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ILLUSTRATED LECTURE ON THE
PRODUCTION OF POULTRY AND EGGS
ON THE FARM

By

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CONTENTS

	Page		Page
Introduction	1	Marketing	11
Breeds	1	Egg Production	13
Community Breeding	2	Feeding Laying Hens	13
Houses for Breeding and Laying Stock	3	Breeding	16
Hatching the Chicks	5	Lice and Mites	16
Natural Incubation	5	Poultry Diseases	17
Hatching Chicks with an Incubator	6	Marketing Eggs	17
Natural Brooding	6	Selling the Eggs	18
Artificial Brooding	7	The Consumer	18
Feeding Young Chicks	8	The Commission Man	18
Maturing the Pullets	9	The Country Store	19
Meat Production	9	The Huckster	19
Broiler Production	10	The Poultry Packer or Egg Buyer	19
Roaster Production	10	The Cooperative Creamery or Association	19
Fowls and Cocks or Roosters	11	Storing or Preserving Eggs	20
Capons	11	Appendix	21



U. S. DEPARTMENT OF AGRICULTURE,
STATES RELATIONS SERVICE.

A. C. TRUE, DIRECTOR.

In cooperation with the Bureau of Animal Industry, A. D. Melvin, Chief.

SYLLABUS 17.—ILLUSTRATED LECTURE ON THE PRODUCTION OF POULTRY AND EGGS ON THE FARM.¹

By HARRY M. LAMON,

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INTRODUCTION.

Practically every farmer is a poultryman in the sense that he keeps poultry. Comparatively few farmers attempt to make poultry keeping the principal activity on the farm, but content themselves with keeping a small flock. Such a flock works into the economy of the farm to the best advantage, being maintained at a small cost and making use of many materials which would otherwise go to waste, and provides a valuable adjunct to the home meat supply. It also provides a source of income which, while composed of small amounts individually, is spread over practically the entire year, and is often sufficient to clothe the family and pay the grocery bill. The farm poultry flock is therefore of the greatest importance, and because of its almost universal existence on the farms of the country produces an income which, in the aggregate, is of enormous magnitude. The value of the poultry and eggs produced in 1913 is estimated at \$578,000,000. (Ref. 1, p. 16; Ref. 11.) By far the greater part of this is produced on the general farms. Men capable of handling large poultry farms successfully are very few, and in consequence the successful poultry farms and the poultry products from them are of minor importance.

View.

1

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BREEDS.

While the average farmer has no interest in the production of fancy poultry, he should keep some one standard variety or breed rather than a mixed lot of mongrel or dunghill fowls.

¹This syllabus has been prepared by direct cooperation between the author and J. M. Stedman, Farmers' Institute specialist, of the States Relations Service, and is designed to aid farmers' institute and other extension lecturers in presenting the subject before popular audiences. The syllabus is illustrated with 51 lantern slides. The numbers in the margins of the pages refer to the lantern slides as listed in the appendix.

View.

Aside from the natural pride which he will feel in the possession of a uniform flock of some recognized variety and the general air of prosperity which it lends to a farm, there are decided practical advantages to be urged for such a course. His product both in eggs and fowls will be much more uniform in character and this will often bring an increased price. Then, too, there is nearly always an opportunity to sell some eggs for hatching or stock for breeding purposes at an advance over market prices.

The breeds may be divided into three general classes as follows: (1) Egg breeds, (2) general purpose breeds, and (3) meat breeds. The egg breeds include the lighter, smaller, more active breeds, such as the Leghorns, Campines, Anconas, Minorcas, and the Mediterranean breeds in general. These breeds are known as heavy egg producers and are those commonly kept on large egg farms. (Ref. 2.) The general purpose breeds include the breeds which are medium in weight, size, and activity, such as the Plymouth Rocks, Wyandottes, Rhode Island Reds, and Orpingtons. They are known as good egg producers, and also as producers of desirable carcasses for the table. (Ref. 2.) These are the breeds most commonly kept on the general farms throughout the country, and are the best adapted for this purpose. The meat breeds include the heaviest, largest, and least active of the breeds, such as the Cochins, Brahmas, Langshans, Cornish, and Dorkings. They are especially adapted to the production of large carcasses for the table. (Ref. 2.) In many instances, such as the soft roaster trade of the South Shore district in Massachusetts, the breeds of this class have been largely replaced by the general purpose breeds. (Ref. 10, p. 1.)

COMMUNITY BREEDING.

In selecting a breed if one is in a locality well known for any particular variety, it is well to select that variety for his use. The fact that one kind of fowl is largely kept in a community insures a uniform product both in poultry and eggs and makes it possible to combine the product of several farms for marketing to the best advantage. The reputation which a community can and has established for a particular product is often responsible for a premium in selling price, and the individual farmer should take advantage of this ready-made reputation. The fact that it is well known that many fowls of one variety may be found in a comparatively small area often will lead buyers of breeding stock or of eggs for hatching to come to that section to purchase what they desire. Another advantage which should not be overlooked is the possibility for the farmer

to purchase new blood for breeding purposes near by and he will have a large number of flocks from which to select. The possibilities of community breeding are great and are well worth the serious consideration of the people in any section.

View.

Two of the best examples of community breeding in the United States are the Little Compton district of Rhode Island, famous as a Rhode Island Red center, and the Petaluma district of California, famous as a White Leghorn center. (Ref. 3, p. 316.)

13

14

HOUSES FOR BREEDING AND LAYING STOCK.

