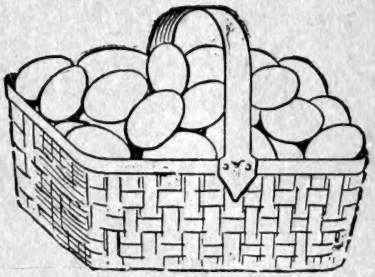
WINTER EGGS.

How to Get Them.



Selection, Care and Food of Laying Hens.

BY

JOHN H. ROBINSON,

Editor of Farm-Poultry.

PRICE, 25 CENTS.

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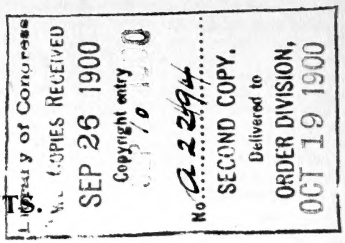

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WINTER EGGS.

INTRODUCTORY.

This little book treats of the hen as a producer of eggs. Of the breeding and early life of the chick it has nothing to say, except what may come in incidentally in telling what should be the foundation of good laying stock. Nor does it consider the effect of a season of heavy egg production on the after usefulness of a hen as a layer and breeder. For, though these are important matters in their proper place, it is not desirable that the novice who wishes to know first of all how to get eggs, and especially how to get them in fall and early winter when eggs are scarce and bring highest prices, should have the subject confused in his mind by an attempt to consider it in all its bearings at the same time. The old rule, "One thing at a time, and that done well," is a good one to employ here. So in this book I will treat only of the hen as an egg producer, and try to tell the reader how to get a good egg yield and at the same time keep his hens in good laying if not in good breeding condition throughout a year.

BEGINNING WITH PULLETS.

When Hatched?—It is necessary to state the case a little differently for different conditions. Let us take first the case of a poultry keeper who has growing a lot of pullets which he intends to keep as layers. We will assume that these pullets were bred from stock of good average laying capacity, and that they were hatched at such season that if they develop seasonably they may be expected to begin laying about October,—say, between September 15th and November 15th. If of one of the large Asiatic breeds, Brahmas, Cochins or Langshans, they were hatched between February 1st and April 15th, preferably early in March. If of a medium sized American breed, Plymouth Rock, Wyandotte, Rhode Island Red, or of a cross of an Asiatic and a Mediterranean variety they were hatched between March 1st and May 1st for the Rocks and for strains or stocks of the others which are large in frame and a little slow to mature; and between March 15th and June 1st for average Wyandottes, Reds and crosses. If of the small, Mediterranean and like breeds, they were hatched between April 1st and July 1st, the earlier half of the period being most desirable for stock that is large of its kind; while for average stock of these small breeds June is not too late to hatch pullets with good prospects of getting them to laying before Thanksgiving.

Age at which Pullets Lay.—I have been thus explicit in giving this information because I find that every fall many of those who are turning their attention to egg production want to know what they may expect from the stock in their hands, which was perhaps hatched without special thought of the time when the pullets would reach laying maturity; or what to expect from stock which they purpose buying; or what stock to buy for the purpose. If well fed and properly cared for, pullets of the kinds mentioned, hatched within the period specified for each kind can generally be counted on to come to laying maturity at the desired season. Some of the more precocious will lay earlier. If only a little earlier it does not make much difference; but if too precocious, (as when the earliest pullets begin laying in July), they do not as a rule turn out desirable layers: for very early laying is apt to be at the expense of better physical development, and, besides, the pullets which lay so early frequently molt like old hens, in the fall or early winter, and are of no further value as producers until spring.

Precocious Pullets.—If these precocious pullets lay good sized, marketable eggs, they may be kept until they begin to molt; but if they lay small eggs and lay irregularly it is better policy to market them. And throughout the season, as the later pullets come on, the keeper should mark the too

precocious ones as not desirable for his permanent stock, and dispose of them accordingly.

Slow Maturing Pullets. — There will also be some pullets slow to mature. When this is because they failed to make good growth, because they are stunted,—runts; they should not be reserved for layers. But when the pullets are well developed, and have the appearance of being about to begin laying, it need cause no uneasiness if they happen to be a little longer than the average of their sisters in getting down to business.

Late Hatched Chicks as Layers.—A question often asked is, "How late can I hatch chicks, and still make winter layers of the pullets?" This question comes most frequently from beginners and from those of limited experience whose early chickens have been lost. To such I would say that in hatching chicks later than the periods mentioned above people sometimes get the pullets to laying at the average age for the kind, but generally if these late pullets lay early it is at the expense of growth and stamina, and their period of usefulness as layers is therefore short; while if they obtain their full development before commencing to lay, no eggs are received from them until late in the winter when prices have fallen considerably. Let me add that the best course for the beginner who failed to get his pullets out seasonably and is depending on his own hatches is to let the matter

go over for another year. He has hardly a chance in twenty of making the late chicks pay. Numerous instances can be quoted showing where late chicks have made very profitable layers. But in reckoning probabilities we must consider what is usual rather than what is exceptional.

BUYING PULLETS.

Let us take now the case of a beginner who wishes to buy pullets for layers. He should take only pullets hatched within the period which has been specified for their kind, and well grown for their age. Beware of taking later pullets on the seller's assurance that with extra good care and a little forcing they can easily be got to laying in season to make them profitable egg producers. Beware, also, of pullets that have not made good growth for their age. Pullets stunted in the early weeks or months of their lives rarely overcome that setback, no matter how good the care and food.

