicely, although the same house would accommodate 100 or more chicks with the brooder. A house eight by twelve feet would accommodate at least 150 chicks and 75 mature chickens. After the chicks are ten or twelve weeks old their numbers should be decreased gradually until there are not more than 50 or 75 left in the house. After the chickens are about twelve weeks old roosts should be placed in the houses. The floors should always be covered with about two inches of fine, clean litter. Above all, have the houses well ventilated, keep them sweet and clean, and do not overcrowd the chickens.

Separate Different Ages.—Chicks of different ages should not be raised together. The older ones will crowd the younger, and poorly developed chickens will result. Raise the growing stock of various ages in separate flocks, as it is only in this way that a majority of good, mature birds can be obtained.

Separate the Sexes.—Separation of the chicks according to sex is also necessary. The time for separating varies according to the breed; cockerels of the lighter class, such as Leghorns, should be removed from the pullets when six to eight weeks old, while cockerels of the general purpose class, such as Plymouth Rocks, may run with the pullets a little longer.

The Pullets.—The pullets intended for laying are kept by themselves. They must be given proper treatment to ensure their being in good laying condition at the proper time. Pullets should be ready to lay about the middle of October or the first of November.

The growth of the pullets to maturity should proceed without interruption, because a check to growth at any stage retards laying at

maturity. Influences which are unfavorable to the development of the body will also be unfavorable to the proper development of the reproductive organs, upon which egg production depends. Free range on clean soil, with plenty of green food and shade, are essentials for good growth.

Avoid disturbances to the flock. The growing pullets should be kept in the same place and under the same conditions as far as possible. If the pullets are moved several times during the growing season, it will undoubtedly retard normal growth and egg-laying at maturity. They should receive regular treatment and careful handling at all times, for young pullets are very sensitive to strange objects and conditions.

In the fall of the year, the pullets are moved from their summer to their winter quarters. This is necessary because the pullets should be raised on free range and on different parts of the farm each succeeding year. In order that the pullets may lay by the first of November, they should be in their winter laying quarters by about the middle of September. They will then have a good chance to settle down and become acquainted with their new conditions. The moving of the birds should be done as quietly as possible.

Every care should be taken to select the best pullets for the laying pen; they should be well matured and in good, healthy condition. A diseased or an unthrifty bird should never be placed in the laying flock. Every effort should be made to keep up the constitutional vigor and vitality of the layers, if good egg production is to be secured.

The Cockerels.—The cockerels which are reserved for breeding purposes must be kept separate from the pullets, but they are given the same general treatment. Good growth and sound constitution are the essentials in the rearing of breeding cockerels. The cockerels should be well developed and well matured before being placed with the females for breeding purposes.

The cockerels which are to be sold as roasters in the fall of the year, after being separated from the pullets, are kept on free range and induced to grow as large frames as possible. Quick growth and good size are the essentials in rearing roasters.

The chickens, usually cockerels, which are marketed at an early age, eight to twelve weeks, are called broilers. Since early maturity is highly desirable in order that plenty of meat may be produced, not only must a suitable breed be kept, such as the Leghorn, but careful attention must be given to the broilers just previous to marketing. Cockerels to be sold as broilers are culled out of the chicken flocks at about eight weeks of age and are kept separately and fed on a special fattening ration. Otherwise they are treated much the same as other chickens.

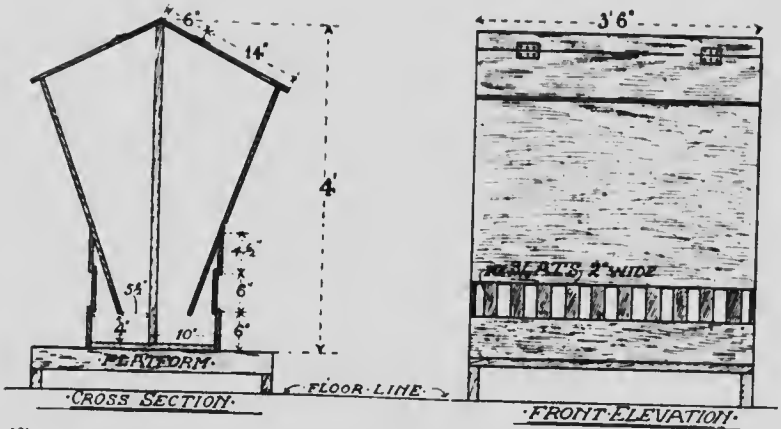


Fig. 40.—Showing construction of an outdoor hopper for dry mash or whole grain.

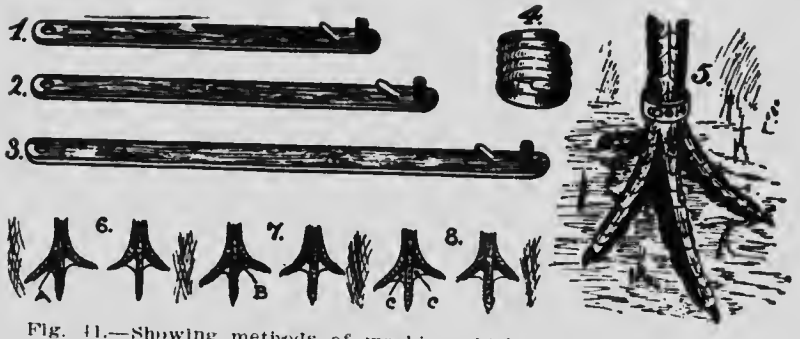


Fig. 41.—Showing methods of marking chicks. Nos. 1, 2, and 3 show different sizes of leg bands for different sizes of birds. No. 4 shows a colored celluloid leg band. These bands may be used to distinguish fowls of various ages. No. 5 shows a numbered leg band on the leg of a fowl. These bands are used in breeding work. Nos. 6, 7 and 8 show three pairs of chicks' feet, illustrating the various ways in which the webs of the feet are punched. Pair No. 6 is punched in the outer right web at A. Pair No. 7 is punched in the inner right web at B, and pair No. 8 is punched in the outer and inner right webs at C. Poultry can also be marked very effectively by inserting a band in the wing. This method is permanent and is one of the most effective methods employed.

FEEDING THE CHICKS

The essential feature in feeding chicks is to feed them frequently, but only a small quantity each time. It is absolutely imperative that chicks be not allowed to overeat. Chicks will do best if for the first two weeks they are kept very hungry, so hungry, in fact, that they seem to be suffering from partial starvation. For the first few weeks it is advisable to feed them five times daily, and while variety is essential it is wise to have the rations as simple as possible.

First Feed.—Chicks should not be fed until they are about thirty-six hours old. Indigestion and bowel trouble often result from feeding too soon. A little grit, clean water and sour milk should be given first.

Fresh Water and Sour Milk.—It should be borne in mind that fresh water should be given the chicks every day. If sour skim milk can be obtained, it should be given regularly for it is one of the best poultry foods we have. It seems to keep the digestive tract of the chick in good condition, and does much to combat white diarrhœa.

Green Food.—Green food is very valuable. When chicks are on free range they usually get enough green food, but where they are confined in runs, or where the grass is brown, some green food, such as cut clover, lettuce or sprouted oats, should be given every day.

Mineral Food.—It is well to keep grit and oyster shells in hoppers before the chickens all the time.

METHODS OF FEEDING

The following two methods of feeding chicks have given general satisfaction:

Method No. 1.—The first grain feed given should be a dry mash made up of some of the ground grains. A good mash is made up of four parts of bran, four parts of oatmeal feed, two parts cornmeal, one part middlings, one part beef scraps and one part chick grit. All these parts are by weight and the different materials are mixed thoroughly. This mash is fed to the chicks three times a day, morning, noon and evening, for several days. During the same period the chicks are fed in the middle of the forenoon a mixture of four parts bread-crumbs and one part hard-boiled egg, and in the middle of the afternoon they are fed oatmeal. That is, the chicks are fed five times every day, and this rate of feeding is continued until the chicks are about twelve weeks old. The order of feeding is mash in the morning, bread and egg mix-

ture in the middle of the forenoon, mash at noon, oatmeal in the middle of the afternoon and mash in the evening.

When the chicks are about one week old, the mash feed at noon is changed for a feeding of finely-cracked corn and wheat or a good brand of chick feed, which can be purchased on the market. When the chicks are about two weeks old, the bread and egg mixture, as well as the oatmeal feeding, is replaced by a moistened mash feeding. At the same time the mash feedings which were being given in the morning and evening are replaced by feedings of cracked corn and wheat. The cracked grain is scattered in the cut straw or chaff on the floor of the house. That is, now the chicks are getting cracked grain in the morning, mash in the middle of the morning, cracked grain at noon, mash in the

Fig. 12.—A good colony house located in an ideal place for rearing the young stock.

middle of the afternoon, and cracked grain in the evening. This method is continued until the chicks are about twelve weeks old.

When the chicks are six or eight weeks old it is well to place some mash in a dry form in a feeding box or hopper so that the chicks can help themselves at any time. A good dry mash is composed of three parts bran, two parts oatmeal, two parts cornmeal, one part middlings, one part beef scraps and one per cent. charcoal. These parts are by weight, and the materials are mixed and placed in feeding hoppers in a dry state. The hoppers are left open so that the chicks can help themselves at any time.

When the chicks are about twelve weeks old they are fed cracked corn and whole wheat in the morning and afternoon and moistened mash at noon. This method is continued until the fall of the year, when the

cockerels are ready to be fattened and the pullets are ready to be taken to the laying houses.

METHOD No. 2.—Early in the morning the chicks are given in the litter a mixture of hard grains composed of fifteen parts cracked wheat, fifteen parts fine cracked corn, ten parts pinhead oats, three parts chick grit and one part fine charcoal, all parts by weight. In the middle of the forenoon the chicks are given a dry mash of the following composition: two parts wheat bran, two parts rolled oats, two parts cornmeal and one part beef scraps, all parts by weight. This is given dry on flat boards and the boards are removed in ten minutes. At noon the first mixture of hard grains is fed again and in the middle of the afternoon the dry mash mixture is fed again. Late in the afternoon the hard grain mixture is fed for the third time and about half-an-hour before bed time the dry mash mixture is placed before the chicks.

By this method they are fed six times daily, but only enough at each time to satisfy their appetites for the time being. It is desirable to have their crops empty of feed before feeding them again. This method is continued for three weeks when the only change made is to leave out the pinhead oats from the hard grain mixture. Otherwise the method is continued to about five weeks when the minor change is made of increasing the third feeding of the hard grain mixture and doing away with the late dry mash feeding. From about five weeks to about twelve weeks the chicks are fed five times daily, dry mash being before them in hoppers and the two original dry mash feedings being now given slightly moistened with water or with sour milk, if it can be obtained.

After twelve weeks the method of feeding is the same as in method No. 1.

The chick grows very rapidly, and it requires to be fed well. Above all, ould not be fed too much at any one time, and it should be indu. . to take plenty of exercise. Free range conditions produce healthy chicks and cut down the cost of feeding.

FEEDING THE BROILERS

Broiler raising as a specialized business can be carried on successfully by comparatively few people. Those in close proximity to the better markets of the cities sometimes make good profits, but the average farmer is not in a position to take advantage of the market situation in the early season.

In order to make the largest profits in raising broilers, an early maturing strain of fowls must be used. The Leghorns and other light breeds mature faster than do the heavier breeds, and are thus better suited for the production of squab and medium broilers. All white

Fig. 43. S. C. White Leghorn cockerels make fine broilers.

feathered birds look better when dressed than do those with dark feathers.