The productive, profitable hen must be happy, healthy, and comfortable. One of the essentials for this is proper housing. While there are many different types of suitable and successful houses, there are certain essentials in poultry-house construction which must be observed for best success. Those prime essentials are fresh air, sunshine, dryness, freedom from drafts and space enough to keep the hens comfortable. No particular style of house is peculiarly adapted to any section of this country, but it is preferable to build more open houses in the South than in the North. The location of the house should have good water and air drainage and be convenient. Wherever possible a southern or southeastern exposure should be selected. A light, well-drained soil is preferable to a heavy soil. (Ref. 4, p. 1.)

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Light and sunshine are secured either by glass windows or an open front or by a combination of the two. A large amount of glass makes the house warm during the day, but cold at night. The open front is usually provided with an unbleached muslin or light duck curtain which can be used to close the opening during stormy weather or on cold nights. The cloth should be thin enough to allow a slow circulation of air through it. The front of the house should be high enough, and the windows or openings so placed as to allow the sun's rays to extend well back. (Ref. 4, p. 10.)

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The open front is the best means of ventilation. It can also be secured by means of the windows, but there is always danger that the windows will be kept too closely shut, particularly during the winter. Freedom from drafts is secured by making the sides, back, and roof absolutely tight. In a long house drafts are sometimes troublesome and may lead to colds. They may be overcome in such a house by constructing solid partitions at intervals. Dryness is very essential. Where the house is dry, there need be little fear of bad effects from cold weather. No appreciable frost will be found in a dry

17

View. house. Dryness is secured when the ventilation is good. These two attributes, good ventilation and dryness, go hand in hand.

The necessary amount of floor space per hen is very largely a matter of management. From 2 to 5 square feet per hen should be allowed. For the farm flock which has its liberty, an allowance approaching the lower limit will be satisfactory. (Ref. 4, p. 2.)

The roof must be water-tight, and is the most expensive part of the poultry house. Shingles, roofing paper, metal, or battened boards may be used for the roof. Shingle roofs require one-third pitch while the paper or metal covered roofs may be much flatter. The shed or single-slope roof is easiest to build, and is best adapted for houses up to 16 feet in width.

18 For wider houses, the combination, gable or semimonitor houses are good. (Ref. 4, p. 3.)

The floors may be dirt, board, or cement. Where dirt floors are used, the drainage must be good to keep the floor dry, and should be from 2 to 6 inches higher than the outside ground. Board floors harbor rats and do not have a very long life. They should be raised some distance off the ground, and are best adapted to colony or movable houses. Cement floors are only adapted to permanent houses. They are easy to clean and are rat proof. As they tend to be cold, a deep litter should be used on them. (Ref. 4, p. 15.)

19 For the average farm flock of 100 hens, a permanent or non-
movable house is generally used. Colony or movable houses
20 holding from 25 to 50 hens can also be used. In any case it is
better to give the hens their liberty, for by so doing they are
enabled to pick up a very considerable portion of their living
at many times of the year and to save much that would other-
wise go to waste. It is better to wire in the garden than to
wire in the hens. Where a house with yard is used, it is desira-
ble to have yards both in front and in the rear of the house.
By alternating the use of these yards, greer feed can be raised
on them, and the cultivation they receive will do much to keep
them sweet and free from taint. (Ref. 4, p. 2.)

21 The poultry house must be suitably, but not elaborately,
equipped. It should have sufficient roosting room to allow
each hen about 8 to 10 inches of roost according to the size
of the bird. A platform under the roosts to catch the drop-
pings is desirable, as it helps to keep the house clean. Nests
should be provided in sufficient numbers so that there is one
nest to every four or five hens. A water pan or pail must be
provided and should be placed on a raised platform to keep the

water free from the straw or litter which the hens would otherwise scratch into it. (Refs. 4, p. 10; 10, p. 9.)

The cost of poultry houses varies over a wide range. They should be built as simply and therefore as cheaply as possible, consistent with good construction, and the embodiment of the features essential to the welfare of the hens. Substantial poultry houses can be built for from 80 cents to \$1.60 per head, including labor. The cost of material per head will vary from 50 cents to \$1.

HATCHING THE CHICKS.

One of the greatest stumbling blocks to poultry keeping is the successful hatching and rearing of chicks. On the assumption that half the flock of laying hens is to be replaced each year, and that on the average half of the eggs set hatch and 80 per cent of the chicks hatched are reared, it is necessary to set five or six times as many eggs as there are pullets desired in the fall. Some selection of the eggs for hatching will pay. No abnormal eggs, either in size, shape, or shell texture, should be selected. The eggs should be collected two or three times daily, and should be kept where the temperature is between 50° and 60° F. If the eggs are to be kept for more than a week before setting, they should be turned daily. It is better not to select badly soiled eggs, and in any event the eggs should not be washed, though they may be cleaned with a slightly dampened cloth. The eggs for hatching should be from strong, healthy, well-fed breeding stock for good results and strong chicks. February, March, and April are the best months to hatch. (Refs. 5, pp. 1, 2, 4; 10, p. 8.)

NATURAL INCUBATION.