Prices.—A matter of much importance to the buyer of laying stock is the price. It is frequently stated that early hatched pullets are worth $1.50 to $2.00, or even $2.50 each for egg production alone. Such statements are, on their face, absurd, and very few hens are sold for layers at such prices. Persons who buy hens for laying purposes, only, at such figures pay an excessive price for them. The reasoning by which these figures have been sup-

ported looks so plausible to the novice that it may be worth something to him to have the fallacy of it exposed here. Assuming that the pullet will lay, say, twelve dozen eggs within a year after beginning, that the eggs will sell for twenty-five cents a dozen (about the average for strictly fresh eggs near the eastern cities), and that then the hen sold for poultry will bring enough to pay for what it cost to keep her; it is argued that the owner of the hen cannot afford to sell her for less than $2.00 or $2.50. In other words, it will pay him better to keep the hen than to sell her for a lower price. But the question for the buyer is to buy the hen at such a figure that *he* can make something on her before her brief period of usefulness is over. Obviously if he pays $2.00 or $2.50 for a hen she will have to be an extraordinary layer to bring in enough for eggs to pay for herself, and food, housing and care in a year. For egg production alone, the object being to produce eggs for market, one cannot afford to pay much above their value as poultry for pullets. When the pullets are to be used for breeders as well as layers the case bears a different aspect which need not be considered here.

OLD HENS AS LAYERS.

Which to Keep.—So conflicting are the opinions of authorities on the question of keeping over old hens as layers, that the novice is generally at a loss

whose advice to take. Some advise killing off all the hens at about a year and a half old, replacing them with pullets of the season. I think that as good a rule for this case as has been offered is one I gave elsewhere some time ago: "One who is producing eggs for market should never dispose of a good layer while in good condition, unless he has more eggs than he can handle, or has another to take her place. Hens which as pullets laid well, kept in good condition, then began to molt early and promise to be in laying trim by Thanksgiving are always worth keeping unless their room is needed for something you are sure is better property. It is not merely a question of age. This mode of selection might result in keeping some hens until three or four years old, but the proportion of old ones in the flock would never be large, and no old hens that are not good layers need be kept.

Buying Old Hens.—As to buying hens for layers:—if the hens are certainly known to be young hens (in their second year) and are in promising condition, they might be a good investment. That would depend on whether or not one could get as many pullets of the quality wanted at a reasonable figure. The price, however, ought to be the market price of the hens for poultry. Hens past two years old should not be purchased for layers.

GETTING READY FOR WINTER.

Begin Early.—With suitable stock, the first right step toward putting pullets in shape is to get them into their winter quarters. The early part of August is not too soon to have the earliest pullets culled over and placed in lots of suitable numbers in the pens they are to occupy through the winter. The later ones may be left out in their chicken coops longer, but all should be in winter quarters before the cold fall rains begin. In this it pays to take time by the forelock. It is poor policy to delay moving the pullets until bad weather comes. Furthermore, it is of greatest importance that the move to permanent quarters be made before the ovaries begin to develop, as disturbances at that time may retard laying for weeks.

Have the House Ready.—Putting the pullets into winter quarters thus early presupposes that the houses have been made ready for them. Old houses should have been put in repair,—and both houses and yards thoroughly cleaned. New houses should have been completed earlier in the summer and given time to dry out thoroughly before any stock goes into them. These preparations and precautions are sometimes delayed without ill effects; but on the other hand thousands of poultry keepers every year lose money by disregarding them.

Don't Crowd Them.—The pullets should not be crowded. It is a mistake to think that until just about to begin to lay pullets can be crowded with impunity. To get good results, pullets that are shut up when half to three-quarters grown should have as much room as would be allotted mature hens in full lay. If anything, the growing pullets require more room. Poultry keepers see at once the need of giving pullets that are nearly grown as much room as hens, but are not so easily brought to see the need of giving as much room to the smaller ones. As has been stated, the smaller pullets may be left out a little later, but if they are brought into the winter houses while small they should not be crowded.

This brings us to the important questions,—How many laying hens should be kept in a flock? and,—How many square feet of floor space should be allotted to each hen?

HOW MUCH ROOM PER HEN?

As far back as I can remember, the rule for space given by authorities on poultry keeping has been ten square feet of house floor space to each hen. When keeping a large stock of laying hens for eggs I found it entirely practicable to disregard this rule, and got as good results in eggs when giving only four or five square feet of floor space to each hen as when giving ten square feet. I

knew many other poultrymen who had had the same experience. Two years ago (in 1898), using for the purpose a large number of reports furnished by members of the Farm-Poultry Experiment Club, I demonstrated that with ordinary good care in good quarters there was no difficulty in getting as good egg yields as we have any accurate records of with the floor space allotted to each hen five to six square feet when the flock numbered anywhere from twelve to forty. With smaller flocks it was necessary to allow more floor space to each hen to get as good results.

HOW MANY HENS IN A FLOCK?

These same reports showed also that, contrary to the usually accepted theory, it was just as possible to get large average egg yields from large flocks as from small ones. The difference in results, generally in favor of small flocks, being due not to the supposed fact that (for some mysterious reason) hens kept in large flocks would not lay as well as hens kept in small flocks, but to the fact that most poultry keepers do not succeed in feeding the large flock right. The indications were that very large flocks were generally underfed, or else not given enough exercise. I mention this that the beginner may know that if it would be more convenient for him to keep his hens in large flocks, they being given sufficient room, the egg yield from these

large flocks will depend on his learning to handle the large lots as easily as most people do smaller flocks. I do not advise keeping the hens in large flocks, for experience shows that most poultry keepers get better results with them in smaller lots, but if it is necessary to keep a large lot together one ought to get eggs just the same, and will if he handles the flock right. Most poultry keepers get better results with from twelve to twenty hens in each pen than when the numbers in the pens are much under twelve or over twenty.

HOW TO PREVENT COLDS.