Fattening. Chickens intended for broilers are reared with the rest of the chickens until a short time before they are marketed. Under proper management the chickens will grow rapidly. When they weigh about one pound each they should be put into small yards or pens, though care should be taken to avoid overcrowding. Where a large number of broilers are being fattened, they may be put in fattening crates. At this age they will tend to grow more than to fatten, but a little fattening food while in confinement will produce more meat and the quality will be improved. The first feed given after they are confined

should be their growing ration while on range. This should be gradually changed to a more fattening ration. A good ration consists of equal parts oatmeal feed, cornmeal and ground buckwheat, to which has been added ten per cent. of beef scraps. These ground grains should be thoroughly mixed and then moistened with sour milk. The wet mash is fed in troughs three times daily, giving the broilers all they will eat at each feeding. If sour skim milk is not available, water may be used. Low grade flour or wheat middlings may be substituted for the ground buckwheat.

At the end of the fattening period, which should last for two or three weeks, the broilers should be fat and plump. They may be sold alive or dressed, depending upon market prices and facilities for killing and shipping.

Fig. 45.—A bird with a well-shaped body and vigorous constitution representing the type which makes profitable feeders.

Fig. 46.—Showing how the bird in Fig. 45 dresses out for market. Notice particularly the fleshing over the breast and keel, and the plump thighs.

Fig. 47.—A bird with a weak constitution and poor feeling qualities.

Fig. 48.—Showing how the bird in Fig. 47 dresses out for market. The fleshing is extremely poor and it lacks quality.

FEEDING THE ROASTERS

Under present conditions of food production and the need for economy in consumption, it becomes imperative that every effort should be made to produce stock of such good quality that there will be the minimum waste. The general public is so accustomed to purchasing dressed poultry of poor quality, that it usually does not recognize the difference between a poor roaster and a well-finished one. If poultry is well fattened, properly killed and dressed, there are few kinds of meat so wholesome and with such good flavor.

Poultry meat is very similar in composition to other kinds of meat, but it is finer grained and more tender. It does not contain as much

Fig. 44.—Fattening house with fattening crate in foreground.

fat as other meats and as a result furnishes less energy to the body when consumed, but it does contain more building materials needed for the body. In regard to digestibility, it compares well with other meats, and since it is considered more palatable, it will always be used in large amounts.

FATTENING.—A roaster of the highest quality is one which is young, full grown, plump and well finished. On the other hand, a thin bird is not attractive when dressed and is not appetizing when roasted. The flesh appears shrunken and the bones are prominent and the meat is

Fig. 49. Interior of fattening house, showing arrangement of crates.

Fig. 50.—A fattening crate.

dry and tough. The fattening of poultry, then, is a finishing process. The object in fattening is to prepare in the best possible way poultry flesh for human consumption. Plump birds are in the greatest demand at highest prices, and birds of high quality always yield the largest profits. Fattening, then, means heavier birds and higher prices. There

Fig. 51. A fattening battery

is usually a difference in price of five cents or more a pound between thin and plump poultry.

Rations. Best results are obtained by feeding all fattening birds on soft mashes. The gain in weight is greater and the quality of the flesh is superior when wet mashes are used than when the chickens are fed whole grain. The ground grains used to make up the mashes

are usually oatmeal feed, finely ground buckwheat and cornmeal, low grade flour and middlings. Various mixtures of these grains give satisfaction, but the actual price of each grain at any particular time determines its value as a fattening food. With a ration composed of two parts cornmeal, one part ground buckwheat, one part middlings and five-eighths parts beef scraps, all parts by weight, one pound of gain in weight may be obtained with four pounds of grain. These ground grains should be mixed thoroughly and the mixture moistened with sour skim milk. Milk is an excellent food for fattening chickens. It tends to develop the tissues and improves the quality of the meat. The proportion of milk to the mash mixture is about two pounds of milk to one pound of mash. Best results are secured when the food is mixed twelve hours previous to feeding. Give the birds grit once a week during the fattening period.

TIME.—Great care should be taken not to feed the birds too much during the first four days of the two-week fattening period. Feed very lightly three times per day for the first four days, then for the last ten days give them all they will eat three times per day, but do not leave feed before them.

PEN FATTENING.—There are two methods of fattening poultry for the market. The method usually employed on the farm is the pen method, where the birds are confined in a pen or box-stall. The other method is crate fattening, and is usually more profitable.

CRATE FATTENING.—The fattening crate is made of laths nailed upon a stout frame-work, with a few light boards for the ends and partitions. The crate should be six feet long, and eighteen inches wide and eighteen inches high. The laths on the top, back and bottom, run lengthwise of the crate and are placed two inches apart; care should be taken to have front and back slats on the bottom at least one inch from the front and back sides of the crate, so that droppings may pass through and not accumulate. The laths on the front of the crate run up and down and are placed two inches apart, so that the fowls may eat from the trough. A V-shaped trough, three inches deep and five inches wide at the top, is placed on brackets which are placed four inches from the bottom of the crate. The crates should stand on legs about three feet high.

The fattening crates should be placed in a cool, comfortable place, and where the birds will not be disturbed. The birds should be dusted with powder to rid them of lice and mites, otherwise they will not fatten most profitably.

GAIN.—Under average conditions a chicken will gain about one pound in weight after two weeks of careful feeding. A heavier bird at an increased price per pound means greater profits to producers and better satisfaction to consumers.

FEEDING THE LAYERS

In order to get the greatest returns from the feed supplied, the laying stock must be of the highest quality from the standpoint of egg production. It is only in this way that a satisfactory winter egg production can be secured.

The usual advance in the price of eggs, particularly fresh eggs, during the fall of the year, is due largely to natural causes. The moulting of the yearling stock shuts out this source of production, leaving pullets practically as the only source of fresh eggs at this time. Pullets, particularly of the heavier breeds, do not generally commence laying before they are fully matured, and if, for any reason, the majority of the pullets have been late hatched or have not been cared for properly during the growing season, a scarcity of fresh eggs is bound to result. Therefore, the greatest hope of increasing the fresh egg supply in the fall lies in the proper handling of the pullets during the growing season. A larger fall and winter production means larger profits to the producer and a more stable market for the consumer.

MATURITY.—The pullets must be fully matured before commencing to lay and they must have well developed bodies. Undeveloped and immature pullets are very prevalent in many farm flocks during October and November. If a bird is to lay well throughout the winter months she should start laying about the first of November, just as cold weather is approaching. All pullets should be well matured by about the first of October and they should be put into their laying pen about the middle of September, in order that they may be accustomed to their new place and changed conditions when ready to lay. Unless the birds are fully matured, eggs cannot be expected in any number before the first of the year. Well matured pullets of good health and vitality should be the first consideration in building up a laying flock.

EXERCISE.—Maximum egg production is largely controlled by the method of feeding as well as by the nature of the foods given. One of the prime factors in feeding is to compel the birds to take plenty of exercise. The litter in the house should be about ten inches deep, and the whole grain should be scattered in this whenever it is fed. It is a good practice to stir up the litter frequently with a fork. This will prevent the straw, or whatever is used for litter, from becoming packed down solid, and will also compel the birds to scratch for the grain.

THE NUTRIENTS.—Water is of particular value in poultry feeding. It softens the feed, which aids in digestion; it serves as a solvent for several compounds; it is a carrier of nourishment to the body and of waste material from the body. Over one-half of the egg and the body of

the fowl is made up of water, consequently a liberal supply of water is absolutely necessary.

The chief function of the ash is to supply the growing bird with mineral matter for the production of bone and feather and for the manufacture of eggs shells. Oyster shells provide the calcium contained in egg shells.

Protein is a flesh forming substance and is essential for the production of lean meat, muscles, eggs and other substances. Beef scraps, fish scraps and other concentrated feeds are rich in protein and are thus necessary to balance the ration.

Carbohydrates supply fuel to keep the fowl warm. They also supply material for the production of energy for muscular work. In some cases

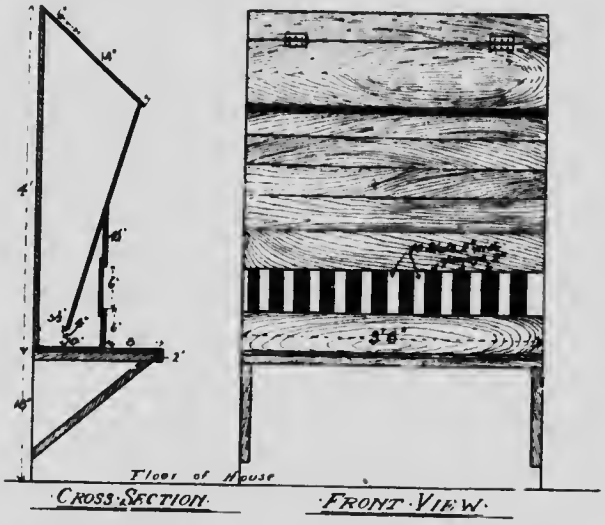


Fig. 52.—Showing construction of an indoor hopper for dry mash.

they are transformed into fats and stored as such in the fowl's body. Corn, wheat and oats are rich in carbohydrates and should provide the bulk of the poultry ration.

Fat furnishes fuel to produce energy and to keep the fowl warm. It also aids in the production of fatty tissue. Corn, because it is relatively rich in fat, is a particularly good winter food for laying hens.

Food Requirements.—The rapid growth of poultry demands relatively larger quantities of food than are used by other classes of live stock. Also, poultry require larger proportions of concentrated food, that is, there must be more protein in proportion to the carbohydrate and fat than is necessary in feeding other animals. On the other hand, poultry require relatively large amounts of carbohydrates. As compared with other animals, poultry digest very little crude fibre. For

both growth and egg production, mineral matter is required in much larger proportion than in the diet of other animals.

METHOD OF FEEDING.—The morning feed consists of whole grain, wheat or corn, or a mixture of these with oats scattered in the litter. Just enough grain is given to make the birds scratch for at least one hour in the litter. Care should be taken to avoid overfeeding or the hens will get sluggish. The noon feed consists of very small quantities of a slightly moisten d mash composed of ten parts wheat bran, six parts crushed oats, five parts cornmeal, three parts middlings, three parts beef scraps and one part charcoal, all parts by weight. At night all the whole grain is fed in the litter which the birds will pick up clean before going to roost. A dry mash of the same mixture as given above is fed in a self-feeding hopper, which is kept closed until about noon.

Green food is usually fed at noon. Grass can be obtained during the spring and summer but it cannot be obtained in winter. Sprouted oats make the best form of green food. Mangels are easily grown and are cheap, and they are well liked by fowls.

Grit and oyster shells are placed in self-feeding hoppers.

Clean water should be provided every day and sour skim milk, when it can be obtained, should also be suppiled in pans.

No mention has been made of any definite amounts of grain or other foods to give. The reason for this is because it is impossible to say how much the fowls require from one day to another. They consume more one day than another, and the quantity of any particular food required depends upon the method of feeding. The best feeder is one who observes the fowls very closely and is able to feed according to their daily needs. Another point which should always be kept in mind is that the prevailing price of any grain will determine whether it should be used or not.

HOUSING THE LAYERS

There are general principles which apply in all cases of poultry-house construction but, at the same time, local conditions determine, to a large extent, the exact type which will give good results.

Comfort.—The first essential feature in housing is comfort for the birds; unless they have comfortable quarters they cannot be expected to lay well. A comfortable house implies that it provides plenty of room for the birds, is well supplied with fresh air and, at the same time, is always dry. The condition of dryness in a house depends upon the circulation of fresh air. While an abundant supply of fresh air at all times is essential, it is very important that no draughts be allowed to sweep through the house.

One of the surest indications of an improperly ventilated poultry house is the condensation of moisture on the walls and ceilings. Moisture is given off by the fowls in breathing and this foul air, which contains carbon dioxide as well as other injurious gases, falls to the floor, and if it is not carried off regularly the atmosphere of the house becomes excessively damp, and during cold weather this dampness collects upon the walls and ceilings in the form of rime.