With a flock the size of the average farmer's flock, and with fowls of the general purpose breeds, natural incubation or hatching with hens is the more satisfactory. As soon as a hen shows that she is ready for setting, she should be dusted thoroughly with insect powder and removed to a nest previously prepared for her. This nest should be about 15 inches square by 15 inches high, and arranged so that she can be shut in. The nest should be in a quiet place where the hen will not be disturbed, never in the regular laying house. Put a china egg or two under her and leave her shut on the nest. Toward the evening of the second day let the hen come off for feed and water, and if she returns to the nest replace the china eggs with the eggs to be incubated. In cool weather it is best not to put

- View. more than 10 eggs under a hen, while later in the spring 12 to 15 can be used, according to the size of the hen. (Ref. 5, p. 5.)
- 22 It is desirable to set several hens at the same time. Then, as the infertile eggs are tested out, the eggs can be redistributed under the hens, leaving one or more free to incubate fresh settings. The eggs should be tested about the seventh day, to remove the infertile eggs and those showing dead germs. On the fourteenth day they should be tested again. (Refs. 5, p. 6; 10, p. 8.)

HATCHING CHICKS WITH AN INCUBATOR.

- Where comparatively large numbers of chicks are to be hatched or where nonsitting birds, like the Leghorns, are kept, it is necessary to hatch with an incubator. In buying an incubator it is poor economy to purchase a cheap machine, as they are less reliable. (Ref. 5, p. 8.) In setting up the incubator, care must be taken to see that it is level. The thermometer should also be tested by comparing with some thermometer known to be correct. (Ref. 5, p. 10.) The incubator is most commonly and perhaps most successfully run in the cellar. Any room where the temperature does not change too greatly and which is not too dry is satisfactory. There must also be sufficient ventilation to keep the air fresh and sweet. (Ref. 5, p. 9.) The incubator lamp must be kept clean and well trimmed, both to insure proper heating of the machine and to reduce to a minimum danger from fire. Also use good oil. (Ref. 5, p. 11.) When the bulb of the thermometer rests directly on the eggs, the temperature is usually held at $101\frac{1}{2}^{\circ}$ to 102° F. the first week, 102° to 103° F. the second week, and 103° F. the third week. The instructions furnished with the incubator should be followed carefully in regard to the temperature at which to run the machine and in regard to turning and cooling the eggs. After the eggs begin to hatch, the machine should not be opened until the hatch is completed, which ordinarily is from the twentieth to twenty-first day. Frequently it is necessary to provide moisture to the machine. This can be done by sprinkling the eggs with warm water, or by sprinkling the floor of the incubator cellar. The size of the air cell of the eggs is an index to the need of moisture. (Refs. 5, pp. 11, 12, 13, 14; 10, p. 8.)

NATURAL BROODING.

The hen should remain on the nest and brood the chicks for at least 24 hours after hatching is over, but she should be fed as soon as possible to keep her quiet. Often it is desirable to

give a hen more chicks to brood than she hatched. She will successfully brood 10 to 15 chicks early in the season; later, in warm weather, from 18 to 25, depending on the size of the hen. Powder the hen with insect powder before removing her and the chicks to the brood coop. The hen should be dusted every two weeks, or oftener if necessary, until the chicks are weaned. If lice become thick on the chicks, or if they are troubled with "head lice," a very little grease, such as lard or vaseline, may be applied on the head, neck, under the wings, and around the vent. Too much grease must not be used, as it will stop the chicks' growth or even prove fatal. All chicks should be toe punched when removed to brood coop or brooder, so their age and breeding can be determined at any later date. (Ref. 6, pp. 2, 3.)

View.

The hen and chicks should be moved from the nest to a brood coop. The hen is confined in the coop while the chicks can run out. They will not go far, however, and can always return to the hen to get warm. When hens are allowed their liberty, some of the weaker chicks are likely to get left behind, become chilled, and die. (Ref. 6, pp. 3, 4.) The brood coop should be cleaned at least once a week and must be kept free from mites. When mites are found the entire interior must be thoroughly cleaned and sprayed, or painted with kerosene or crude petroleum. (Ref. 6, p. 3.) From 1 to 2 inches of sand or dry dirt, or a thin layer of straw or fine hay, should be spread on the floor of the coop. Brood coops should be moved weekly to fresh ground, preferably where there is new grass. Shade must be provided, especially in warm weather. A cornfield makes fine range for young chickens, providing bugs and worms in plenty and abundance of shade. (Refs. 6, p. 3; 10, pp. 8, 9.)

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ARTIFICIAL BROODING.

Where brooders are used the chicks are left in the incubator from 24 to 36 hours after hatching without feeding. They are then removed either to an indoor brooder in a colony house or to an outdoor brooder. (Ref. 6, p. 7.) These brooders have a capacity of from 50 to 100 chicks, and the heat in each case is furnished by a lamp. A cheap brooder is not an economical purchase as the danger from fire is considerable. The brooder must be carefully set up and should be run for some time until the heat under the hover is properly regulated before putting in the chicks. The temperature should be maintained at from 90° to 100° for the first week or 10 days and gradually reduced to 85° for the following 10 days, and then lowered to 70° or 75° for as long as the chickens need heat, which may be from 4

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View.

to 10 weeks, depending on the weather. (Ref. 6, p. 11.) When chicks are first put into the brooder they should be confined under or around the hover by means of a board or wire frame. This can gradually be moved away from the hover until the chickens are 3 or 4 days old and have learned to return to the source of heat, when it may be discarded entirely. The brooders and hovers should have from one-half to 2 inches of sand, dry dirt, cut clover, or chaff spread over the floor. The hovers and the brooders must be kept clean and free from mites. (Ref. 6, pp. 11, 12.)

FEEDING YOUNG CHICKENS.