Putting the pullets into winter quarters does not mean giving them winter care. Above all things the house must not be shut up close at night. It is both surprising and appalling what numbers of chickens are injured, or, maybe, ruined by being shut up close at night when first put into the houses. This, as often as exposure to cold and damp, is the cause of colds and roup. By night as by day, at this season the house should be kept as wide open as is possible without exposing the fowls to direct drafts when on the roosts. As most houses are built facing the south and with all windows and doors in or near the front, all glass sash may be removed during the summer, the windows being protected with wire netting if necessary, and the house thus becomes to all intents a shed, closed

on three sides and open on the fourth, which makes it quite the ideal summer house. Many poultry keepers who use scratching shed houses put roosts in the open shed during the summer, and also remove the sash from the window in the roosting room, thus giving the fowls plenty of roosting room for warm nights. The houses can be left quite open at night, except in case of cold driving rain, until it begins to freeze outside. Even after that they are better not closed entirely until it is cold enough to put a crust of ice on water in the house. Fowls thus cared for are not liable to colds from being overheated at night; nor, being gradually hardened up as the weather grows colder, are they so likely to take cold on the approach of severe winter weather as those which have been kept in closed houses. It might be added that fowls which have been accustomed to sleeping in rather close quarters are not always injuriously affected thereby. The trouble occurs when chickens, accustomed to sleeping in the open air or in airy coops, are suddenly transferred to quarters where there is a poor circulation of air.

FEEDING FOWLS.

Feeding fowls is by no means as difficult a matter as the novice who today finds some poultry and agricultural books and papers full of allusions to "scientific feeding" and "balanced rations" is likely to suppose. The beginner does best for

himself when he pays no attention to such supposedly scientific discussions of poultry feeding. It is not really necessary for a poultryman to know anything about the chemical composition of foods, or the how and the why of the various changes which accompany the processes of digestion, assimilation and egg production. If the amateur egg farmer has already acquired some such knowledge it should not be a disadvantage to him, and will not be unless he trusts to it rather than to the experience of successful practical poultrymen. But for every beginner who has neither practical experience in feeding fowls nor scientific knowledge of the articles used as poultry foods, the wisest course to pursue is to let the question of scientific feeding severely alone until the elements of practical poultry feeding have been mastered,—in other words, until one has acquired skill in using a ration which has been tested and found good. After that, if he is disposed to study the scientific phases of the feeding question, he may find such study interesting, and to some extent helpful, though I can assure him that not one poultryman in fifty ever has occasion to put to practical use a knowledge of the chemistry of poultry foods.

Science is Skill.—If it could be brought about, it would be desirable to make the terms "science" and "scientific" when applied to poultry feeding, refer exclusively to that kind of science which con-

sists in skill acquired by intelligent practice, for it is in acquiring such skill that one learns how to feed for eggs. I don't like the common expression, "feeding problem," because to most persons the idea of a problem is of something difficult because intricate and puzzling, while this matter of feeding fowls right is not difficult unless one deliberately makes it so. It is not a matter of learning what to feed, and how to compound rations balanced to exactly meet the requirements of the fowl, but of practice in feeding a particular lot, or lots, of fowls according to appetite, condition and results. And, as has been said, to acquire the art of good feeding is not difficult, for it is not required that the poultryman shall attempt the impossible and try to exactly balance the proportions and amounts of the various foods given the fowls against their needs. His part in feeding is to see that the fowls get enough and a sufficient variety of suitable foods, and that the conditions under which the fowls are fed are such as discourage gluttony, keep the digestion sound and the appetite healthy. For the sake of economy in feeding he must learn to feed in such quantities that there will be but trifling waste in rejected or fouled food; but if he follows an approved system of feeding he need not fear that there will be waste of food or damage to the fowls because the diet chances to contain a trifle less nitrogenous matter, or a little more car-

bohydrates than some writer on the science of feeding has given as the correct proportion.

The Appetite the Guide.— The appetite of the fowl is nature's provision for balancing the ration. Though in the artificial conditions imposed upon hens for the purpose of getting a more than natural egg yield, we cannot at some seasons get the results desired if we allow the appetite full control of the fowl's diet, the appetite must always be consulted; and in going contrary to the normal appetite of a healthy hen, we always run a risk of injuring her constitutionally and thereby defeating our purposes.

What is a Normal Appetite?— In this connection and in explanation of what has just been said, I would emphasize the distinction between a normal, or healthy, and an abnormal, or unhealthy, appetite; for it is important that the novice should know the difference and not allow an abnormal appetite in his fowls to govern his feeding. In healthy fowls which have always had a good variety of food fed under conditions insuring proper digestion, the appetite is normal. The fowl does not crave an excessive quantity of any one particular kind of food. But in fowls which have not been fed properly, which have been deprived of some needed article, there is generally a craving, an abnormal appetite for the kinds of

food in which their ration has been deficient, and if the opportunity is afforded the fowls will eat to excess of such articles, and sometimes kill themselves by doing so.

The best way for a novice to judge whether or not his fowls have natural, healthy appetites is to compare the quantity they would eat of any article with the quantity of that article recommended by experienced feeders. If it does not vary much either way, the appetite is all right. If the fowls seem to crave, and will eat inordinate quantities of an article it is evident that they have not been given enough of that kind of food. If they seem to care little for it, eating much less than the common allowance, it is apparent that they are getting or have recently had more of it than was good for them.

When the appetite is wrong it must be got back to the normal condition with as little delay as possible. When a fowl has been overfed on any article it is best to discontinue the use of that article altogether for a little while, and when you resume feeding it to begin with small quantities, gradually increasing until about the usual allowance is taken. When a fowl has been underfed of a particular article, do not allow it to eat all it wants of it. If the article is one that is fed daily, increase by a little the proportion of it used. If it

is one fed occasionally give the average allowance each time, but feed it oftener than usual until the fowl will eat only about the regular allowance.

Loss of Appetite.— In feeding hens for heavy egg production it is sometimes found that the hens begin to lose appetite generally; this indicates that the digestive system is a little overworked. It may happen even when fowls have plenty of exercise. The best way to rectify this condition is to omit a feed. The hens are almost certain to come to the next in good appetite. I found it a good plan, (which had the additional advantage of lightening the Sunday work — always too heavy on a large poultry plant) to give only two meals to yarded hens on Sunday.

Having said so much by way of explanation, let me repeat that healthy fowls with normal appetites may be fed according to appetite, both as to kind and quantity of any good ration, provided that they get the proper variety of food regularly, and are required to take a reasonable amount of exercise. This matter will be considered again after feeding formulas have been given.