The position of windows is a very important matter, since they are employed not only to provide an abundance of light but also to provide fresh air. An excessive amount of glass tends to make the house too warm in the day time and too cold at night; for this reason it has been found most satisfactory to use cotton cloth in place of some of the glass, using about one-third of the window in cotton and two-thirds in glass. During the warmer seasons of the year the windows should be left open as much as possible.

Convenience.—The second essential feature in housing is that of convenience. The house should be of such size and shape that any work required can be done with ease. It should be an easy matter to clean the house and keep it sanitary. The fixtures in the house should provide for every convenience: windows and cotton curtains should be easily adjustable, hoppers should be of sufficient size to hold a quantity of grain and nests should be easily accessible and removable.

Economy.—The third essential feature in housing is that of economy. A new poultry house need not be expensive but it should be durable; the more durable the house the less the per annum cost of construction per bird.

Location.—The location of the poultry house has much influence on its success. Not only must the house be located so that it will be convenient for the attendant, but it must be located to give best results.

It is desirable to have the house located in the shelter of large buildings or trees, which serve to protect the house against winds. The soil on which the house is located should be naturally dry and well drained. In regard to the position of the house, it is best to have it face south, or, in some sections, slightly south-east.

Materials.—Of the various materials used in the construction of poultry houses, wood is of chief importance. The wood should be well-seasoned since green lumber is apt to warp, leaving cracks and gaps in the house, and these give rise to draughts. Hemlock or yellow pine is frequently used in the construction of poultry houses.

Cotton cloth is used extensively, in the fronts of houses particularly, to provide air.

Concrete, since it is durable and sanitary, should be used for the construction of the foundation and floor.

For roofing material, shingles or specially prepared roofing paper is used.

Size.—The size of a poultry house is determined by the number of birds to be housed. Small flocks require more floor space per bird than large flocks, but it is not good commercial practice to keep too many birds in one flock, 100 being about the maximum. A safe working rule is to allow about four to six square feet floor space per bird. It is a good plan, however, to give the birds as much room as possible, keeping in mind the cost of construction per bird.

Shape.—The nearer square a house is—other things being equal—the less lumber required. A long, narrow house is colder than a short deep one, because it has a larger area of exposed surface and is more inclined to be draughty. The depth of a poultry house should be in proportion to its size and height. The house should be of such depth to allow the sunlight to reach nearly all parts of the building, and, at the same time the house should be deep enough to give ample protection to the fowls. Portable houses must be of such depth as to allow being moved, but the minimum depth for a permanent structure should be about fifteen feet. The length of a poultry house should be in keeping with the depth. If it is desired to build a long house to accommodate a large flock, then the partitions should be placed in the house every fifteen or twenty feet, else the house will be draughty.

Roof.—The shape of the roof influences the cost of construction. The steeper the pitch the greater the cost of building, particularly with a shed roof house as compared with a gable, or combination roof house. On the other hand, the steeper the pitch the longer it will last. Most roofs are made one-fourth pitch, but shingle roofs should be one-third pitch. A gable roof will allow a false ceiling to be put in the house, which is an advantage, since straw can be packed in the gable and the house will always keep dry.

FOUNDATION.—Permanent poultry houses should be built upon good foundations. Concrete is usually preferable to brick or stone; a good foundation is made by mixing together one part cement, three parts sand and five parts gravel. The foundation should be built deep enough to prevent heaving by frost and to keep out water. The foundation trench should be dug about one foot wide and from two to three feet deep, depending upon climatic conditions and the nature of the soil. The bottom of the trench should be filled with coarse stones, on top of which is placed the concrete, the foundation walls being carried about six inches above the level of the ground. The ends of bolts are embedded in the walls in order to anchor the sills of the house.

FLOOR.—The floor of a poultry house should be dry, smooth and economical. Since a durable and sanitary floor is necessary, a concrete mixture of one part cement, two and one-half parts sand and five parts gravel is the best material to use. Concrete floors should be made deep enough to prevent water from rising to the surface from below. The bottom of the floor should be about one foot below the level of the ground. Place coarse stones down first, then finer ones on top, to make a good bedding for the concrete mixture. The rubble, placed on top of the coarse stones, should be pounded down well to make smooth a hard surface. The coarse stones and rubble should be about one foot in depth, then between one and two inches of concrete is put down.

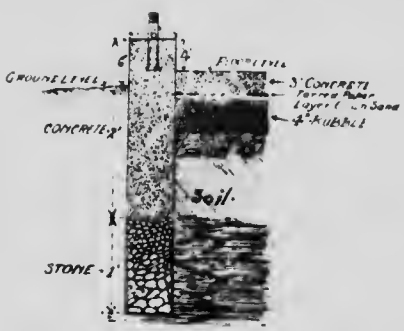


Fig. 53.—Showing construction of the foundation wall and floor of poultry houses.

FRAME.—The frame for a poultry house should be strong enough to make the house rigid. For small houses two-by-four inch scantlings may be used for the sills and studding, but for large houses the sills should be made of two-by-six inch lumber laid double, and the studdings should be made of two-by-four inch scantlings, using them double for corner posts. Plates are usually made of two-by-four inch scantlings doubled. Rafters in small houses are usually made of two-by-four inch scantlings, and in large houses of two-by-six inch lumber. Purlines may be made of two-by-four inch scantlings or two-by-six inch lumber, depending upon the width of the house.

WALLS.—The walls should be built tight enough to prevent any draught from sweeping through the house. Tongued-and-grooved boards, never over eight inches wide, are best and they should be nailed firmly to the framing material. Plain boarding may be used, providing the cracks are covered with battens. Ship-lap material or single boarding

with shingles on top are satisfactory, the latter making a warm house. Where tongued-and-grooved material is used, a double layer of boarding should be placed on the ends and the back of the house, while the front may be single boarded.

Doors.—All doors in poultry houses should be easy to open and close, and they should allow the attendant to pass through readily. The doors should be placed so that they provide for convenience in doing all work.

Roosts.—The roosts should be placed at the back of the house, away from the openings in front and should be low down, particularly

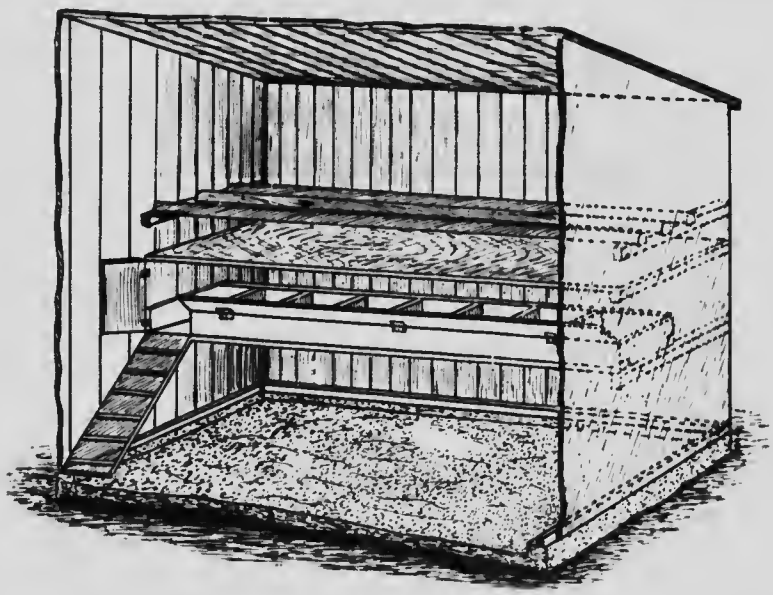


Fig. 54.—Showing construction of dropping board and nests, which are so arranged to be convenient for collecting the eggs and are also raised off the floor, giving all the floor space for scratching purposes.

for the heavier breeds. They should be made of two-by-four inch scantlings, with the corners rounded. A Leghorn requires about eight inches roost room, and a Plymouth Rock about ten inches.

Dropping Boards.—When dropping boards are used, they should be made low down to admit of easy cleaning. For one roost the dropping board should be twenty inches wide, and for two roosts the boards should be three feet wide. They should be made of matched lumber and should be well constructed, especially where nests are located under the dropping boards.

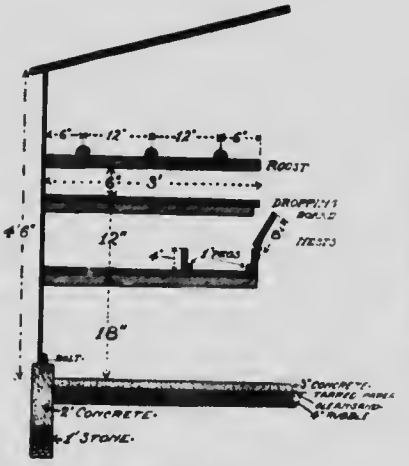
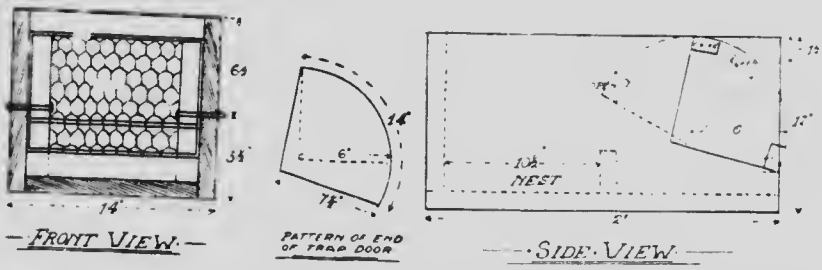


Fig. 55.—End elevation of dropping boards and nests.

Fig. 56.—The Morgan trap-nest, door closed.



Figs. 57 and 58.—Trap-nest construction. A double compartment trap-nest. The door is made in the shape of a cylinder and should be covered with finer wire mesh than is shown here. It is carefully balanced so that when the hen enters the second compartment of the nest her back touches the door and throws it off its balance and thus closes it. The hen must then remain in the nest until released.

NESTS.—Nests should always be moveable, since lice and mites frequently infest them, making fixed nests very difficult to clean and disinfect. Nests, without bottoms, placed on boarding material, are convenient and satisfactory. They should be made twelve inches wide by fifteen inches long by six inches deep, and there should be one nest for about every six hens in the flock. The nests should be so constructed that they are dark, as this tends to prevent egg eating.

Trap-nests are used in pedigree breeding work. They should be of simple design and easy to manage. The accuracy of trap-nest records is a very important matter, so that all trap-nests should be constructed and handled very carefully.

FEED BINS.—Wherever possible feed bins should be placed in or near the poultry house to facilitate the feeding problem. The bins should be made large enough to hold a quantity of grain, and they should also be convenient.

FEED HOPPERS.—Where feeding hoppers are used for feeding dry mash, they should be large enough to hold a quantity of mash, and at the same time they should be so constructed as to avoid waste.

FEED TROUGHS.—Feed troughs are used in feeding wet mash; those most commonly used being V-shaped and large enough to hold a small quantity of wet mash.

DRINKING VESSELS.—Poultry are usually provided water in open pans or in fountains. For large flocks some form of pan is practically neeessary, but for growing chicks and small flocks of adult birds, fountains may be used. Poultry must be kept supplied with a liberal supply of clean water and the dishes must be easy to clean. Covered vessels are preferable; at any rate the fowls should not be allowed to scratch litter or dirt into the water.

DUSTING BOXES.—Dusting boxes are popular with hens, and frequent dusting tends to keep lice in check. The boxes should be large enough to hold a liberal quantity of dusting material, and they should be deep enough to prevent the hens from throwing the dust out of the boxes, or from scratching litter into the boxes.