The young chicks may be fed any time after they are 36 to 48 hours old, whether with hen or in brooder. They should be fed from three to five times daily. Faster growth can be secured by five daily feeds, but it requires greater skill not to overfeed. Never feed more than enough to satisfy their appetites and to keep them exercising, except at the evening or last meal when they should be given all they will eat. Johnnycake for chicks may be made as follows: 1 dozen infertile eggs, or 1 pound sifted beef scrap to 10 pounds corn meal; add enough milk to make a pasty mash, add one tablespoonful of baking soda, and bake. Dry bread crumbs mixed with hard-boiled eggs, making about one-fourth of the mixture eggs, or rolled oats in place of the bread crumbs makes a good chick feed. Feed the bread crumbs, rolled oats, or johnnycake mixture five times daily the first week, then gradually substitute for one or two feeds of the mixture finely cracked grain of equal parts by weight, cracked wheat, finely cracked corn, and pinhead oatmeal or hulled oats, to which about 5 per cent of cracked peas or broken rice and 2 per cent charcoal, millet, or rape seed may be added. A commercial chick feed may be substituted if desired. This can be fed until two weeks old when they should be placed on grain and a dry or wet mash mixture. A good growing mash, composed of two parts by weight of bran, two parts middlings, one part cornmeal, one part low-grade wheat flour or red dog flour, and 10 per cent sifted beef scrap, may then be placed in a hopper and left before them at all times if fed dry. If fed wet only enough moisture (either milk or water) should be added to make the feed crumbly, but in no sense sloppy. When this growing mash or mixture is not used, a hopper containing bran should be accessible to the chickens at all times. As soon as the chicks will eat whole wheat, cracked corn, and other grains the small-sized chick feed can be eliminated. Growth can be hastened

by giving sour milk, skim milk, or buttermilk to drink. (Refs. View. 6, pp. 12, 13, 14; 7, p. 31; 10, p. 10.)

After the chicks are weaned by the hen or are old enough to do without brooder heat, they can be put in small movable colony houses or the hovers removed from the houses which they already occupy. These houses can then be moved wherever desired and the chicks thus allowed the most favorable range. As the chicks grow large enough so that the sexes can be readily distinguished, separate the cockerels from the pullets. Most of the cockerels should be marketed as broilers and this will relieve the crowding caused by the growth of the chick. Only the cockerels desired for breeding purposes should be saved. (Ref. 7, p. 33.)

31

MATURING THE PULLETS.

After the sexes are separated the pullets should be allowed to range until time to put them in winter quarters. It is essential that they be kept growing so that they will mature in time to start laying before the cold weather of winter sets in. When the pullets are about to begin to lay, or before cold weather sets in, they should be transferred to the laying house. To teach them to roost and lay there, they should be shut in for a few days, and, when let out, this should be done toward evening. Then as long as the feeding is done in this house, little trouble will be experienced about their roosting elsewhere. When the pullets are put in winter quarters it is an excellent plan to leg band them. This will definitely identify each hen and will enable the owner to know her age and consequently to know when to market her in later years.

32

The production of the farm poultry flock may be divided into two parts: First, meat production: and second, egg production.

MEAT PRODUCTION.

Poultry as meat producers have a peculiar and unusual value. Poultry flesh is not only very palatable, but the carcasses are of such a small size that the fowls may be killed at any time of the year and consumed without danger of spoiling. This enables the farmer to enjoy fresh meat at any time, which might otherwise be a great rarity in the summer. In addition, as the fowls pick up a large part of their living, utilizing much of what would otherwise be wasted, the meat produced by them is in a great sense a by-product of the farm, and consequently most economically produced.

BROILER PRODUCTION.

View.

Broilers are young chickens weighing from $\frac{3}{4}$ to $2\frac{1}{2}$ pounds. They are mainly the surplus males raised with the pullets. These surplus males marketed while young are still very tender, and are in great demand. The prices early in the spring are very good, often ranging as high as 30 cents or more per pound. Later in the summer when the great majority of the chickens reach suitable size for broilers the price is greatly reduced. Chickens destined to be marketed as broilers are raised with the other chickens and are usually simply caught up and marketed without any attempt to fatten them. As a consequence many very thin broilers are thrown on the market and do not sell to advantage. It would pay the farmer well to feed for a couple of weeks the cockerels to be marketed, as they are in condition to make gains readily and cheaply. This can be done either by shutting them in coops or fattening crates or in a pen or colony house with only a small yard. When allowed their freedom they take so much exercise that it is difficult to make them put on much flesh. (Ref. 7, p. 34.)

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RATIONS.

The following are suitable rations for this purpose:

- 3 parts, by weight, of corn meal.
- 2 parts, by weight, of low-grade wheat flour.
- 1 part, by weight, of shorts or middlings.
- or,
- 60 pounds corn meal.
- 40 pounds shorts or middlings.

If mixed with milk, which is preferable, the material should be of a consistency like that of oatmeal porridge or so that it will just drip from the tip of a wooden spoon but not run. If mixed with water it should not be fed in a sloppy condition, but as a crumbly mass. (Ref. 8.)

ROASTER PRODUCTION.

Roasters are mainly chickens weighing from 3 to 4 pounds, and are both males and females. They are principally of the general-purpose breeds. The young fowls marketed at this weight usually have developed a good frame, but unless they are especially fed just before marketing are often in poor flesh. They are, however, in good condition to put on flesh, and it would pay the farmer or poultryman to feed them either in crates or in small pens for 10 days to 2 weeks before selling. There is scarcely a farmer that would think of marketing hogs or steers without making some attempt to finish or fatten them

just before turning them off, yet it is seldom that any attempt is made to fatten poultry before they are marketed. (Ref. 7, p. 34.) View.

FOWLS AND COCKS OR ROOSTERS.