Many Good Rations Much Alike.— All good rations are based on certain general principles of good feeding which may be summed up in the assertions that fowls are omnivorous, require exer-

cise to secure the proper digestion of food, and, like all other creatures, will not work for food more than is necessary. The rations which follow are based on the application of these general principles to the conditions under which each of those whose feeding method is given kept fowls, to the food articles most available in his locality, and to his convenience in doing his work.

MR. A. F. HUNTER'S METHOD.

The first method given is that of Mr. A. F. Hunter, of South Natick, Mass., for many years editor of *Farm-Poultry*, whose scheme of feeding is one of the best ever devised, and has probably been adopted with gratifying results by more poultry keepers than any other ever published. It is open to criticism in that the arrangements for cooking the mash were inadequate, and also on the ground that the experience of many others has shown that where corn is cheap cracked corn could be profitably used much more freely than in this ration. I would also point out that in feeding fowls for eggs only it is possible, as we have seen, to crowd the hens more than was done here. However, the method as a whole is an exceptionally good one, adapted to a wide range of circumstances, and anyone who follows it closely may know that if he does not get eggs, it is not the fault of the ration. I give Mr. Hunter's

description of his method in his own words, quoting from *Farm-Poultry*, November 15, 1897:

"Five mornings in the week we feed a mash made up of about a third cooked vegetables mashed fine, or cut clover cooked by being brought to a boiling heat in water, an equal amount of boiling water added, a heaping teaspoonful of salt to a bucketful; a heaping teaspoonful of Sheridan's Condition Powder two days, then cayenne one day, Condition Powder two days, then powdered charcoal one; and into this is stirred mixed meal until the mash is as stiff as a strong arm can make it.

"This mixed meal with us consists of one part each corn meal, fine middlings, bran, ground oats, and animal meal, a scoop or dipper of each being dipped in turn into a bag, and poured from the bag into the meal barrel from which it is dipped into the mash. We consider the thorough mixing of these meals a considerable factor in making a good mash.

"When we have cut fresh bone in abundance we omit the animal meal from the mixture; ordinarily we have only about half rations of cut bone to go round, so use regularly half the amount of animal meal to make up the deficiency. * * *

"The foundation of the mash is the cooked vegetables, which may be refuse potatoes, beets,

carrots, turnips, onions, (anything in the vegetable line), and into the pot goes the table waste, potato parings, etc., and the potato, squash and apple parings from the kitchen. The potatoes or beets, etc., are washed before putting on to cook, and the mess when boiled is sweet and savory. If one has a set kettle in which to stir up the mash, and there leave it to cook in its own heat and the heat of the brick work, they are fortunate. We haven't, and have to make ours up in common water pails.

"The vegetable or clover kettle is put on before sitting down to dinner, usually, and another kettle of water to be boiling hot when wanted. When the vegetables are cooked we set out four buckets in a row, dip out the vegetables into the buckets about equally, mash them thoroughly, add the salt,—*always*—and the condiment of the day, add boiling water till the bucket is two-thirds full, then stir in of the mixed meal till it is stiff and firm; then cover and set away to cook in its own heat.

"Clover rowen (second crop clover) cut fine makes an excellent foundation for the mash, and two or three days of the week in winter we use that instead of vegetables. We fill two kettles with the cut clover and as much cold water as they will conveniently hold, and heat to a boil.

The clover is ladled out into the buckets about equally, the clover tea added and boiling hot water as before, then salt and the stimulating condiment and the meal stirred in. * * *

"The morning mash is fed in troughs large enough so that all of the fifteen fowls in a pen can get about it at one time; another important factor, because if the trough is small some of the birds have to stand back and wait for the second table, and when their chance does come there is nothing left for them. With a trough four feet long by six inches wide there is plenty of room, and if a biddy is driven away from one place she runs around and goes to eating at another, and thus all get a share. * * *

"Our fowls have exercise ground in summer in yards 125 x 12 feet, which gives them a grass run (with growing grass always in the growing season), and they will take ample exercise in pleasant weather. To keep them out of doors the noon feed of whole barley (or buckwheat) and night feed (before sunset) of wheat is scattered upon a graveled space immediately in front of the houses. Each family of fifteen has a pen within the house twelve feet square, or one hundred and forty-four square feet of floor space, which gives about ten square feet per fowl. The floor is the earth covered about six inches deep with screened

gravel. On this gravel the grain is scattered in stormy weather, in spring, summer and early fall, when we want the birds to stay indoors. When cold weather approaches exercise must be stimulated, and we cover the pen floors three or four inches deep with chopped meadow hay or chopped straw, into which the grain is scattered, and the biddies have to dig it out. Some poultrymen use dry leaves from pen litter; chaff from a threshing mill would be most excellent (nothing could be better), and we have found one or two cases where common cornstalks were used. With us, straw or meadow hay is most easily obtained, and we use that. *What* the scratching material is, is of far less importance than that the scratching material is there.

"Whole wheat is the best grain food for fowls, whole barley is the next best, and buckwheat next. We make barley or buckwheat the noon feed five days in the week, and wheat the night feed five or six days in the week. We do not make the mash on Sunday, because we want to reduce the work to its lowest terms on that day, doing no more than the regular feedings and waterings, and collecting the eggs.

"Monday we feed oats (or barley), wheat, whole corn.

"Tuesday, mash, barley (or buckwheat), wheat.

"Wednesday, mash, cut bone, wheat.

"Thursday, oats, barley, wheat (or corn).

"Friday, mash, barley, wheat.

"Saturday, mash, cut bone, wheat.

"Sunday, mash, barley (or buckwheat), wheat.

"Two feeds of cut bone each week, one or two of whole oats, and one or two of whole corn, (according to the season), give variety to our ration, and to that is added whole cabbages hung in the pens in cold weather to tempt picking them to get green food; or turnips, or beets, or carrots are split in halves and placed in the pens to be picked to pieces and eaten.

"Ground oyster shells are always accessible, and fresh water, replenished three times a day, (warm in winter), and the water pans are carefully rinsed every day."

MR. C. H. WYCKOFF'S METHOD.