BROODY COOPS.—Broody hens require to be broken from the habit and for this purpose brooding coops are used. The best broody coops are those made of slats, which allow air to circulate freely through the coops. While the hens are confined in the coops they should be fed and watered regularly, in order that they begin laying as soon as possible.

BREEDING BOARDS.—In large houses where a high percentage of fertile eggs are required from a large flock, it is sometimes advisable to use breeding boards. They are simply boards about six feet long and eighteen inches wide, placed on uprights, so that the bottoms of the boards are about six inches off the floor. By placing two or three of these boards in a large house, in such a way that they do not interfere

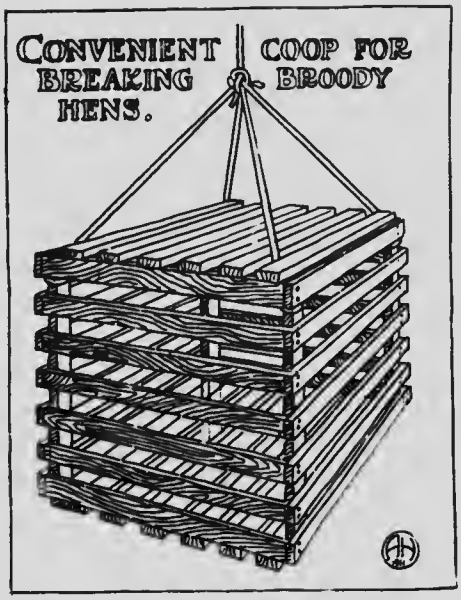


Fig. 59.—A coop for breaking broody hens.

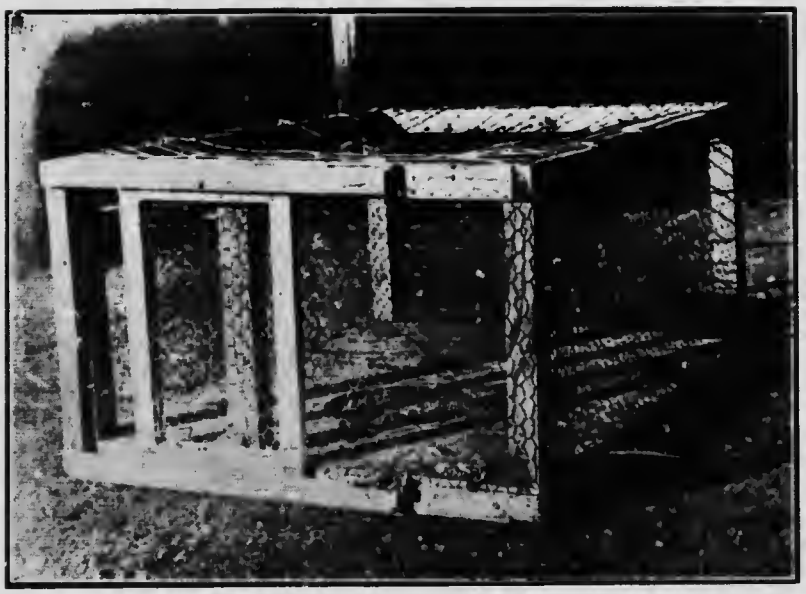


Fig. 60. A catching crate, the end door of which is placed against the opening in the poultry house. There is a slide door on the top of the crate.

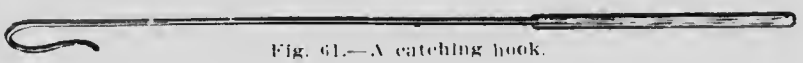


Fig. 61.—A catching hook.

with the lighting of the house, the males are prevented from disturbing one another unnecessarily.

THE PORTABLE HOUSE.—The portable house is especially adapted for a small flock and is very suitable for those who keep a few chickens on a town lot. The house in use at Macdonald College is eight by twelve feet and accommodates from fifteen to twenty hens. It is movable, and when used on the farm may be drawn near the barn for winter use and into the orchard or field for summer. The gable of this house is filled with straw, which tends to keep it thoroughly dry at all times. The lumber necessary for this house is given below:

324 feet 1 in. × 4 in. × 12 feet, planed, tongued and grooved.
2 pieces 4 in. × 4 in. × 13 feet.
96 feet 1 in. × 6 in. × 12 feet.
4 pieces 2 in. × 4 in. × 12 feet.
17 pieces 2 in. × 4 in. × 6 feet 3 inches.
16 pieces 2 in. × 4 in. × 8 feet.
36 feet 1 in. 2 in. × 4 in.
12 pieces 2 in. × 4 in. × 6 feet.
15 pieces 1 in. × 5 in. × 12 feet.
18 feet 1 in. 1 in. × 2 in. window slide.
108 feet flooring 12 feet long.
150 feet spruce 5 × 10 in. wide, 13 feet 4 in.
1 piece 2 in. × 4 in. × 12 feet.
2 pieces 4 in. × 6 in. × 13 feet (runners).

THE 100-UNIT HOUSE.—Permanent houses are built for flocks of varying sizes. The 100-hen house, measuring twenty feet by twenty feet is considered the standard. Such a house makes an ideal one for farmers and if 200 or 300 laying fowls are kept, two or three of the standard houses could be used.

The plans and specifications of two standard sized houses are given in this book. Both of these houses have given satisfaction at Macdonald College and elsewhere, and are adaptable for general use throughout the country.

The materials necessary for the Macdonald house are given below:

8 pieces 4 in. × 6 in. × 10 feet, for sills.
10 pieces 2 in. × 4 in. × 10 feet, for plates.
20 pieces 2 in. × 4 in. × 10 feet, for studding.
6 pieces 2 in. × 4 in. × 12 feet, for studding.
11 pieces 2 in. × 4 in. × 10 feet, for rafters.
11 pieces 2 in. × 4 in. × 12 feet, for rafters.
10 pieces 2 in. × 4 in. × 12 feet, for roosts.
720 feet for boarding the two ends and the back.
1,500 feet tongued and grooved, for roofing for the front and for double boarding the two ends and the back.
5 rolls roofing paper.
14 barrels cement—where foundation and floor are made of concrete. Foundation, 1:3:5; floor, 1: $2\frac{1}{2}$:5.

Fig. 62.—A colony house.

Fig. 63. Colony houses located in an alfalfa field.

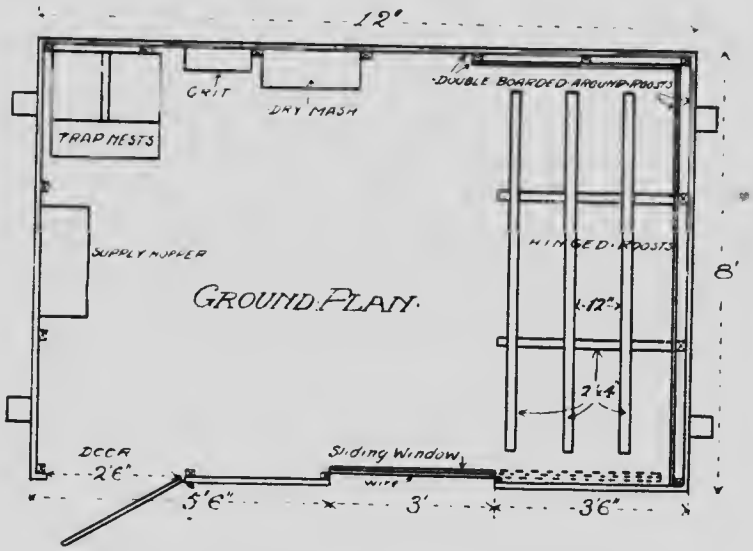


Fig. 64.—Ground plan of colony house.

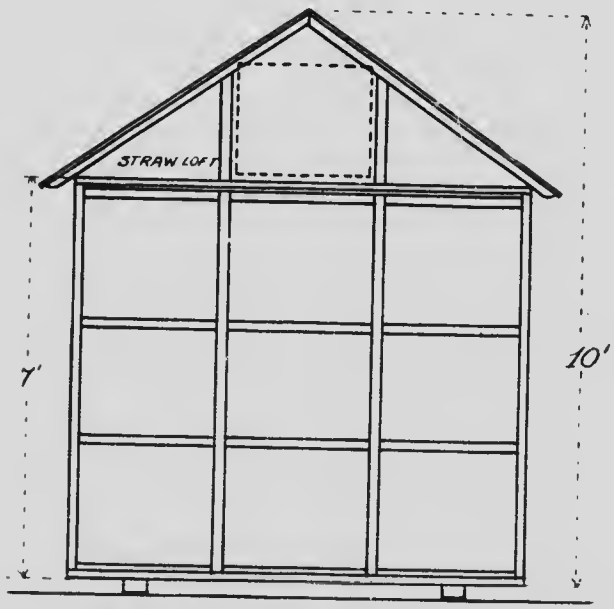


Fig. 65.—End elevation of colony house.

Fig. 66.—The Macdonald house.

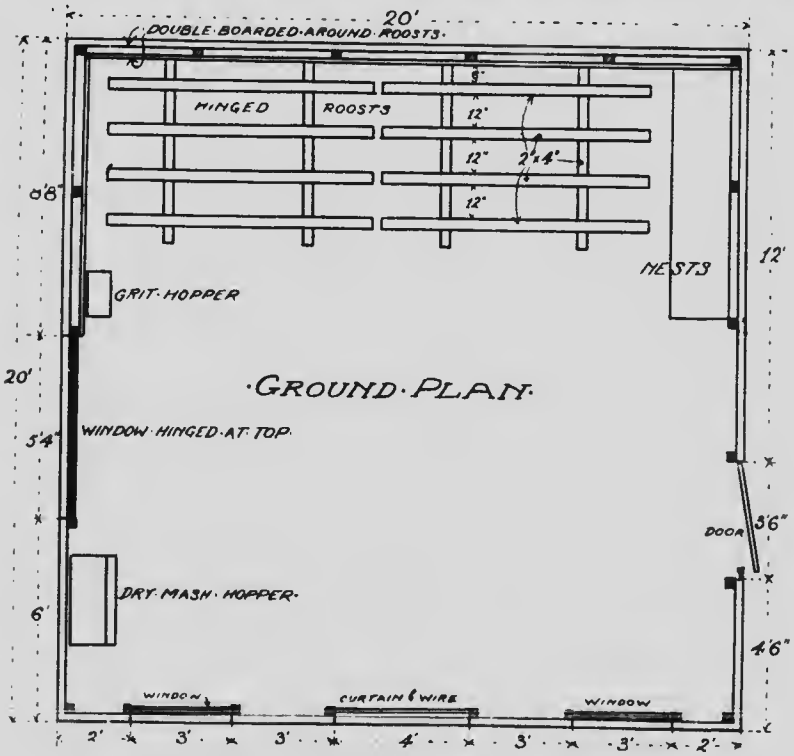


Fig. 67.—Ground plan of Macdonald house.