Most of the chickens marketed as fowls are hens, and often old hens. When the farmer thinks that a hen has outlived her usefulness as a profitable egg producer he very properly markets her. The only difficulty in this proceeding is that he seldom has marked his hens either by toe punch or banding so that he can tell their ages. As a result he is almost as likely to save the old hen after she is no longer profitable as to save the younger and more profitable hen. Usually hens should be marketed at the end of their second laying year. They should be marketed just as soon as they begin to molt, for their egg production after this time will be very small. The old cocks marketed are mainly surplus males which have been allowed to live too long. They are tough and stringy and bring the lowest prices of any class of poultry. All males should therefore be marketed as broilers or as roasters or caponized, except the few actually needed for breeding.

CAPONS.

Capons are unsexed males. The best breeds for caponizing are the general-purpose and meat breeds. The operation is not difficult after a little practice, and is performed to the best advantage when the cockerels weigh about 2 or 3 pounds. The operation makes the bird very quiet and docile, and they grow for a longer period of time and fatten more readily than cockerels. They are not marketed as a rule until after Christmas. The prices in many markets are very good. The advisability of caponizing surplus cockerels depends upon local conditions, particularly the demand for capons and prices paid. If prices are not high, it will pay better to market the surplus cockerels as broilers. (Ref. 9.)

34

MARKETING.

Poultry sold from the farm is usually shipped alive. Unless sales are made direct to consumers, it will not pay ordinarily for the farmer to kill and dress his poultry. The fowls are shipped in coops by express or freight. The coops should be high enough to allow the fowls to stand erect, and the bottom should be solid to prevent injury to the feet when the coops are stacked. Inch mesh wire for the top of the coop will prevent the chickens sticking their heads through and will prevent injury and loss which might otherwise occur.

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View.

A coop 2 feet 4 inches wide, 3 feet 10 inches long, and 1 foot deep with a partition through the center, which will hold 24 hens in temperate weather and either 20 or 30 head in hot or cold weather, respectively, is satisfactory. A coop of this size will accommodate about 35 chickens in moderate weather. (Ref. 12, pp. 9, 10.)

36

The fowls should be well fed and watered just before they are shipped. When fowls are shipped in large numbers stock cars are often filled with the coops and shipments made by freight. Special cars for live poultry are also used for car-lot shipments. An attendant accompanies these cars, and feeds, waters, and cares for the fowls. (Refs. 7, p. 39; 12, p. 10.)

When it is desirable to kill and dress the fowls before shipment they should be thoroughly bled and cooled until all the animal heat is out of the body. Unless this is done the carcasses will be very likely to spoil in transit and be a total loss. When dressed poultry is shipped from the farm it should be first cooled and then packed in clean containers, which can be packed in ice and shipped by express in such a way that the poultry does not come in contact with the ice or drippings. Shipments of single fowls may be made in favorable weather by parcel post. (Ref. 7, p. 39.)

Unless the market calls for dry-picked poultry, or unless the farmer is quite expert in dry picking, he will probably find it more advantageous to scald pick. Certain markets demand dry-picked birds. In such a case the farmer should learn to kill and brain so that the feathers may be removed without tearing the skin. Fowls should be picked clean and the head and feet left on. No attempt should be made to draw the fowls as they will keep better undrawn provided they are properly cooled. (Ref. 7, p. 39.) Capons must have the feathers on the upper portion of the neck, of the last two joints of the wings, the tail feathers, and about one-third of the feathers on the thighs from the hock joint up, left on. These feathers are characteristic of capons, and their removal might result in the birds being sold for something else besides capons. Since these feathers must be left on, it necessitates the dry picking of the capons.

37

In commercial establishments, where the fowls are dry picked and cooled in refrigerated rooms, they are carefully graded into the different classes and for uniformity of size. They are then packed in boxes holding one dozen, and frozen solid before being shipped in refrigerator cars. On the farms it is only possible to grade by placing the fowls in good condition and of a good appearance together, leaving the

poorer ones for a separate package. Such a grading will pay ^{View.} as it adds to the uniformity and attractiveness of the fowls, and often results in a better price.

EGG PRODUCTION.

The egg is one of the most important articles of food. It is practically a household necessity. Not only is it necessary in preparing many dishes, but is a valuable adjunct to the meat supply. A highly nutritious product, tempting alike to the delicate and the rugged appetite, it is not only a most useful food but a most convenient one, both in the matter of time and effort required to prepare it for consumption. The egg has also many uses in the arts. (Ref. 13.)

FEEDING LAYING HENS.

The production of eggs is one of the most important branches of the poultry industry. In consequence the feeding of laying hens has the maximum egg production for its object. There are many rations fed, some best suited to certain conditions, and some to others. Successful feeding of laying hens must take into account the following considerations: Nutrition, variety, palatability, succulence, and certain special requirements.

Rations fed to hens should be made up so far as possible from the material easily obtained in any particular locality. In addition the ration should be as simple as possible, consistent with good egg production. Corn either cracked or whole is the most common grain fed. It is a good feed, but should not be used alone. Wheat is a good grain feed, and is relished by the hens, but is more expensive. Oats is often used. Other common grains sometimes used are buckwheat, barley, milo maize, and Kafir corn. The grains fed to hens are usually mixed together. A good mixture is equal parts by weight of wheat, oats, and corn. (Refs. 7, p. 19; 10, p. 10.) The grain mixture is usually fed in the morning and at night. The morning feed should be very light, while at night the hens are fed about all they will eat. The grain should be fed in the litter of straw or other material on the henhouse floor so that the hens are required to exercise by scratching for it. Consequently the feeding must be done at such times that the hens will have enough daylight to secure the grain.

