

calf born into this world with plenty of vitality, it is not much trouble to develop the future animal from it. The main thing is to keep it growing thriftily, and thriving at all times.

There are a great many ways of rearing a calf, and any way is good enough that will keep the animal growing well. Nothing is better than skim milk for dairy calves, but we have found other ways just as good. Now, for instance, when we are selling milk for city use, we have no skim milk. We have just as good calves, though, and we feed in this way: The calf for the first two or three weeks is given its mother's milk fresh, then, as the calf gets older than three weeks and is doing well, we add a little warm water to the milk each day, and gradually reduce the quantity given of milk, until, at about six weeks old, the calf is getting about two quarts of milk and two quarts of water, and as it gets older we increase the water, so that it will have sufficient drink to do it. We find that our calves so fed take to eating hay, a little silage and bran, at a very early age (3 or 4 weeks), and they gradually work up upon this feed until they eat quite a bit of it. We find, though, it is good to give the calves a little milk, even if only a quart or two, in their water for six or seven months, as it keeps them thriving better than anything else will. Very often the mistake is made of giving the calf too much milk when young, and shutting it off at too early an age altogether. We find it of great advantage in developing our heifers to keep them growing at all times, from calves to maturity, and I can especially recommend rape as great feed for yearlings and young cattle, also dry cows, and I plan to have some of this in the fall when other pasture is getting somewhat dry. We have a good many heifers and cows fresh in the fall or early winter, and I find, by putting them on a good feed of rape and keeping them in first-class condition—having them, in fact, fat when they come into the stable—they do better all winter. Heifers or cows that calve towards spring are much better and likely to do better when fed on a succulent ration like ensilage, roots, etc.

GEO. RICE.

POULTRY.

How She Gets Winter Eggs.

To the Editor "The Farmer's Advocate":

Three years ago I watched "The Farmer's Advocate" anxiously for assistance in making my hens lay, and have read with much interest and not a little profit, every article on the management of poultry published in the paper since. This winter, I am glad to say, my hens are doing their duty, and I am sure are costing less to keep than they have for years. Therefore, I thought my method of management might be interesting to some readers of your poultry column who are trying, like myself, to get the best results from a few hens. I had about seventy very nice, pure-bred Barred Plymouth Rock pullets hatched in May and early part of June. After the fall wheat was cut they got very little food besides what they gleaned on the stubble until late in October. On Thanksgiving day I put them in winter quarters—a henhouse about ten by sixteen feet, built against the south end of the horse stable, of double boards, with concrete between, with gravel floor, and two south windows. Last year I put in double windows, which I find a great improvement—just two sashes that were lying by, and put in by a handy man about the farm. The henhouse was built, in the first place, by one of the farm hands who had a turn for building. I had one window fixed so that I could slide both sashes back, either from the inside or the outside. This I find very convenient, as I kept the window open and put in a wire screen most of the time when I had such a great number of fowls in my small henhouse. I kept them shut in for three or four weeks, as I knew they would return to their old roosting-places. I was rather afraid of illness, as they were very crowded; but they were healthy and happy. I fed liberally with oats and barley, and mangels or turnips. I frequently gave them a sheaf of oats to keep them busy. Often I put a sheaf of oats in the henhouse late in the evening, that they might be kept busy until I was able to attend to them in the morning.

Early in December I reduced my flock considerably. On the tenth of December they began to lay. At present I have thirty-six hens, and am getting from fifteen to seventeen eggs a day. In December I began feeding a warm mash of nearly a pail of red clover chaff, with about half a gallon of ground oats and barley, a small tablespoonful of salt, and sometimes a teaspoonful of red pepper mixed in the mash. This I give about ten o'clock in the morning. Frequently I scald the mash with boiling skim milk. I keep a pail with fresh water for them all the time. On cold days I give them hot water. They have a box of fine gravel and a dust-bath in the henhouse. Every day that is not intensely cold they run out in the stable yard, where there are no animals to

trouble them, and I throw them out a few oats to keep them scratching while they are in the open air. They have had two or three cooked livers and a little raw beef. When the weather is very cold I give a little buckwheat once a day. In former years we have fed our hens wheat, chiefly, but this winter they have had no wheat. Last year I intended having pullets hatched in March, but could not get eggs for hatching. This year I have plenty of eggs from my own hens, and hope to set my incubator about the first of March. I purpose setting two hens this week, just to test the fertility of the eggs.