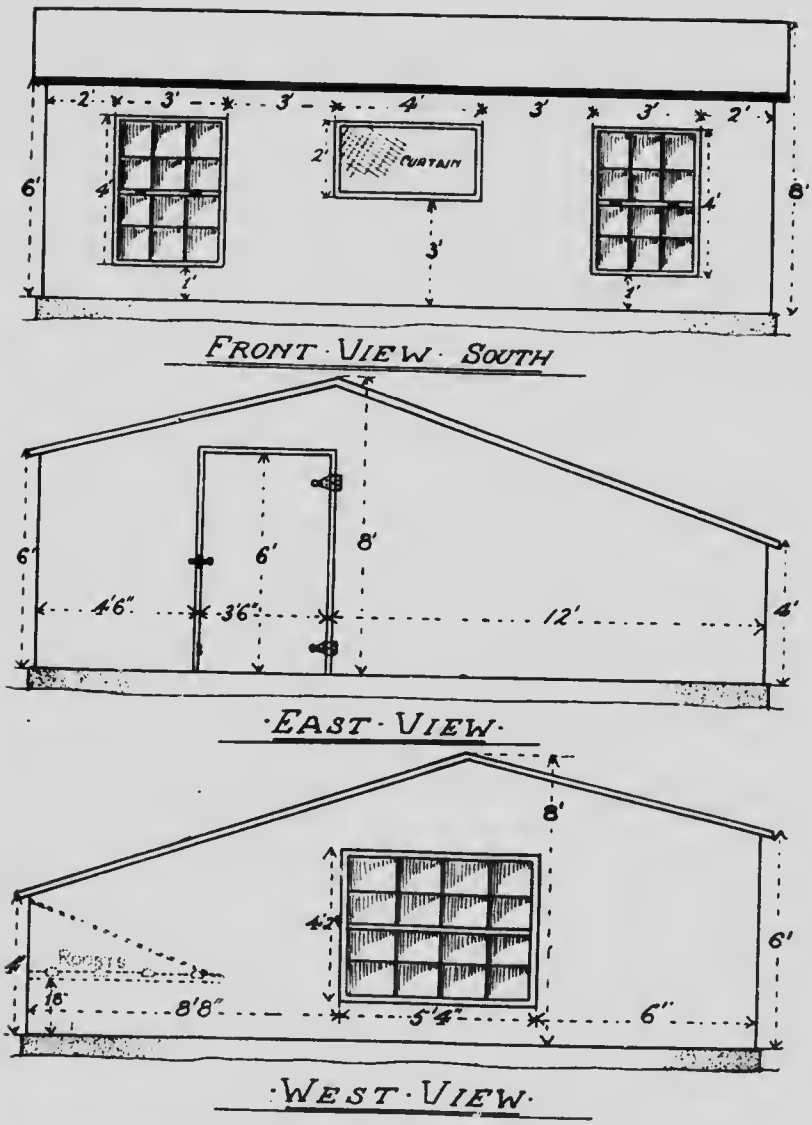


Fig. 68. Elevations of Macdonald house.

Fig. 69.—The Tolman house.

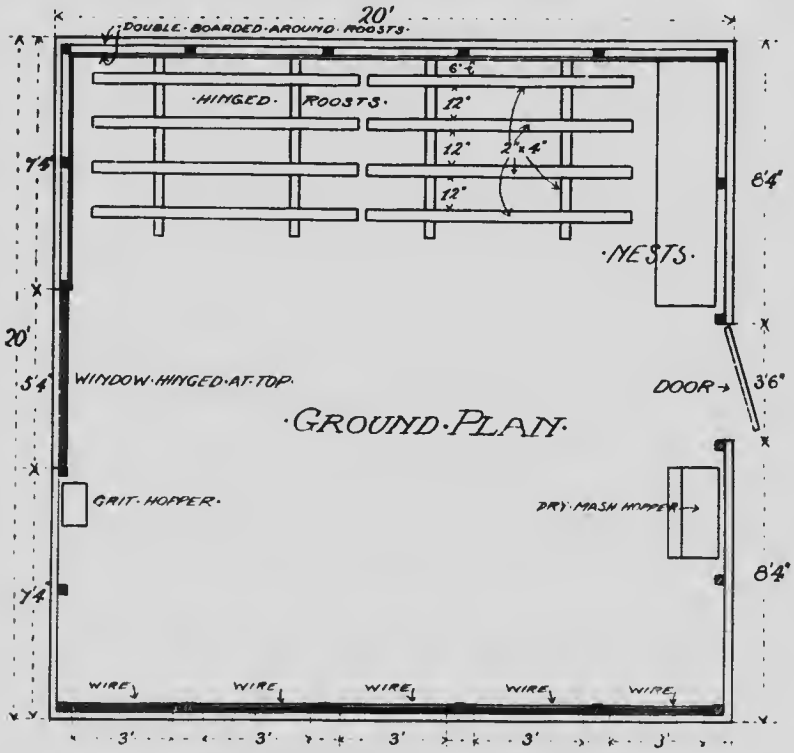


Fig. 70.—Ground plan of Tolman house.

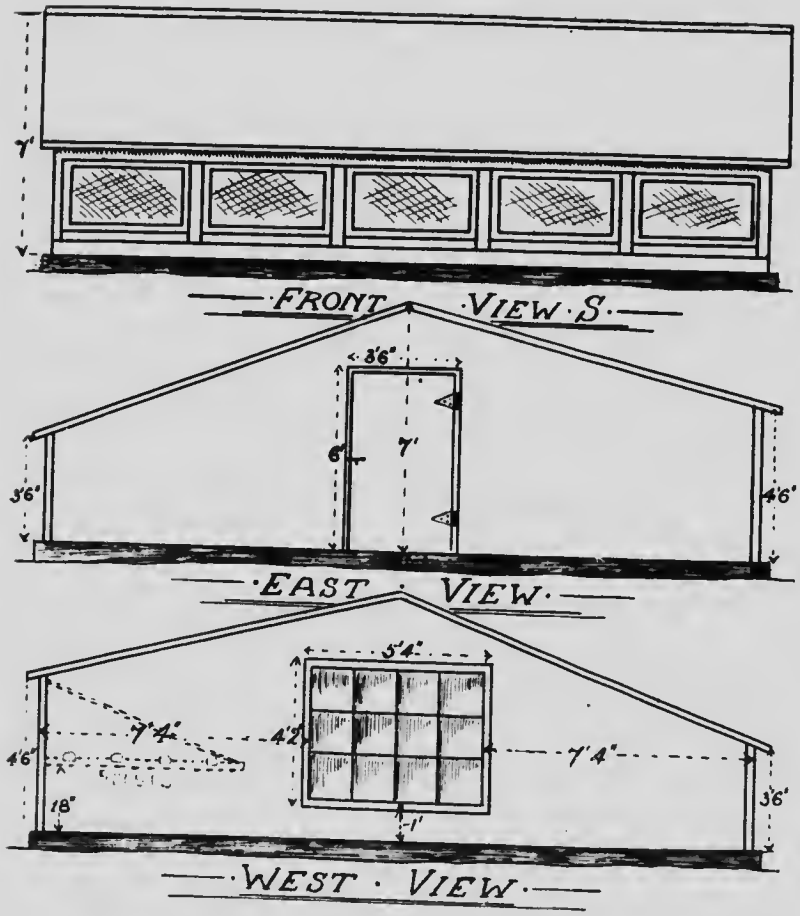
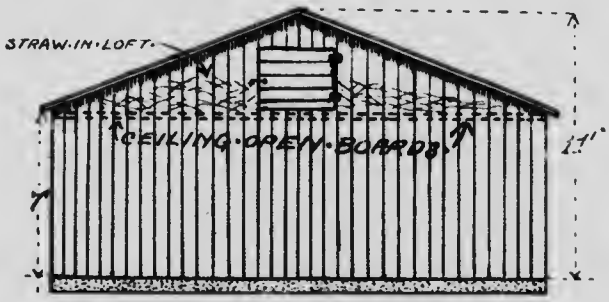


Fig. 71.—Elevations of Tolman house.

Fig. 72.—The continuous house.



— ·END·ELEVATION· —

Fig. 73.—End elevation of continuous house.

The materials necessary for the Tolman house are given below:

6 pieces 2 in. × 4 in. 14 feet, for sills.
12 pieces 2 in. × 4 in. × 14 feet, for studding, girts, etc.
24 pieces 2 in. × 6 in. × 12 feet, for rafters and ridge tree.
10 pieces 2 in. × 4 in. × 12 feet, for roosts.
600 feet for sheathing, nests, etc.
250 feet for boarding ends and sides.
250 feet tongued and grooved, as a second boarding for ends and back.
7 pieces 1 in. × 4 in. × 14 feet, pine dressed, one side cornice.
8 pieces 1 in. × 8 in. × 14 feet pine dressed.
5 rolls roofing paper.
14 barrels cement—where foundation and floor are made of concrete. Foundation, 1:3:5; floor, 1:2½:5.

THE CONTINUOUS HOUSE.—There are many poultrymen who are keeping more than 100 hens and in some cases a continuous house accommodating 275 to 300 birds can be used to good advantage. Such a house should be twenty feet wide by sixty feet long and divided into three equal sections. The interior arrangement is practically the same as for the Macdonald and Tolman houses. The upper half of each window is provided with a cotton frame for fresh air supply. The straw in the gable keeps the house thoroughly dry at all times.

The materials necessary for the continuous house are given below:

66 pieces 2 in. 4 in. 10 feet, for studding and plates.
16 pieces 2 in. × 4 in. 14 feet, for roosts.
62 pieces 2 in. × 6 in. × 12 feet, for rafters.
5,680 board feet for single boarding front, double boarding ends and back, partitions, roofing and nesting material.
15 rolls roofing paper.
40 barrels cement—where foundation and floor are made of concrete. Foundation, 1:3:5; floor, 1:2½:5.

Fig. 74.—Front elevation of continuous house. The arrangement of windows here is an improvement over that shown in Fig 72, since it gives more light and more fresh air.

MARKETING POULTRY

In the marketing of poultry the producer should take into consideration prices for live and dressed poultry. Although it is usually more profitable for the producer to market his poultry dressed there are times, particularly in the late winter and early spring, when prices for live poultry may be in excess of prices for dressed poultry.

LIVE POULTRY

In shipping fowls alive it is very important to ship them in strong crates which provide plenty of air. The shipping crate should have the sides, ends and tops slatted. The top slats should not be more than one and one-half inches apart. The crate should be between twelve and sixteen inches high, not more than thirty inches wide and not more than forty-eight inches long.

DRESSED POULTRY

When the birds are ready to be killed, they should be starved about twenty-four hours. This will clean out the crops and intestines

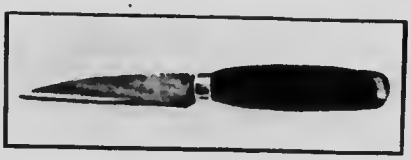


Fig. 75.—A killing knife

of all food and the birds will keep longer, and will be of better quality. When they are being starved, they should be given water to drink, which will wash food particles out of the digestive tracts. This is a very important matter—starve before killing.

KILLING.—One of the best ways to kill a fowl is to bleed it by severing the arteries in the neck. From the ceiling of the room in which the killing is to be done, the fowl is suspended by the feet at about the height of the shoulder of the plucker. Any stout cord with a short stick in the end will do to wrap round the bird's feet. The wings are crossed at the back so that the bird cannot flutter. In that position it is ready to be bled.

For this purpose a particular kind of killing knife is necessary. The blade of the knife should be of a heavy piece of steel, about two inches long, a quarter-inch wide, and one-eighth inch thick on the back. It should be ground to a sharp point with a straight cutting edge, the slope of the point being taken from the back edge rather than

Fig. 76. — Showing the method of severing the arteries, on the left, and piercing the brain on the right.

Fig. 77. — A blood-can.

Fig. 78.—Showing the blood-can attached to the beak after the bird has been bled and brained.

from the front edge. The handle should be fairly stout, so that it can be grasped readily.

It takes but a fraction of a second to suspend the bird for killing, and when all is ready the head of the fowl is taken in the left hand and the killing-knife in the right hand. With the thumb and forefinger of the left hand the mouth is forced open by pressure and the knife is inserted into the mouth with the blade pointing toward the back of the head. The knife is then forced up to the juncture of the head and neck where the arteries come down on each side of the neck; these are severed, which causes the fowl to bleed freely.