The next ration given is that used on the White Leghorn farm of C. H. Wyckoff (now Gray & Storke), Groton, N. Y., one of the most famous egg farms in the country.

Morning,— Mash compounded as follows: 1 bu. corn, 2 bu. oats, ground fine; to each 200 lbs. of this mixture add 100 lbs. bran, and 5 or 6 lbs. beef scraps; moisten with milk; feed in troughs, returning after ten or fifteen minutes to take up

any food that may be left, and give a second feeding where needed. At noon,— green food, mangels or cabbage in winter, clover or kale in summer; sometimes a light feed of mixed grain in litter. Night feed,— mixed grain, in winter 2 bu. each wheat, oats, buckwheat and corn; in summer the corn in the mixture reduced one-half.

COOKED VS. UNCOOKED MASHES.

The reader will notice that in this ration the mash is simply moistened—not cooked or half cooked as in the one given first. Though many poultrymen prefer a cooked mash, claiming that fowls do better on it; and though myself one of those who prefer the cooked mash because for me fowls have generally done better on a well cooked mash than on a half cooked or raw one fed with the same ration under the same conditions, I must say that it is a matter of record that a great many poultrymen get as good results with uncooked as others do with cooked food. It does not seem to make any difference, except that fowls accustomed to one system may not at first do so well when changed to another, and it is better to stick to one system than to be always changing back and forth.

MR. C. I. NESMITH'S METHOD.

On the farm of C. I. Nesmith, Reading, Mass., one of the model poultry farms of New England,

where some eight hundred laying hens are wintered annually, the feeding system and ration are:— Morning,—a full feed of some whole grain, generally wheat, but barley, oats, or buckwheat is often used. The grain is fed in litter to compel exercise. Noon,—a light feed of grain. Evening,—mash of dried bread, cut clover, beef scraps and mixed meals, well cooked and fed warm — not hot — all they will eat.

THE EVENING MASH.

It will be noticed that here the mash is fed in the evening. This farm was one of the first to adopt this method, which has become quite common, though the great majority of those who use a mash feed it in the morning. Advocates of the different systems will often insist that this one or that, whichever they prefer, gives better results. Available records of results indicate no difference on that score between the two systems. Feeding the mash in the evening is sometimes more convenient for the poultry keeper, and in such case it would seem to be preferable.

MR. E. O. ROESSLE'S METHOD.

The method used by Mr. E. O. Roessle, formerly editor of the poultry department of the *Country Gentleman*, and proprietor of a large poultry farm at Albany, N. Y., was given in his paper as follows:—

"I feed a mash every morning in the week, and continue it until I find my hens are getting tired of it; then I change to a grain feed for variety. The mash consists of one part bran, one part ground corn and oats, one part corn meal. This is all mixed together with hot water at night, covered up, and left to steam until morning, when it is fed warm. I change the ingredients occasionally, leaving out one and adding middlings or mashed up vegetables. I never give my hens all they will eat of this mash — only enough to satisfy the cravings of hunger. Cracked corn (because it is small and hard to find), wheat and oats mixed together are scattered in the litter, and the hens are compelled to scratch to find it. At noon I feed cabbage every day. At night I feed a scratch feed of whole corn, wheat, and oats, and all they can possibly eat; if the weather is very cold, more corn than oats; if the weather is extremely cold, frequently all corn. Surely there is nothing very difficult or mysterious about this mode of feeding, and I get eggs all winter.

"My flock is supplied with fresh water once every day, and never until about nine or ten o'clock. I consider this the best hour, because the hens are then warmed up and ready to drink. Giving fowls water at seven o'clock in the winter mornings, is like giving a man ice water after he has

passed a not too warm night. It chills his whole system, and it requires all the blood in his body to take off the chill. It has the same effect upon the fowls, and when they are thus chilled they will not lay until they are warmed up."

THE AUTHOR'S METHOD.

The method which after several years experience and experiment I adopted, as well suited to closely yarded fowls in a dry climate (Colorado) where at that time many believed egg farming could not be carried on successfully because of the difficulties of the climate and altitude, was:— Morning,— mash; by measure 2 parts finely cut alfalfa, 2 parts heavy bran (bran and middlings), 1 part corn meal; cook alfalfa in as much water as will make the quantity of mash needed of proper consistency, (about the proportion of 5 gals. water to each peck of cut hay); when boiling stir in corn meal, or corn chop, making a thick mush; add the bran, mixing thoroughly, to make a stiff crumbly dough. Feed either hot or cold, all they will eat clean in ten to fifteen minutes. If other green food is abundant the hay may be omitted,— in which case not so much mash should be fed, and the green food given an hour or two after the mash. With the proportion of nicely cured alfalfa specified fowls will not suffer for green food if they get no other, but when a variety of fresh

green food is obtainable it should always be used. Noon,—a light feed of oats or millet, dry or steamed; or of wheat, about one-half pint to every ten hens. Noon feed omitted on Sundays. Evening,—at four or five o'clock, wheat—about a pint to every ten hens, in litter; at dusk a little whole corn to fowls that were waiting for it or would come from the roost to get it. Two or three times a week the hens got all the cut bone or beef liver they would eat about the middle of the afternoon, and on these days the evening feed was slightly reduced. The mash was cooked in a large set-kettle and mixed with a long handled shovel. When fed in the morning it was fed hot. During warm summer weather when the fowls preferred to exercise out in the yards, (which were littered and in which the grain was usually fed), in the mornings and evenings, and because of the heat would go hungry rather than exert themselves for food through the heat of the day, the mash was fed at noon, and was then considerably cooled though not cold.

HOT OR COLD MASHES.