York Co., Ont.

WRINKLES.

Management of Incubators.

There are 130 incubator manufacturers in the United States, any of which sent out last year from 2,000 to 10,000 machines. This gives some idea of the number of incubators in use across the line, and a fair indication of what are used in Canada. Go where you will throughout the Dominion and you will generally find an incubator in the neighborhood. The results have been varied, but for the encouragement of those who have not had the success they anticipated, I would say, don't be discouraged. If your machine is of a good, reliable make, the fault may not be in the incubator. Profit by your failures of last season. No machine, however perfect, can hatch a large percentage of strong, vigorous chicks from eggs that have been produced by parent stock lacking in vigor. Be sure your breeding stock is perfectly healthy, and of good strong constitution. So much depends upon the vigor of the laying stock that without it failure must inevitably follow.

Selection of Eggs.—In selecting eggs for hatching, it is well to have them as near the one age as possible, and the fresher the better. Eggs with thin shells, or deformities of any kind, should be discarded, as also eggs of over or under size. In fact, no egg should be expected to produce a chick that was not in itself normal; hence, put into the incubator eggs of good shell, uniform in size and shape.

Eggs held for the incubator may be kept at a temperature of 50 to 60 degrees, and it is not advisable to turn them.

Location.—Probably the best place to locate an incubator is a well-ventilated basement, where the side opens out level with the ground. For one or two machines, any well-ventilated room where a fairly even temperature can be maintained will answer. Where many machines are operated in the one room, the question of ventilation becomes a more serious one. Better results will be maintained if the room can be kept at a fairly even temperature.

The Incubator.—The two systems of supplying heat in most of the incubators is by the "Diffusion" and "Radiation" methods. A diffusion machine is one where the warm air is forced or diffused into the egg-chamber, such as the Cyphers, Model, etc. The radiation machine is one where the egg-chamber is heated by radiation from a heated surface, such as Prairie State, Chatham, and like machines.

An incubator should always be stored in a dry room, and should be thoroughly cleaned before storing. In operating, follow the directions of the manufacturers minutely, and do not deviate until you are sure you can improve. If you do change, and fail to get the anticipated success, don't blame the machine. Incubators are made to run under certain conditions. When the machine is put together, see that all the parts are working freely. Set it level, and operate several days before the eggs are put in. It is well to have a spare thermometer or two, in case of accident, and it is also advisable to keep several in the machine, in order to get thoroughly acquainted with the egg-chamber. Incubators do not always heat evenly, and if not it is well to know, so as to be able to guard against disaster. In some of the machines it is necessary to readjust the regulator when the eggs are introduced, but, as a rule, if it works before, it will work after the machine is filled, without additional adjustment.

The first week of incubation is the most important. Extremes of temperature during that period are injurious; extremes during later incubation do not materially affect the hatch.

The testing should be done at least twice during the hatch; cooling after the third or fourth day. The practice of cooling so many minutes is not a good rule—rooms differ so much in temperature. Place the eggs on a table, and cool until they feel cool in the hands, and when putting in change the sides and ends alternately.

During the latter part of the period of incubation the temperature may be gradually increased one or two degrees, until, when the eggs pip, the temperature reads 104 or 105.

Number of Hatches.—As a rule, the early hatches produce the best chicks. Chicks hatched during the summer months are not so thrifty, and are more subject to diseases. Aim to start early enough that your third and last hatch is off by the last of May.