A mash composed of ground grain and other products is usually fed in conjunction with the grain. Wheat bran,

View.

wheat middlings, corn meal, corn chop, gluten meal, linseed meal, cottonseed meal, ground oats, and beef scrap, fish scrap, or meat meal are the most common ingredients of mash mixtures.

The following is a simple mash mixture which gives good results: Equal parts by weight of corn meal, wheat bran, wheat middlings, and beef scrap.

The mash mixture may be fed either wet or dry. If fed wet, it may be mixed with water, preferably hot, and care should be taken to mix the mash thoroughly. Skim milk, buttermilk, or sour milk is most excellent material with which to mix a mash. The mash should be in no sense sloppy or sticky, but simply crumbly. Wet mash may be fed at morning, noon, or night, and is usually fed only once a day. Noon is generally considered a favorable time to feed it. Only as much should be fed as will be eaten up in 10 or 15 minutes. If fed dry, the mash mixture is usually put in a hopper and left where the hens can help themselves at all times. The hens do not like the dry mash well enough to load up on it, but will eat a little at a time and frequently.

38

Where the hens have liberty, as a farm flock should, there will be many times of the year when they will pick up a large part of their feed. The amount of grain to be fed will therefore vary with the amount of feed available to the hens. The feeding of a dry mash in a hopper is well suited to this condition of affairs, as it guards against the hens not getting a sufficient supply of feed.

Some form of animal feed is essential for good egg production. It may be fed in the form of beef scrap, either by itself in a hopper or as a part of the mash, or it may be provided by table scraps, some form of milk, or at certain seasons by the bugs and worms which the hens pick up. Green bone may also be used. This is somewhat difficult to prepare and is hard to keep in good condition. If fed in too large quantities it will cause diarrhea, so that when feeding this material it is necessary to watch the condition of the droppings carefully, and at the first sign of a serious diarrhea to cut down the amount fed. If other animal feed is not available it will pay to buy and feed a good grade of beef scrap even though it seems an expensive feed. Perhaps no other ingredient is so often lacking in a ration for hens as a sufficient supply of animal feed. (Ref. 7, p. 22.)

Some form of green or succulent feed must also be supplied during the winter. Cabbage, beets, or clover or alfalfa hay

may be used. When grass or any green growing crop is available, it is not necessary to supply green feed. Sprouted oats are also satisfactory. The oats should be soaked for 12 hours in warm water and then spread out in a layer of from one-half to one and one-half inches deep on a floor, or in a tray or tier of flats which have openings or holes in the bottom or a one-fourth inch wire-mesh bottom covered with burlap so that the water drains freely. The oats may be stirred daily and sprinkled or allowed to sprout without stirring until ready for feeding. They are usually fed when from 1 to 1½ inches long, sometimes when 2 to 3 inches long. Oats need a moist, warm atmosphere in which to sprout quickly, so that it is necessary to furnish heat or to keep them in a warm room during the winter. During the rest of the year they may be sprouted outdoors. It takes from 6 to 10 days to sprout oats suitable for feeding, depending upon the temperature. Oats frequently become moldy while sprouting. To prevent this they may be treated with formalin. Use 1 pint of formalin to 30 gallons of water. Sprinkle this over and thoroughly mix with 30 bushels of oats, cover with a blanket for 24 hours, and then stir until dry. Sack these treated oats in bags which have been soaked in formalin and they may be held for a long time before sprouting. An insufficient supply of green feed often results in eggs with pale yolks. (Ref. 7, p. 23.) Where a plentiful supply of hard sharp grit or gravel is not available, this must be supplied and may be fed in the litter or in a hopper or box. Oyster shell should also be fed to prevent trouble from soft or thin shelled eggs. (Ref. 7, p. 24.) A plentiful supply of fresh, clean water is absolutely essential. If the hens do not have access to a natural supply, it must be furnished them. The pail, pan, or dish in which it is kept should not be exposed to the sun, and must be kept clean; the water must be changed daily. If put in the poultry house, the container should be elevated from the floor so that the hens will not scratch it full of litter. Hens, particularly when laying, drink freely, and certainly should not be stinted of such a cheap material as water. (Ref. 7, p. 24.)

The total cost of the feed for a hen for a year will vary considerably, depending upon the breed, the feeds available, and how much of the feed the hen is able to pick up. It is estimated it will run from 50 cents for a small flock on the farm to \$1.30 where all the feed has to be purchased.

View.

39

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BREEDING.

View.

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Good results in either egg or meat production can only be obtained from strong, healthy stock. Therefore it is essential to select for breeders only the strong, vigorous individuals. Certain external appearances are an index to vigor, such as good bright color, vigorous carriage, and strong bone, while the manner of growth is also important. Only those individuals making good, continuous, fairly quick growth should be used for breeders.

February, March, and April are the best months to hatch chickens. Pullets hatched during these months are more likely to begin laying in the fall before the cold weather sets in, while the cockerels can be sold as broilers to much better advantage than those hatched later in the season. In order to secure fertile eggs, it is necessary to mate up the birds a couple of weeks before beginning to save eggs for hatching. Some fertile eggs may be secured two or three days after mating, but for maximum fertility it is better to wait for a couple of weeks. The best number of hens to mate with a male varies with the breed. With the lighter breeds, such as the Leghorn, 1 male to 12 or 15 females; with the general purpose breeds, such as Plymouth Rocks, 1 male to 10 or 12 females; and with the heaviest breeds, such as the Brahmas, 1 male to 8 or 10 females will give good results. In general, cockerels will give better fertility than older males, but if the pullets from any particular male prove to be exceptionally good layers, that male should be bred as long as possible. Free range should be given the breeding stock, as it will do much to keep the breeders in good health and condition, and consequently to produce eggs capable of hatching strong, livable chicks.