Immediately after the fowl has been bled, the knife is forced into the roof of the mouth. This is done by withdrawing the knife from the juncture of the head and neck, turning it over so that the back of the knife now passes along the upper beak into the groove in the roof of the mouth. It is immediately forced into the brain cavity, so that the brain is pierced. If the brain has been pierced properly the bird will squawk and it will also make a convulsive movement which tends to loosen the feathers in the feather muscles. Proper piercing of the brain makes plucking much easier, whereas if the brain has not been properly pierced the feathers are hard to pluck and the skin frequently is torn badly.

Just as soon as the bird has been bled and the brain pierced, a blood can, which is weighted in the bottom, is hooked on to the lower mandible to catch the blood. It also prevents the bird from moving its body too much.

PLUCKING.—The sooner the bird is plucked the better. Experts can pluck a fowl in less than one minute. The birds are always plucked dry; it gives them a much nicer appearance and they will keep longer.

In dry plucking, rapidity of movement is necessary. Different pluckers have different ways of plucking, but we have found the following order to be convenient and rapid: neck, wings, tail, breast, legs, back and body.

As soon as the blood-can has been hooked on the beak, a squeezing motion with the fingers round the neck from the base toward the head removes the feathers of the neck.

The soft feathers covering the breast are removed readily by a sort of rubbing motion, rubbing the opposite way the feathers normally lie. Then the wings are held firmly in the left hand and the main wing feathers are removed with one jerk by the right hand and the main tail feathers are given a slight twist which should remove them with ease. The thighs and legs are easily plucked in much the same manner as the neck; then finally the back and body of the bird are plucked. After plucking has been completed, pin feathers may be removed by using a dull, round-bladed knife. Care should be exercised not to tear the skin. Even small blemishes lower the market value of the dressed bird.

CLEANING.—After the bird has been dressed the head and feet should be washed with a stiff brush. The vent should be squeezed.

and if any food remains in the crop an opening should be made just above the shoulder and the food taken out.

WRAPPING.—The head should be wrapped in parchment paper. Then the bird should be placed where it will cool properly, because it is necessary that the heat pass out of the body as soon as possible after

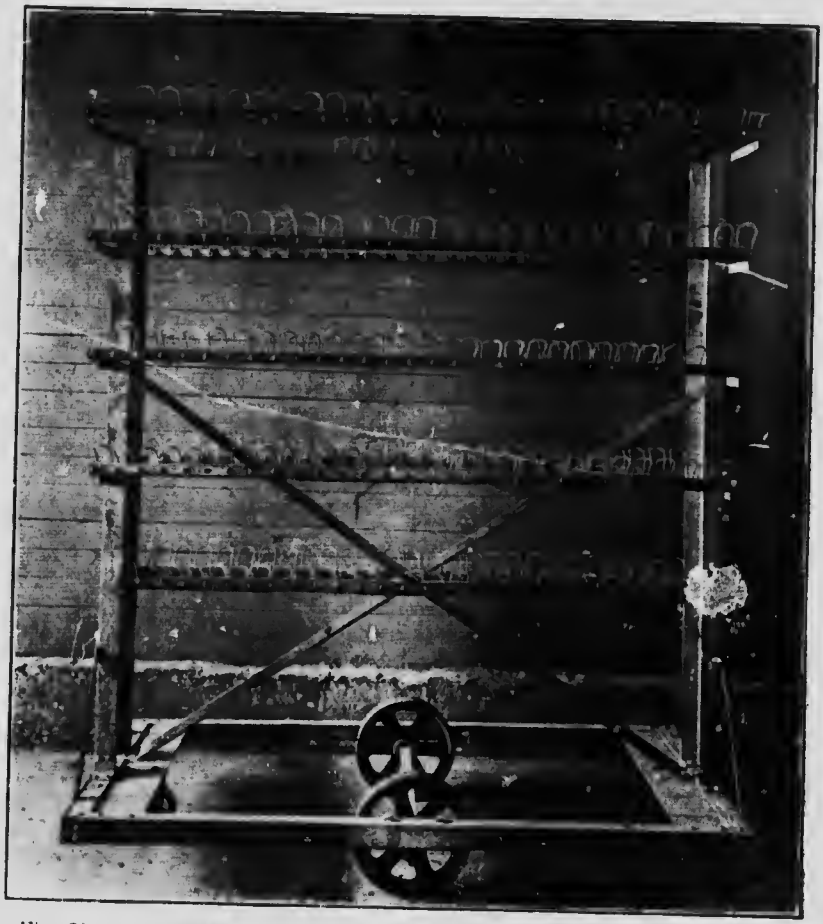


Fig. 79.—A cooling rack for the cooling of dressed poultry before packing.

the fowl has been killed. Proper cooling prevents bacteria from developing and tends to keep the fowls much longer.

PACKING.—Boxes of various sizes are used for shipping the different classes of dressed fowls. Usually each box is made to hold twelve fowls. A box of roasters is made nineteen inches long, sixteen inches wide and eight inches high, all inside measurements. For small roasters

the box measures on the inside seventeen and one-half inches long, fifteen inches wide and seven inches high. Large fowls require a box measuring on the inside eighteen inches long, seventeen inches wide and nine inches high. A box for medium fowls measures, on the inside, sixteen inches long, fifteen inches wide and seven and one-half inches high.

GRADING.—In shipping poultry to market, it is well to grade the birds according to weight and quality. The following standard classification, adopted by the Canadian Produce Association, is given as a guide to those having live or dressed poultry to market.

LIVE POULTRY CLASSES

The classes for live poultry shall be: Chickens, Fowl and Cocks.

Sub-classes for Chickens.

Broilers	Birds weighing	under	2½ lbs.
Roasters, medium	"	under	4½ lbs.
heavy	"	over	4½ lbs.
Capons, light	"	under	6 lbs.
heavy	"	over	6 lbs.

Sub-classes for Fowl.

Light	Birds weighing	under	3½ lbs
Heavy	"	from	3½ to 5 lbs.
Medium	"	over	5 lbs.

Sub-classes for Cocks.

Light	Birds weighing	under	4½ lbs.
Heavy	"		4½ lbs. and over.

LIVE POULTRY GRADES

Grades and Sub-grades.

Milk-fed Poultry	No. 1 quality.
	No. 2 quality.
Range-fed Poultry	No. 1 quality.
	No. 2 quality.

DEFINITIONS OF GRADES AND SUB-GRADES.

Milk-fed—

Birds which have been systematically finished for market in crates and with which milk has been a portion of the ration, must be healthy specimens with well-muscled breasts, and show deposits of fat on the pin bones and back, also the flesh must be soft.

Range-fed—

Birds which have been allowed the full run of the farm and have received no special attention as to finishing.

No. 1 Quality—

Birds must be healthy and thrifty specimens, well-muscled breasts, straight breast bones, and well finished in flesh.

No. 2 Quality—

All other birds fit for food.

DRESSED POULTRY CLASSES

The classes for dressed poultry shall be: Chickens, Fowl and Cocks.

In the weight classes of dressed poultry, specimens in the container must not vary more than half-a-pound in weight in the case of Chickens and Fowl, and one pound in the case of Cocks. The container must be clearly marked, stating the number of birds placed therein and the net weight.

DRESSED POULTRY GRADES

There shall be five grades for all classes of dressed poultry:—Specials, No. 1, No. 2, No. 3, and Culls.

All poultry to Grade Specials, No. 1, No. 2, and No. 3, must be well bled through the mouth, undrawn, dry picked, clean of feathers, dry cooled, head and feet left on.

Birds that are killed by other methods, scalded, drawn, or wet cooled, cannot be so graded unless the outside of the package is very plainly and conspicuously marked, indicating the method of killing, dressing, cooling or the fact that they are drawn.

Definitions of Grades

Specials—

Birds in this class are particularly perfect specimens, both as to conformation, quality and flesh. No pin feathers, bruises, breaks or tears in the skin or flesh or evidence of food in the crop, are allowable. They are choicest specimens.

Chickens and Fowl—

Where more than one bird is placed in a package, they must not vary more than one quarter of a pound in weight; the color of the corresponding sections must be uniform, such as skin color, and legs, etc.

Cocks—

When more than one bird is placed in a package, they must not vary more than one pound in weight; the corresponding sections must be uniform.

No. 1—

Birds in this class must show no pin feathers, must be well fatted and fleshed. No deformities in conformation of any kind are allowable. Abrasions in the skin are not to exceed more than half an inch in length, and there shall be no more than two abrasions on each specimen.

Chickens and Fowls—

Where there is more than one bird placed in a package, the color of the corresponding sections must be uniform and birds must not vary more than one quarter of a pound each in weight.

Cocks—

When more than one bird is placed in a package, they must not vary more than one pound each in weight; the color of the corresponding sections must be uniform.

No. 2—

Birds must be well fleshed and fatted. No deformities are allowable, except slightly crooked breast bones. The birds must be cleanly picked and may show tears in the skin not to exceed 1½ inches in the total length and not more than five small abrasions.

Chickens and Fowl—

When more than one bird is placed in a package, they must not vary more than one quarter of a pound each in weight in those classes weighing more than 3 lbs. each; the corresponding sections must be uniform in color.

Cocks—

When more than one bird is placed in a package, they must not vary more than one pound each in weight. The color of the corresponding sections must be uniform.

No. 3—

Poorly-fleshed birds. Birds well fleshed but badly torn, bruised or poorly dressed.

Chickens and Fowl—

When more than one bird is placed in a package, they must not vary more than one half-pound each in weight.

Cocks—

When more than one bird is placed in a package, they must not vary more than one pound each in weight.

Culls—

All other birds fit for food.

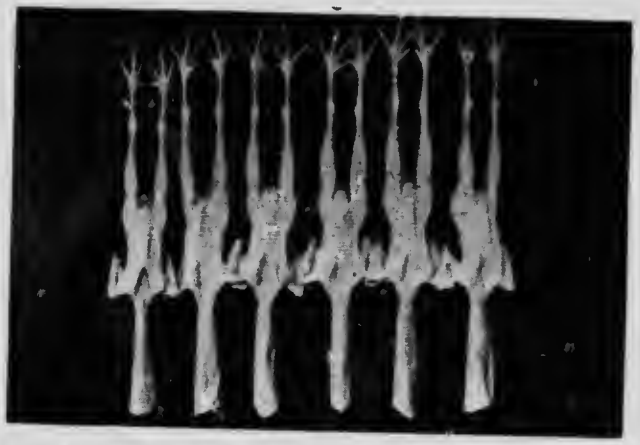


Fig. 80.—Broilers grading as Specials. Note the excellent finished condition and the neat appearance, which is improved by the wrapped heads.

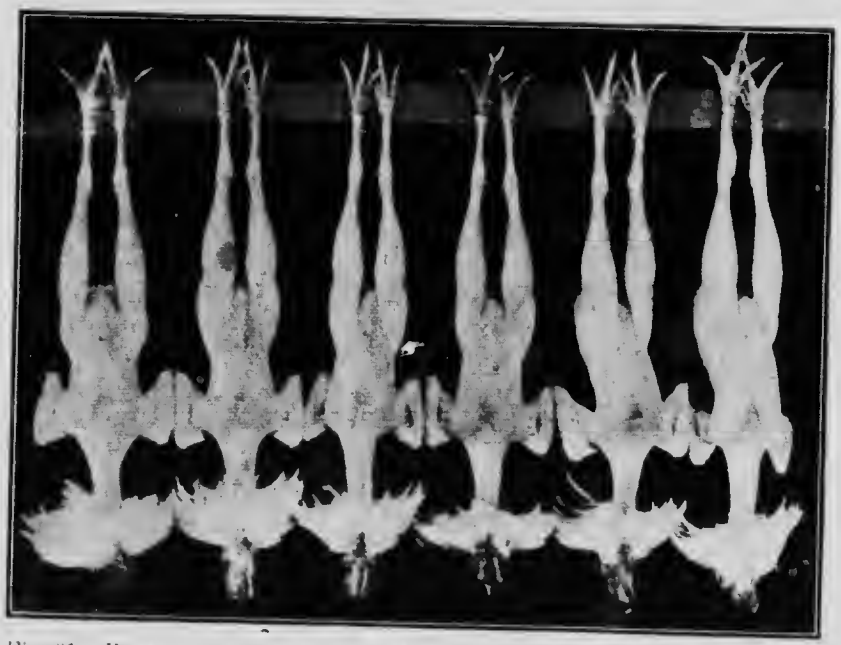


Fig. 81.—Roasters grading as Specials. It would be difficult to improve upon the finished condition of the birds shown here.