F. C. ELFORD.

Department Agriculture, Ottawa.

Simple Remedy for Roup.

To the Editor "The Farmer's Advocate":

I see a question asked in the last issue of "The Farmer's Advocate," "How to cure roup." I will give a simple remedy, which we have used with perfect success for the last fifteen years. When we notice one of the fowls attacked with the disease, we catch it and fill its mouth with sulphur. We have never found it necessary to repeat the dose, and to protect the rest we place dry bran and sulphur in a dish on the floor, where they can help themselves. It will prevent as well as cure the disease.

A. DOHERTY.

[Note.—There are many forms of roup, and not all would yield to the above treatment, though it would be all right for cases where the throat was the part affected. The genuine diphtheritic roup, however, should not be treated, but the bird destroyed.—Ed.]

APIARY.

Out Apiaries.

Paper by Denis Nolan, before the Ontario Beekeepers' Association.

In dealing with this question, it might be considered by a great many beekeepers as one in which they had little interest, as such a small percentage of those who keep bees ever manage out yards. However, I think if we look a little closer into the matter we will find that it is of more or less importance in beekeeping.

Only in rare instances do we find persons who are fortunate enough to have a locality, a strain of bees, or some superior system of management, which enables them to keep a sufficient number of colonies in one yard to allow them to be classed as specialists in beekeeping or large producers of honey. Beekeepers who are almost solely depending on their honey crop as their source of income, are desirous that their crop should be of such proportions as to furnish them ample funds for a comfortable living, find that under ordinary conditions such a quantity of honey cannot be produced in one apiary alone. By distributing our colonies in yards away from our home yard, we are enabled to allow our bees a much larger area to gather nectar from without having to travel great distances. By doing this we can keep a large number of colonies, devote all our time and study to this one work, be a specialist in this particular line, always looking for better things in management, production and marketing of honey, etc. We are accomplishing something for the beekeeping world which cannot be overlooked, besides turning into a sole occupation a profitable and pleasant work, which, in a great many instances, is regarded as a mere side line.

From what I can learn from observation and otherwise, the fewer number of colonies kept in a given area, the better results are secured. Taking this as a basis, we will have to determine to our own satisfaction what is going to be the limit of the number of colonies kept in one yard, according to our own management and locality. Speaking on my own experience, I would suggest one hundred good colonies in the spring, which might be increased to 150 during the season. To increase these numbers would mean that you reduce the yield per colony, increase the desire to swarm, and have a larger amount of bees and brood to sustain on the nectar of the field covered. To reduce the number means you reduce the income on some investments, viz., cost of establishing yard, attendance, etc.

In establishing out apiaries, the first consideration should be locality. The area to be covered by the bees should furnish ample forage without traversing territory covered by bees from other yards, which would place it about three miles from any other large yard. See that the territory has some honey and pollen yielding trees and shrubs for spring stimulating, as well as full quota of basswood, clover, and perhaps a little buckwheat. A locality can best be judged after a practical test of two seasons, and sometimes a half mile materially affects the yielding secured.

Next locate the site for the yard, which is an all-important matter. If possible, choose a sheltered spot, if bees are to be wintered there outdoors, and have it shady if you desire trees. I prefer cedars, by standing them in tiles set in the ground; you will see on your arrival, in an instant, if any swarms have clustered. One of our pasture field, about fifteen rods from the highmost satisfactory sites was in the center of a way.

A good tight house, bee-proof and dry, is a necessity, of course, but as out apiaries are not permanent institutions, we can do very well with any means of shelter for our supers, empty hives, extracting outfit, etc., that sheds rain and storm. When the season arrives, if the building does not exclude robbers, a small cotton tent can be made to extract in, for undoubtedly you will have considerable extracting to do after the main honey flow is over if you are an out-yard man. A good advantage the cotton tent has is that it gets very warm in the rays of the sun, and honey