Within a few years a great deal has been said in poultry papers of the evil of feeding hot mashes. There have been some who have asserted that hot mashes were responsible for many cases of colds and roup, and that the hot mash was unsafe. As

I used hot mashes for years with very little colds and roup in any flock, (none at all that would be traced to this cause), and as many others are regularly feeding a hot mash without the least reason to suppose it causes trouble of any kind, I must dissent from that opinion. At the same time I would say that if hens are fed so much of a hot mash that they cannot eat anything more, and will not look for grain in the scratching floor, or take any exercise until several hours have passed, there may be more danger of their catching cold if the mash feed is hot than if it is merely warm, or cool. But, hot or cold, a mash should not be fed in this way. Give the hens "all they will eat up clean and quick" of a properly compounded mash, and, if in good condition, they will promptly begin scratching or foraging, for the quantity of a mash of right consistency which is eaten up quickly is not apt to produce satiety.

My reason for feeding the mash hot was that my hens seem to prefer it that way, a preference which to anyone who likes his meals smoking hot seems perfectly natural. I never saw any reason to suppose that they laid better for the mash being hot, except perhaps in extremely cold weather. They were certainly in no way the worse for it. After removing to Massachusetts I fed my small flock of hens thus, both summer and winter :—

Morning,— mashes, alternating, one day table scraps and slops mixed cold with corn meal, shorts and bran equal parts; next day, 2 parts corn meal, 1 part fine shorts, 3 parts bran, a little meat meal; make a thin mush of the corn meal, and pour while at boiling temperature over the other ingredients previously mixed dry in a pail; stir thoroughly to a stiff, almost crumbly dough; feed when cold. (A mash made in this way needs time to cook by its own heat). Noon, in winter, — vegetables or occasionally steamed clover. The steamed clover was only given by way of variety. The fowls would not eat much of it, but it helped keep them occupied. Afternoon feed,— about three o'clock, cracked corn in heavy litter, 1 qt. to twelve hens two days; third day same amount of wheat. On cold evenings as much whole corn as would be eaten greedily. In summer these hens had good grass yards, and could get all the grass needed, and many worms and bugs. Feeding by this system I found nothing in either condition or product of the hens different from the results of feeding the other ration with the hot mash.

THE FEEDER MUST USE JUDGMENT.

Now in using any of these rations the beginner must understand that the proportions of the various articles given are for stuff of average good quality.

If by chance an expert feeder buys a quantity of grain or mill stuff of inferior or superior quality, and the difference is great enough to sensibly affect the feeding value of the ration, he allows for this in mixing the mash or in deciding the proportions of the different grains to be used. The foods which are most likely to vary from the average standard of quality so much that special lots of them may make trouble for a beginner are the commercial mixtures of ground grains, the prepared meat foods, and such grains as oats and millet. The commercial mixtures, though supposed to be uniform in quality, and perhaps generally so, are occasionally far off the average standard. An experienced user of such articles will see this when he mixes the food even if he failed to do so when purchasing it; but a novice cannot be expected to do so, and frequently strikes a snag in consequence. As experience comes, however, difficulties of this kind diminish. Articles of the class just mentioned are I think more likely, when not of usual quality, to be below rather than above the standard. With meat meals and meat preparations on the other hand the reverse is sometimes the case. A number of instances came to my notice the past winter where persons feeding standard meat preparations according to manufacturers' instructions based on the guaranteed

quality of the articles, soon found that their fowls showed all the symptoms of being overfed with meat. They were advised to reduce the quantity of meat until conditions were right. They did so, and results showed that the excess of meat in the ration had caused the trouble. The usual faults with oats and millet are that the grains are not well filled out, the kernel being sometimes almost entirely wanting, and the hull prevents this being noticed. These grains should always be well sampled before buying. Barley is also sometimes deficient in the same way, but not so often as the others. Again and again I have seen people feeding millet in which there was hardly one sound well filled grain in a dozen, and sometimes it is almost impossible to get oats worth feeding.

ADJUSTING THE RATION.

Notice that in all the rations given the bulk of the ration is of grain—whole and ground. If in feeding one will give about the average quantity of mash and grain per fowl — if anything different, giving a little less rather than more; and will then give regularly and abundantly all the meat and green stuff the hens want, he will have little trouble in keeping his hens in good condition and laying well. The only difficulty will be that in extremely hot weather the hens, if permitted to do so, might eat so much green stuff and so little grain that the

egg yield would be very much reduced. This can be avoided when the fowls are yarded by giving the green food only after the hens have had quite a substantial meal of grain. When the hens are on range and are not laying well in summer, it is a good idea to keep them up in the morning until they have eaten a fair breakfast of grain, then let them eat what they choose the remainder of the day, giving again what they will eat before going to roost. If their range is good they may not want anything, but they should have it if they need it.

GOOD MASHES ARE BULKY.

Most good mashes are bulky—the bulk being made by clover, or vegetables or bran, either separately or together; or by the swelling which takes place in thorough cooking. A mash that is bulky with hay or vegetables can be fed much more freely than one which owes its bulk mostly to the condition of the grain in it, and a well cooked mash can be fed much more liberally than a partly cooked one or one that is merely wet.

GOOD RATIONS PROVIDE VARIETY.

Observe that all the rations given provide a good variety of food. Variety in feeding is necessary if you have continuous good results. Fowls which are limited to a very few articles of diet are much more likely to lose appetite, and more susceptible

to disease than those which are furnished an ample variety. It is not necessary that the bill of fare should be elaborate, but is necessary that it should not be monotonous.

GRIT ESSENTIAL.

A good supply of clean, sharp grit should be always accessible to the hens. Sometimes a loss of appetite is due to lack of grit. I have seen hens that refused to eat, suddenly recover their appetites when furnished with grit. They would pick up a few pieces of grit and then begin to eat food which perhaps ten minutes before they had refused. Your hens may do without grit for a long time without showing the effects of it, but the digestive system will be slowly and surely breaking down, as you will find out when too late to remedy matters.

ABOUT EXERCISE.