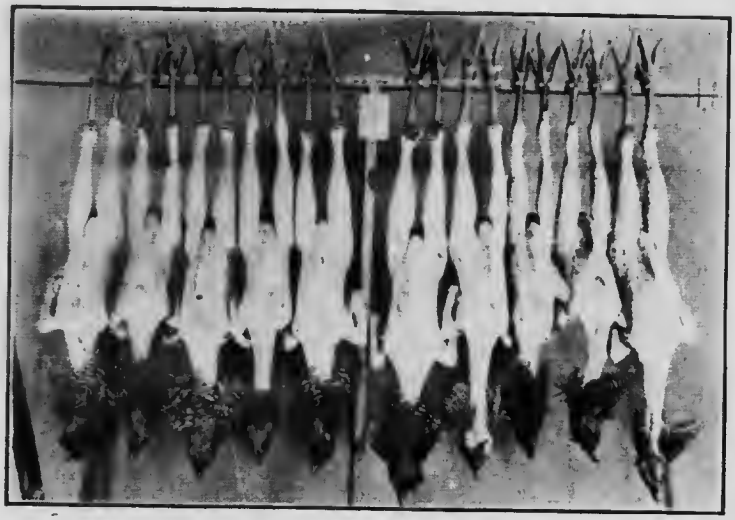


Fig. 82.—Barred Plymouth Rocks make fine roasters.

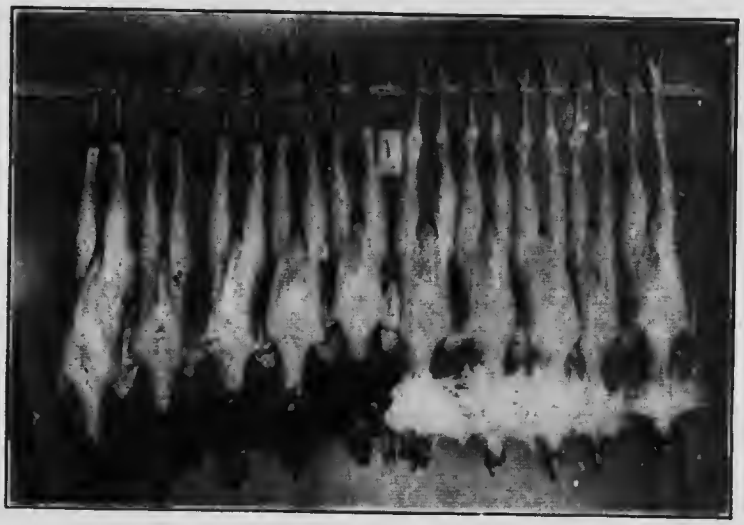


Fig. 83.—Rhode Island Reds and Wyandottes also make good roasters.

Fig. 84.—Showing the bad effects of scalding poultry.

Fig. 85.—A dressed bird with a very crooked keel and a crop full of food, both of which are very objectionable.

Fig. 86.—This dressed poultry was bought on the market, and it shows the very poor quality of birds often marketed.

STANDARD DRESSED POULTRY PACKING WEIGHTS

Sub-classes for Chickens.				
Broilers	Birds	weighing	from	¾ to 2½ lbs.
Fryers (light Roasters)	"	"	"	2½ to 3½ lbs.
Roasters, medium	"	"	"	3½ to 4½ lbs.
heavy	"	"	"	4½ lbs. and over.
Capons, light	"	"	"	6½ lbs. and under.
heavy	"	"	"	6½ lbs. and over.
Sub-classes for Fowl.				
Small	Birds	weighing	under 3	lbs.
Light	"	"	from 3	to 3½ lbs.
Medium	"	"	"	3½ to 4½ lbs.
Heavy	"	"	"	4½ lbs. and over
Sub-classes for Cocks.				
Light	Birds	weighing	under 4	lbs.
Heavy	"	"	4 lbs.	and over.

Fig. 87.—A case of poultry packed attractively.

MARKETING EGGS

Eggs represent the only article of animal food produced in a natural package, the shell; as long as the shell is unbroken the egg cannot be adulterated. With the increase in the percentage of the urban population, there has been a relatively greater consumption of eggs than of meat. Of all foods, eggs are among the most palatable, easily digested and readily assimilated, and there is no food which can be substituted for such a unique commodity. Moreover, recent investigational work has shown that eggs are second only to milk as a necessary article of diet.

Fresh eggs differ in size, shape, color and quality. They are perishable products and, consequently they should be transported from the

Fig. 88.—A basket of uniform eggs, grading as Fresh Gathered Specials.

producer to the consumer as quickly as possible. Furthermore, the means of transportation should be such as to ensure the eggs reaching the consumer in as good condition as possible.

Causes of Waste.—The conditions under which eggs are produced should be greatly improved; such improvement will result in a higher average annual price to producers, a higher-grade product for the consumers and the elimination, to a great extent, of the present enormous annual wastage of the egg crop. Very often the fowls are fed on unwholesome food, which affects the odor and flavor of the eggs. Dirty poultry houses and dirty nests are the cause of dirty eggs. Meat-spots, blood-spots and bloody eggs cannot be avoided, but they should not be sold with the rest of the eggs. Blood-rings and rotten eggs are caused by having the males with the females during warm weather, or when

broody hens sit upon the eggs. Musty and mouldy eggs result from the storing of eggs in bad places. Hair-splits, cheeks and leakers are caused by rough handling either at home or after the eggs have been sold.

Improve Conditions.—It will be noted that most of the conditions which give rise to bad eggs can be improved. If the proper improvements are made it will mean that more good eggs will be sold and much money will be saved, for every egg that is spoiled means a loss of money. There is an enormous amount of money lost every year because so many good eggs are spoiled. Much of this money can be saved if the quality of market eggs is improved.

A simple set of practical rules has been suggested, and, if these rules were followed, much trouble with which the trade has had to contend would be avoided. Producers are strongly advised to keep the hens in

Fig. 89.—A basket of eggs lacking in uniformity; some of them would grade Fresh Gathered Specials, while others would grade No. 1, Cracked and Dirty.

comfortable, sanitary houses and give them clean nests at all times. Eggs should be gathered regularly twice daily in warm weather and once daily at other times of the year. The eggs should be stored in a cool, dry room at a temperature not higher than 60° F., and every precaution should be taken to keep the eggs out of the sunlight as much as possible. All mature male birds should be killed or sold as soon as the breeding season is over, and they should be kept out of the laying flock, except during the breeding season.

GRADING EGGS

The highest price can only be obtained for any product when it is uniform in quality. Large and small eggs should be sold separately. Eggs sold in one lot should either be all white or all brown, and they

Fig. 90.—Showing the natural size of the air space in a fresh egg, with the depth marked.

Fig. 91.—Showing an enlarged air-space in a stale egg.

Fig. 92.—An X-ray photograph showing the size of the air-space in a fresh egg.

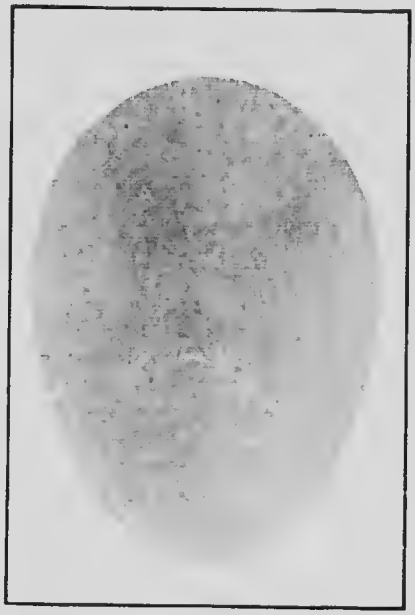
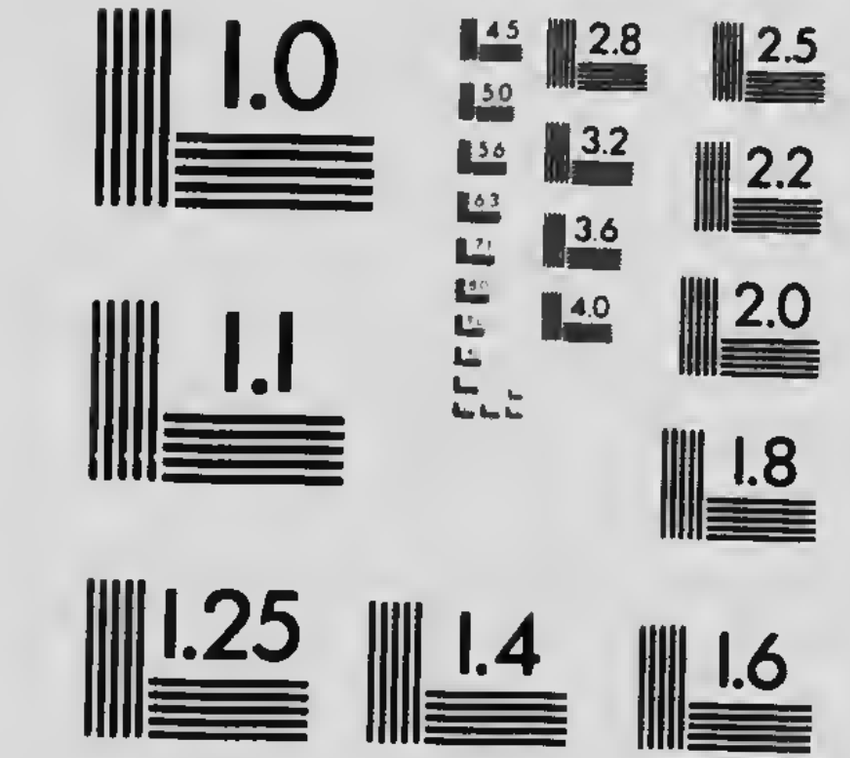


Fig. 93.—An X-ray photograph showing the size of the enlarged air-space in a stale egg.

Fig. 94.—An attractive carton is a good advertising medium for high quality eggs.

Fig. 95.—Showing method of packing thirty one-dozen cartons in an egg case for high-class trade.



should be about of the same age. Fresh eggs should be sold separately, because if dirty, stale or rotten eggs are mixed with them, the price is lowered. It pays to grade eggs.

The Canadian Produce Association has adopted regulations made under the provisions of the "Live Stock and Produce Act" respecting the grading and marking of eggs. Anyone having eggs to market should make a careful study of this classification.

Eggs for domestic consumption or for export but not including eggs intended for incubation, shall be classified and graded as follows:

CLASS 1—FRESH GATHERED—Eggs which have not been held under artificial refrigeration or subjected to artificial preservation.

Fig. 96.—The thirty-dozen commercial egg case, showing method of packing to prevent breakage. The excelsior should be spread evenly over the top and bottom of the case.

Grade (a) *Specials*—Eggs of uniform size, weighing over 25 ozs. to the dozen or over 47 lbs. net to the 30-dozen case; absolutely clean, strong and sound shell; air cell small, not over 3-16 of an inch in depth; white of egg to be firm and clear and yolk dimly visible; free from blood clots.