LICE AND MITES.

42

A hen may be free from disease, be well fed and well housed, but if she is overrun with lice and mites she can not remain a good producer. As the mites only get on the hens at night and hide in the cracks and crevices of the henhouse during the day, the frequent spraying or painting of the roosts, dropping boards, and sides of the house with kerosene or crude petroleum will rid the house of them. If the hens have a place where they can dust themselves they will usually keep the lice down, but if they get bad, the hens must be thoroughly dusted several times at intervals of two or three days with some good insect powder. The hen when dusted should be held by the feet or on the lap and the powder worked well into the feathers. (Refs. 6, p. 2; 7, p. 48; 14.)

POULTRY DISEASES.

View.

Poultry is subject to a number of diseases. Proper management and housing conditions, however, will do much to keep the flock free from disease. It is only preventive measures which can be used with poultry to any great extent because the value of the individual bird is too small to justify the outlay of much time in treatment. All diseased fowls which it is desired to treat should be isolated. The common diseases are colds and roup, canker, chicken pox, gapes, scaly legs, and diarrhea. (Refs. 10, p. 11; 21.)

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MARKETING EGGS.

The demand is for fresh eggs. Since eggs are a very perishable product and quickly lose their quality, they must be quickly and frequently marketed and carefully handled if they are to reach the market in good condition. The price received depends very largely upon the condition and quality of the eggs.

The greatest loss in quality occurs on the farm. Stolen nests where the eggs are allowed to lie for days and are sat upon frequently by the hens when laying cause the eggs to be partly incubated and unfit for food. Broody hens allowed to remain in the laying house cause the same result. Broody hens should be removed from the laying house and confined until broken of broodiness. (Ref. 15, pp. 17, 24.) Dirty nests make dirty eggs. If marketed dirty they injure appearances and prices, and if washed their keeping qualities are injured. (Ref. 16, p. 29.)

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One of the greatest causes of loss is fertile eggs. They are responsible for all the blood rings in eggs. Any high temperature, whether in the house, on the way to town, or on the railroad causes the embryos in these fertile eggs to develop and result in poor eggs. Therefore produce infertile eggs. (Refs. 10, p. 12; 15, p. 40; 16, p. 30.) Storing the eggs in damp places may cause mold growths. Infrequent marketing will surely result in loss of quality. If nothing more serious happens to them as a result of dampness or high temperature they will lose a part of their white by evaporation and will not have as good a flavor. They will then sell for less as held or shrunken eggs.

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Although the greatest amount of loss or deterioration occurs on the farm, the same agencies which cause this loss there continue to work during the egg's journey to market and cause still further loss. Somewhere in the journey the eggs

View.

are candled and those unfit for food are thrown out. Others which are still edible but not of finest quality are separated and sold for a smaller price. This loss is of course passed back to the farmer or producer in the form of lower general egg quotations. It is urged that all farmers and poultrymen adhere strictly to the following rules in handling their eggs:

- (1) Keep the nests clean; provide one nest for every four hens.
- (2) Gather the eggs twice daily.
- (3) Keep the eggs in a cool, dry room or cellar.
- (4) Use all small and dirty eggs at home.
- (5) Market the eggs at least twice a week.
- (6) Sell, kill, or confine all male birds as soon as the hatching season is over, so as to produce infertile eggs.

SELLING THE EGGS.

Eggs produced on the farm will be sold through one of the following ways: Direct to the consumer, to a commission man, to the country storekeeper, to the huckster, to the poultry packer or egg dealer, or through a cooperative creamery or association.

THE CONSUMER.

When the eggs produced can be sold direct to the consumer without a considerable cost for delivery, this is the most satisfactory way to dispose of them, because of the better price received. Often it takes a considerable time to work up a desirable trade with consumers, and as they are usually located at some distance, it is necessary to drive in frequently with the eggs or to ship by express. Both these methods add considerably to the cost of delivery, and make it necessary to receive a decided premium for the eggs to have it pay. Shipment of eggs by parcel post has been tried, and it is claimed with considerable success. (Ref. 17.) In any case where eggs are sold directly to the consumer, it is essential in order to hold the trade that the quality of the eggs be of the very highest. To insure this, the eggs should not only be handled and marketed promptly, but should be candled before leaving the farm. (Ref. 22, p. 9.) A variation of this method of selling is to furnish eggs to some hotel, restaurant, or hospital.

48

THE COMMISSION MAN.

Selling to a commission man is undoubtedly the simplest and easiest method of disposing of eggs. Shipments of case lots or less are made by express to the commission man who attends to the details of selling and deducts a percentage for

his trouble. Where a reliable commission man is known, this is a satisfactory method of selling, particularly where the bulk of eggs produced is not great enough to justify much effort or expense in building up a private trade.

THE COUNTRY STORE.

In many sections of the country which are relatively far from the large markets it is customary and in fact almost necessary to sell or trade the eggs at the country store. The practice of these stores of buying the eggs simply according to number without regard to quality has been very harmful to the industry and has been responsible for a great deal of the loss by not offering any incentive for improvement of quality. (Ref. 18, p. 19.) Within the last few years the custom of buying "loss off" or on a quality basis has become more common and has resulted in a marked improvement in quality. (Ref. 16, p. 41.)

THE HUCKSTER.