Exercise and good feeding are inseparable. In a state of nature fowls have to forage vigorously for about all the food they get. We may suppose that occasionally they find a full meal quickly and easily, but most of what they get to eat comes little by little. So in the semi-natural conditions which are found on many farms the fowls forage for most of what they get, and like the wild fowls, though not to the same extent, their productiveness is limited to a short season. On the farm

there is rarely such varied abundance of food easily accessible that the fowls suffer for lack of exercise. With well fed hens, as kept by poultry keepers who try to feed for good results, the case is different. Good feeding tends to make fowls sluggish. The proper digestion and assimilation of food depend on the hens taking enough exercise to keep them in good physical condition. Experience has shown that this must be, in part at least, compulsory. The ingenuity of the poultry keeper solves this question by giving the hens their whole grain buried in litter so that to get it they must scratch for it. Those who have adopted this method (most progressive poultry keepers are of the number) have sometimes made the mistake of compelling the fowls to take too much exercise. All that is necessary is enough to keep the digestion sound.

HOW MUCH TO FEED.

The question,—How much to feed, is one that bothers most novices. It is not an easy question to answer in words. As has been said, the poultryman must learn to feed according to appetite, condition and results, and this he must learn by experience. However, it will help a novice to know just how much some one else has fed to get certain good results. He can know by comparing his work with these whether or not he is feeding about the usual quantity. If he is feeding much

less and getting good results he needs to look to the condition of his hens to see that they are not running down in flesh as a result of short rations and good laying. A great deal of irregular laying is traceable to this cause. If he is feeding light and the hens are not laying, or not laying well the difference between what he feeds and what others feed suggests the necessary amount of increase in his ration. If he is feeding much more than the usual amount he needs to look to see where he is wasting food — what becomes of it — for it is not likely that his hens eat it all. Each one, in feeding poultry, must rely finally upon his own judgment, but the statements of amounts fed by others are good for rough measures for the inexperienced. In giving this information I will give also other details of the method of each person whose work is quoted, and these statements taken with the rations already given will furnish a variety of thoroughly tested rations from which the beginner should select that which seems best suited to his circumstances and follow it as closely as he can. It will be found better at first to follow one man closely than to attempt to combine the methods of two or more. The important thing for the novice is first to acquire skill in using a good method of feeding —having become skillful with one he may, if it is advisable, vary it, but at the start he had better follow his model.

MR. M. K. BOYER'S METHOD.

First I give a ration for a dozen medium sized fowls, recommended by Mr. M. K. Boyer, editor of *A Few Hens:*—

Dump all kitchen scraps into an old pot, and cook each evening; salt when cooking. In the morning heat up again. Scald one pint bran, one pint equal parts ground oats and corn meal; mix with the scraps. Twice a week add a little Sheridan's Condition Powder or charcoal and sulphur. Feed two quarts (less rather than more) to twelve hens. At noon feed one pint of wheat or oats in litter, at night one quart of wheat, or oats, or (in winter) cracked corn in litter, feeding the grains in regular rotation.

MR. S. B. PATTON'S METHOD.

Mr. S. B. Patton of Newcastle, Pa., a member of the Farm-Poultry experiment club in 1898, fed a pen of twelve Silver Wyandottes as follows:— Morning, one quart of wheat in litter. Noon, green food, clover, mangels or cabbage. Evening, mash, eight parts corn meal, eight parts fine bran, four parts buckwheat middlings, three parts meat meal, two parts oil meal, a little salt; all mixed in warm water and fed crumbly, all they will eat clean.

In these two rations the quart of grain fed in litter is not all eaten at one time. Mr. Boyer's hens

fed a quart of grain at night would eat about two-thirds or three-fourths of it, and what little was left would keep them busy at intervals through the next morning. The pint of grain fed at noon would give the hens a very light feed at the time, and leave something well concealed for those which were hungry enough to work for it through the afternoon. When Mr. Patton gave his hens a quart of grain in the morning that was enough to give them a breakfast without too much time being taken to get it, and leave something in the litter to search for through the day.

It is understood also that the quantities given are the usual quantities, which would be slightly increased or decreased if in the judgment of the feeder that was necessary.

MR. OBE LASH'S METHOD.

Mr. Obe Lash of Vermont, Ill., used this ration for pens of a male and twelve hens, Plymouth Rocks, in confinement:—

Morning and noon,—for pullets, one pint wheat in litter; for hens ¾ pint. Evening,—mash, four parts beans, two parts shorts, three parts ground oats, one part ground corn, one-third the whole cut clover; every third day one-quarter the whole green cut bone, two tablespoonsful pulverized charcoal to a bucket of feed every third day; wet with hot water, and when cool feed until the crops are about two-thirds full.

A member of the F.-P. experiment club whose 25 Barred Plymouth Rocks averaged fifteen dozen eggs each in 1898, fed this ration :—

Morning,— Mash, (2½ quarts), made of 1 part corn meal, 3 parts bran, scalded; cut bone or meat scraps mixed with the mash three times a week, other days vegetables; Sheridan's Condition Powder in the mash once a week; cabbages, beets, and other vegetables freely. Noon,— 1 quart wheat or oats alternately until the middle of May, then oats only for the rest of the year. Evening,— About 2 quarts of corn daily. During the summer the hens had free range.

GENERAL REMARKS ON CARE OF LAYING HENS.

Having given the foregoing feeding formulas and general hints, we take up a few points specially relating to the diet and care of laying stock at different seasons. In the early fall both pullets and hens should be well fed — not stinted at all. At this time there is little danger of overfeeding, if the stock is healthy and conditions for exercise right. Pullets can stand pretty high feeding, because few are full grown and fewer still full feathered. Besides, in the early part of the laying period though we say the pullet has reached laying maturity, she is not fully developed physically, and is at the same time making growth and producing eggs. She can, therefore, use a heavy ration.

The hens kept over are in their molt, and can stand about as heavy feeding as pullets. Hens molt best on a ration that would be likely to make them overfat if in good condition and full feather. They keep in better condition during the molt, and lay better afterwards.