Sub-grade (1) *Pullet Specials*—Eggs which have the quality of specials but which fall short in weight shall be known as pullet specials, providing they weigh at least 23 ozs. to the dozen or 43 lbs. net to the 30-dozen case.

Grade (b) *Extras*—Eggs of good size, weighing at least 24 ozs. to the dozen or 45 lbs. net to the 30-dozen case; clean; sound in shell; air cell less than ⅜-inch in depth; white of egg to be firm and yolk slightly visible.

Sub-grade (1) *Pullet Extras*—Eggs which have the quality of extras but which fall short in weight, shall be known as pullet extras, providing they weigh at least 20 ozs. to the dozen or 37½ lbs. net to the 30-dozen case.

Grade (c) *No. 1's*—Eggs weighing at least 23 ozs. to the dozen or 43 lbs. net to the 30-dozen case; clean; sound in shell; air cell less than ½-inch in depth; white of egg to be reasonably firm; yolk may be quite visible but mobile, not stuck to the shell or seriously out of place; air cell not necessarily stationary.

Grade (d) *No. 2's*—Eggs clean; sound in shell; may contain weak watery eggs and eggs with heavy yolks, and all other eggs sound in shell and fit for food.

CLASS 2—STORAGE OR PRESERVED—Eggs which have been held under artificial refrigeration at a temperature of 40° or less, or subjected to any process, liquid or otherwise, intended to preserve their quality.

Grade (a) *Extras*—Eggs of good size, weighing at least 24 ozs. to the dozen or 45 lbs. net to the 30-dozen case; clean; sound in shell; air cell less than ⅜-inch in depth; white of egg to be firm and yolk slightly visible.

Grade (b) *No. 1's*—Eggs weighing at least 23 ozs. to the dozen or 43 lbs. net to the 30-dozen case; clean; sound in shell; air cell less than ½-inch in depth; white of egg to be reasonably firm; yolk may be quite visible but mobile, not stuck to the shell or seriously out of place; air cell not necessarily stationary.

Grade (c) *No. 2's*—Eggs clean; sound in shell; may contain weak, watery eggs and eggs with heavy yolks, and all other eggs sound in shell and fit for food.

CLASS 3—CRACKED AND DIRTY—Egg shells of which have been checked or broken. Eggs smeared or damaged in shell but fit for food.

Grade (a) *No. 1's*—Eggs weighing at least 23 ozs. to the dozen or 43 lbs. net to the 30-dozen case; air cell less than ½-inch in depth; white of egg to be reasonably firm; yolk may be quite visible but mobile, not stuck to the shell or seriously out of place; air cell not necessarily stationary.

Grade (b) *No. 2's*—May contain weak, watery eggs with heavy yolks, and all other eggs fit for food.

PRESERVING EGGS

During the fall and winter months of the year there is a scarcity of fresh eggs. The yearling stock usually passes through the moulting period in the late summer and the pullets, which have been raised during the season do not begin to lay until late in the fall or early in winter. To make up for the shortage of eggs at this time it is advisable to preserve a quantity of spring eggs. April and May eggs are produced cheaply and cost little to preserve, and even on the farm it will pay to use these preserved eggs in place of new-laid fall eggs which command a good price.

In preserving it is essential to use fresh eggs only, and it has been found that April and May eggs are best for this purpose.

Eggs may be preserved by the lime-water method or by the water-glass method, both of which have been found satisfactory.

LIME-WATER.—In the lime-water method good results have been obtained by using one pound of lime to five gallons of water. Slake the pound of lime in a small quantity of water and then stir this milk of lime into five gallons of water. After the mixture has been kept stirred for a few hours, it is allowed to settle and the liquid above the lime is called lime-water. This is drawn off and is poured over the eggs, which have been carefully placed in a crock or other water-tight vessel. The eggs must be completely immersed at all times and the top of the crock or container should be covered. Instead of a cover a layer of sweet oil may be poured on the top of the solution of lime-water. Should there be any precipitation of the lime the lime-water should be drawn off and replaced with a fresh supply.

WATER-GLASS.—In preserving eggs with water-glass, practically the same method of procedure is adopted as with lime-water. Boil nine quarts of clean water and allow it to cool, then add one quart of water-glass (sodium silicate). This solution is poured over the eggs, which are placed in crocks or glazed jars, and the top layer of eggs should be immersed for a depth of two inches at least. A layer of melted paraffin poured over the top of the solution will exclude the air.

HYGIENE AND SANITATION

The health of poultry is of paramount importance in its relation to results secured in poultry raising, and the maintaining of health is dependent upon the constitutional vigor of the stock and sanitary methods employed in management.

Constitutional Vigor.—The first rule of good poultry keeping is to have healthy and vigorous stock. Every bird in the flock should possess a sound constitution, otherwise it is impossible to breed good stock. The constitutional vigor of a bird should be the first test to which it is submitted in selecting it for the breeding pen and poultry breeders should develop the ability of selecting a good from a poor bird.

Fig. 97.—Showing the importance of constitutional vigor in breeding stock. The chicks shown in A have white diarrhoea, having been hatched from weak parents. Note by way of contrast the fullness of body and the sprightliness of the chicks shown in B, which were hatched from vigorous stock.

There are several external evidences of good vigor. A healthy appearance, combined with a bright, red comb, a full, bright eye and a glossy plumage are strong evidences of a sound, vigorous constitution. In a good breeder the head is short and broad and the neck is of fair length, not snake-like in appearance, and is well attached to the shoulders, which are broad. The back is fairly long and the body is deep and well meated. The legs are short and strong and are well placed under the body.

Hygienic Feeding.—The proper feeding of the fowls is important to keep them in the best possible condition. The food given to poultry should always be wholesome. Sour milk is a valuable health food for all classes of poultry. An abundant supply of green food is always necessary. It is wise to avoid overfeeding at all times, but more particularly when the chicks are young; overfeeding affects the digestion and lowers the vitality.

CLEAN WATER.—Clean and fresh drinking water should always be provided. The drinking v ' is the most effective means of spreading disease among the birds, t this reason it is very necessary to take every precaution in keeping the vessels clean. It is a good practice to put in the drinking water some antiseptic, such as potassium permanganate, which can be bought at any drug store. Make a stock solution by putting the potassium permanganate one inch thick in a jar and filling the jar with water. The water will dissolve most of the permanganate but more of the crystals should be added from time to time. Whenever the poultry is watered, add enough of the stock solution to give the drinking water a deep, purple color. In addition to this, the drinking vessels should be cleaned and disinfected regularly.

CLEAN LAND.—Where poultry is kept on the same soil year after year, and if the soil is not cultivated regularly, it soon becomes tainted and unsuitable for poultry keeping. For this reason it is very necessary to give the fowls new areas of land as frequently as possible and cultivate the areas on which they have been raised. The cultivation of the soil and growing green food does much to keep the soil sweet and clean. A good run may be made for a poultry yard by using a mixture of: 5 lbs. Kentucky Blue Grass, 5 lbs. Canadian Blue Grass, 7 lbs. Perennial Rye Grass, and 3 lbs. White Clover.

CLEAN HOUSES.—In the matter of housing it has been pointed out previously that the house must provide plenty of light and fresh air and that it must be dry and draught-proof. Aside from this, it must also be clean. Every poultry house and coop should be cleaned thoroughly at least once every year. To clean the poultry house, remove the litter and scrape the floor thoroughly. Then wash the floor, roosting quarters, nesting quarters and all other parts of the building, using a scrubbing brush, if necessary, to remove all of the dirt. To make sure that the house is cleaned thoroughly, give it another washing, over all parts of the interior. After the second washing, if done properly, the house is ready to be disinfected.

DISINFECTING.—To disinfect the house it is necessary to spray or apply with a scrubbing br sh a good disinfectant. The disinfectant should be applied twice, allowing time between for it to dry. Some good disinfectants include zenoleum, izal, formaldehyde and carbolic acid. Use the first two in strengths of ten per cent. solutions, that is, to nine quarts of water add one quart of zenoleum or izal. A five per cent. solution of commercial formalin makes an excellent disinfectant; use a liberal amount, and in applying formalin protect the hands with gloves. After the house is thoroughly disinfected, then apply a mixture of one part crude carbolic acid with three parts kerosene. The house should now be clean and ready for use again. Besides the annual cleaning and disinfection just described, the hous should be thoroughly disinfected

once a month during cold weather and twice a month during warm weather.

The same disinfecting material should be used on all apparatus and utensils. Every incubator should be thoroughly disinfected before and after every hatch. Every brooder and all parts of the brooding equipment should be disinfected before any chicks are put with the brooder, and disinfection should be carried on regularly throughout the season. All drinking vessels and feed troughs should be regularly disinfected. It is only by paying particular attention to details and endeavoring to keep everything scrupulously clean that best results are secured.

EXTERNAL PARASITES

Unless disinfection is done regularly, lice and mites will increase very rapidly. Poultry infested with lice or mites are not profitable, because these parasites live on the blood and tissues of the poultry. The lice stay on the poultry most of the time, while the mites visit the poultry at night and remain under the roosts or in other secluded places during the day.

A good method of ridding fowls of lice is to treat them with mercurial ointment U.S.P., made with a lard base. On each fowl rub three small pieces of ointment, each piece about the size of a pea, one beneath the vent and one under each wing. Rub the ointment on thoroughly and the fowls should be practically free of lice. An effective dusting powder is made of three parts gasoline, one part crude carbolic acid (90 to 95 per cent. tar acid), and enough plaster of paris for the preceding liquids to moisten. This is mixed thoroughly and then allowed to dry and is stored in air-tight containers. When dusting, rub the powder well into the feathers. Every fowl should be individually treated when put in the laying pen in the fall.

VICES

There are three vices, egg eating, feather pulling and toe-picking, which flocks often contract, particularly among confined flocks kept under unsanitary conditions. When once started, these vices usually spread rapidly; therefore, every effort should be made to keep the flocks under the most sanitary conditions and to provide means for the birds to take plenty of exercise.

EGG-EATING.—To prevent the egg-eating vice from developing, provide dark nests. Feed the scratch grain in the litter which should be six or eight inches deep. The mash mixture should contain meat food of some kind, such as beef or fish scraps. Feed plenty of green food and keep oyster shells or some other source of lime supply before the birds at all times. If sour milk or buttermilk is available, provide it regu-

larly. As soon as the vice appears, remove the worst offenders and improve the conditions of feeding and management.

FEATHER-PULLING.—The vice of feather-pulling can be prevented by keeping birds in sanitary conditions, providing plenty of exercise, green food, an abundant supply of meat food in the mash mixtures, and sour milk or buttermilk as drink.

TOE-PICKING.—Sometimes chicks develop the bad habit of picking one another's toes. This habit often starts when the chicks are being brooded in close quarters or when there is a deficiency of animal food in the ration. If the picking is continued until bleeding results, then cannibalism often develops, and a number of chicks may be lost. As soon as the habit begins, the chicks should be given larger quarters, placed on new ground if possible, and the chicks with bleeding toes should be kept away from the rest until they are completely healed.

DISEASES

When purchasing birds, always procure them from uninfected flocks. Keep the new birds isolated from the flock for a few days to make sure they are not diseased. Frequently during shipment birds catch colds, and if introduced to the flock immediately upon arrival may cause the spread of colds throughout the entire flock.

Immediately separate from the flock any bird that shows symptoms of disease. When it is desired to determine the nature of the disease, ship by express live affected birds to the Biological Laboratory, Ottawa, Canada. The express charges are paid by the Laboratory. It is important to send complete information with the material; care should be taken to have the name and address written plainly.