In some sections an egg buyer or huckster travels from farm to farm by wagon buying eggs. The huckster usually pays cash, and often pays a very good price, particularly when his route is comparatively short and he ships the eggs which he gathers frequently. (Ref. 16, p. 35.)

49

THE POULTRY PACKER OR EGG BUYER.

The poultry packer is usually an egg buyer. He buys not only from individual producers, but also and mainly from the country stores and other agencies which collect eggs in numbers. The packer buys the eggs, candles and grades them, and then sends them to market in large lots, where they are either consumed immediately or put in storage for future consumption. (Ref. 16, pp. 35, 36, 38.)

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THE COOPERATIVE CREAMERY OR ASSOCIATION.

In a few localities where cooperative creameries have been successfully established the creamery has also undertaken to market the eggs produced by its patrons. The details of the scheme vary, but in general the creamery receives the eggs from the farmers when delivering their milk or cream or gathers them from the farms by wagons when gathering the cream, and attends to the details of marketing. Because of the fact that the milk or cream must be frequently delivered, and that it is little if any more trouble to deliver the eggs at the same time, the creamery is especially well situated to handle the

View. eggs and to market them in a good fresh condition, and in consequence to work up a select trade which pays well. In a number of instances this has been successfully done. In some other cases poultry men and farmers have formed associations for the purposes of pooling and marketing their eggs through a secretary or manager. If the association is large enough and enough eggs are handled to justify the services of a well-paid manager or if some painstaking individual can be found who will give his time, this method of marketing will often prove successful. (Ref. 19.)

STORING OR PRESERVING EGGS.

The great bulk of eggs are produced during the spring and early summer months, which is the natural breeding season. As a consequence, the price of eggs at this period is at its lowest point. Later in the year during the molting period of the fall and early winter the egg production is at its lowest point, and in consequence the price reaches its highest point. If there were no means of carrying over a portion of the eggs from the spring for use during the season of scarce production, the price in the fall and winter would be much greater, and in the spring much less than it is now. Cold storage, which is the best method of preserving eggs, is the commercial means which serves to even up to a considerable extent this variation in production. (Ref. 18, p. 25.) For home use where eggs can be obtained in a perfectly fresh condition in the spring water glass may be used to preserve them successfully until the following fall and winter. The eggs should be immersed in a 10 per cent solution of water glass when perfectly fresh, and must be kept covered with the solution. A crock or stone jar is the most suitable container and this should be kept covered and set in a cool place. (Ref. 20, p. 17.) Eggs preserved in this manner must never be offered for sale.

APPENDIX.

LANTERN SLIDES.

No. of
view.

- 3472-C 1. A well-bred farm poultry flock.
 4737-B 2. A large poultry farm.
 8463-B 3. Pair of S. C. White Leghorns.
 8464-B 4. Pair of Silver Campines.
 8465-B 5. Pair of S. C. Brown Leghorns.
 8466-B 6. Pair of Barred Plymouth Rocks.
 6474-B 7. Pair of S. C. Rhode Island Reds.
 6477-B 8. Pair of White Wyandottes.
 8467-B 9. Pair of Buff Orpingtons.
 5696-B 10. Pair of Buff Cochins.
 8468-B 11. Pair of Light Brahmas.
 8469-B 12. Pair of Cornish.
 2925-A 13. A poultry farm in the Little Compton district of Rhode Island.
 4029-C 14. A view at Petaluma, California, showing poultry farms.
 3957-C 15. Poultry house located so as to secure good air and water drainage.
 6513-B 16. Poultry house with open front and curtains.
 2522-A 17. A good type of open-front house for the South.
 8433-B 18. Types of roofs for poultry houses.
 6388-B 19. A good colony house.
 2526-A 20. Another good colony house.
 6386-B 21. Interior arrangement of a poultry house.
 2530-A 22. Hens and nests used for hatching.
 3269-C 23. Interior of an incubator cellar.
 3276-C 24. Brood coops for hens and chicks.
 5143-B 25. Hens and chicks in brood coops under good farm condition.
 712-A 26. Chickens raised on the edge of a cornfield.
 3262-C 27. Brooders with chicks.
 6392-B 28. Small colony house to use with indoor brooder and later as a growing house.
 3270-C 29. Chicks at feeding time, showing wire screen to protect feed of small chicks from larger ones.
 3260-C 30. Dry-mash hopper for growing chickens with cover as a protection from rain.
 2044-A 31. Colony houses on range for growing chickens.
 6525-B 32. Maturing the pullets on range.
 2873-A 33. Outdoor coops suitable for fattening cockerels.
 3623-C 34. Capon.
 7643-B 35. Coops of live poultry ready for shipment.
 6081-B 36. Car used for shipping live poultry.
 5608-B 37. Various styles of packing poultry.
 3264-C 38. Feed hoppers.
 3274-C 39. Sprouted oats ready for feeding.
 3273-C 40. Various styles of water dishes.
 3202-C 41. Strong and weak constitution in Barred Plymouth Rock females.
 6770-B 42. Dusting a hen for lice.
 5760-B 43. A case of roup.
 5757-B 44. A case of scaly leg.
 5745-B 45. A stolen nest.
 2313-A 46. Eggs on the way to market—exposed to the hot sun.
 3149-C 47. Poster circulated to encourage the production of infertile eggs.
 2950-C 48. Testing an egg.
 2422-A 49. An egg huckster's outfit.
 2507-A 50. A country egg-and-poultry buyer's establishment.
 3257-C 51. Eggs preserved in water glass—the crocks set in the cellar.

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