I have always made it a practice to keep my poultry houses open so much as possible both day and night, because my experience has taught me that abundance of fresh air is one of the best preventives of disease, and that fowls do much better when hardened to a reasonable degree of cold, heating foods being fed ta keep up the necessary warmth,—than when shut up in warm houses and fed on a less heating diet. However, in hardening up fowls in this way in the fall one must avoid exposing them to a degree of cold that would injure them by checking development. The care of laying stock at this season calls for good judgment. When severe storms or frosts come the hens must be properly protected from them. Even a single exposure of a few hours may delay laying as effectively as exposure to a week of bad weather. The point is that the hens must be made comfortable, if need be, at short notice. The fall may pass without any rough weather, the days uniformly fine and days and nights gradually growing cooler until winter is on in earnest and the hens so well seasoned that it hardly seems necessary to shut

their houses at all. Another season there may be frequent sharp and sudden changes, and the fowls should be provided for accordingly. In extreme cases it pays even to go to the trouble of driving them into the houses in advance of a cold wave, that they may not be chilled by remaining out as usual until they become thoroughly uncomfortable. These severe and sudden changes are responsible for many disappointments to those who have worked all spring and summer for early eggs. If the fowls are driven in and the house closed up, the warm air inside cools off gradually and thus the effect of the change on the hens is discounted. But there must be no coddling—no shutting up fowls for slight changes, no keeping them in when robust fowls should be comfortable outside. On sharp frosty mornings the fowls may be kept in until they have had a meal, but should never be confined late unless there is frost enough to nip their combs. There is nothing more objectionable in the management of laying hens than shutting them up close in only ordinary cold weather. It makes them soft, and after a time they are more susceptible to moderate than rugged fowls to severe changes.

It is a good plan to cull out all birds easily affected by bad weather. Do not nurse such along in the hope that they will eventually be all right. Their room is worth more than their company.

Even when the snow is on the ground get the hens out for a little while every day. Clear away a place for them to sun themselves and take the air. Don't be over-careful to prevent them walking on and eating snow. It is often said that either of these things will stop laying. Healthy fowls which have dry comfortable quarters to go to whenever they feel so disposed can be allowed to go and come as they choose. Fowls that have a supply of water will not eat snow when it will hurt them.

As the days grow short it becomes difficult to get in three meals a day, with intervals between long enough to keep the fowls in good appetite. My fowls always seemed to need to be up and about for a little while before they would eat their breakfast in a business-like way. If well fed at night, it was some little time after sunrise, even in the short winter days before they would eat heartily. When the mash is fed in the morning, a good method for the short days is to give all they will eat clean of a clover, alfalfa, or vegetable mash, and scatter millet, or other small grain, where they can get it by scratching for it at any time through the day. Then about three o'clock give a good feed in litter, and a little whole corn at dusk to help out any that may have failed to get their share. When the mash is fed in the evening it seems easier to regulate the three meals in short days.

Whether he gives two meals or three the poultry keeper should learn to so regulate the quantity given at each meal, that the hens will be ready and waiting for the next. If this is not done hens soon go "off their feed," though not overfed. This is usually due to allowing them to get too hungry before the evening meal, making them so greedy that they quickly gobble up more than they can comfortably digest. By being observant and careful one soon acquires the knack of feeding about right for quantity, and finds it more simple than the amount of explanation needed to make it clear to an inexperienced person would indicate.

Extreme cold weather is no bar to good laying if the hens come to it without having been suddenly checked. In such weather hens need a great deal of corn and also of animal food. The house, too, must be closed tight at night, and except during the warmer hours of the day. Then the hens must not be allowed to chill themselves with icy water or ice cold grain fed in troughs or on the bare ground. It is of little use to warm grain that is to be fed in litter, for most of it is cold before the hens find it, and at any rate they cannot eat it fast enough to chill them much.

When it is so cold that the poultry house must be closed during all but six or seven of the twenty-four hours, ventilation needs close attention. In

such weather the house quickly becomes very damp unless well ventilated, so that it must be kept open as much as possible to allow the circulation of air to dry the walls and ceiling. A good rule for ventilation in cold weather is, to open the house as much as can be done, and still leave it comfortable for the person working in it.

In warm winter weather great caution should be observed in feeding. Use corn sparingly, increase the proportion of hay or vegetables and bran in the mash. As the warm spell passes, go back to the regular winter diet.

In the spring hens need and will stand heavy feeding. While it is not entirely true that the more a hen eats the more she will lay, it is true that when the hen is laying heaviest she eats heartiest. Most hens lay very heavily in the spring months, and there is a tendency toward loss of flesh on this account unless the hens are particularly well fed. Novices rarely discover anything wrong until the hen is out of condition and stops laying. By watching the condition of the hens the trouble can be avoided.

With the first hot days of summer, hens that have gone out of condition and hens of stock not accustomed to continuous laying are apt to quit. Nearly all hens show a disposition to let up on egg production in very warm weather, but judicious

care and feeding (see page 30) will keep those that are in condition, and have the staying qualities, laying fairly well all through the hot months, extra good laying is not to be expected.

There are always some hens, sometimes quite a large proportion of the stock, which cannot be kept laying through the summer when handled in the usual way. These should be culled out, penned together and fed for fattening. On this treatment many of them may begin to lay in a short time and lay well for a few weeks. When they stop they should be marketed, and any that do not lay should be sold as soon as fat enough. It is better to handle them in this way than to indiscriminately sell all as soon as the general egg yield goes down, or hold all until time for the pullets to begin laying.

WHAT IS A GOOD EGG YIELD?

In these days when there is so much loose talk about 200-egg hens the beginner who is getting a much more moderate egg yield is often inclined to feel that results with him are far from satisfactory. For the information and consolation of such, I would say that these extraordinary egg yields—some of which are probably not authentic — are rare, and that as a matter of fact, flocks which average ten to twelve dozen eggs per hen per year are doing very good work, and if cost

of food and labor are kept within reasonable limits, should give a very satisfactory profit. Indeed, did space permit, I could furnish data showing how a number of poultry keepers in different parts of this country are making good profits on hens which average less than ten dozen eggs each per year. Of course everyone wants to do as much better than this as he can, for generally speaking the larger the egg yield the greater the profit; but it is a very serious mistake for one whose hens are doing fairly well by a well tried method to become dissatisfied and begin trying every new method of feeding or handling he hears of in an effort to rival the chance phenomenal records which are published from time to time.