

THE MAGAZINE GUARDIAN For Parents, Teachers, Pupils, Dairymen, Farmers, Horsemen

TO THE FARMER

Farmers and others interested are invited to contribute to The Farm, The Dairy, The Turf, and Good Roads departments of the Guardian...

Contributors are asked to have their articles at this office early each week, as only a short emergency item can be handled as late as one p. m. Wednesday.

THE SCHOOL AND THE HOME

Contributors for this department should be addressed to President Teacher's Association, Guardian's School and Home, P. O. Box 188 Charlottetown.

TELLING THE TIME.

"Tick, tock, tick, tock," says the big clock, Tick, tock, tick, tock, almost eight, Hurry, children, get your school books.

"Tick, tock, tick, tock," says the big clock, Tick, tock, tick, tock, almost three; Put your books away my children, Run off home right merrily.

"Here is where my geometry can be put to practical use," said Miss Russell, as she deftly drew a circle sixteen inches in diameter on a piece of white Bristol board...

Upon the circle, in very faint dotted lines, she drew the diameter (vertical and horizontal). About half an inch inside the circle, she drew another circle. At the top of the vertical diameter, with a brush dipped in ink, she made the Roman numeral XII...

The space between the numbers all around the dial was divided on the circle margin into five equal parts (thus making the minute divisions.) A long hand and a short hand, cut from cardboard and inked black, were secured to the middle of the dial by means of a metal fastener...

She taught them the Roman numerals, and the meaning of the minute space—what "half" and "quarter" meant, and illustrated it all on the big dial. She taught them to count by fives, and how to move the short hand and the long minute hand.

Of course, this took time, but the training in number work was good, and after a while when the children understood about it, as a little recreation and exercise, Miss Russell would call up one of the minute divisions.

This is a good and practical exercise, and can be worked out with good results even in the first grade—Primary Education.

Are there very many boys and girls who would hop three blocks to school on an injured leg rather than be absent?

That is what a certain dog did. Hilio is black and white and belongs to Mrs. M. M. Burris of Pasadena, Cal. When Hilio's hips were badly hurt by a speeding automobile he walked to school with all his weight directed to his fore feet; and he went not to a dog training school and through fear of his master, but to the Lamanda Park School for boys and girls.

He enrolled in this school just eleven years ago, with the Burris boys and girls. Punctuality and cheerfulness are his twin mottoes. Every morning with cheerful barking he led the children to school, barking loudly in protest if they lingered on the way, and remaining quietly with them all day. When the children passed on to higher grades, Hilio stayed in his old school.

Every day he appears promptly at the schoolhouse, passing from room to room in order to survey carefully pupils and teachers. This done, he inspects the grounds. At noon he sometimes deigns to be fed by the children, but generally he goes home for his lunch. He is always prompt in returning, however, to the afternoon session.

When going home time comes and the bell rings, Hilio helps marshal the children into the line of march, barking furiously at the child who is not in correct position. He takes his place at the head of the line and leads the boys and girls from the schoolroom, through the corridors and out into the playgrounds.

IN THE KITCHEN.

Pickles may be kept from becoming mouldy by laying the bag of mustard on the top of the pickle-pot.

Water in which potatoes have been boiled is the best thing with which to sponge and revive a milk dress.

A very little glycerine smeared around the glass stoppers of bottles will keep them from sticking for a long time.

Knives can be cleaned in half the usual time if the knife-board be thoroughly warmed in front of the fire before being used.

To render pork sausages more digestible, thoroughly prick the sausages and plunge into boiling water for five minutes. Then fry in the usual way.

Cayenne pepper is excellent to rid cupboards of mice. The floor should be gone over carefully and each hole stopped up with a piece of rag dipped in water and then in cayenne pepper.

The best way to warm up a joint is to wrap it in thickly greased paper, and keep it covered while in the oven.

By having it covered thus the steam will prevent the meat from becoming hard and dry, and the joint will get hot through in less time.

Soda should be thoroughly dissolved in the washing water before the clothes are put in. Never allow it to lie a-bottle long, as this sometimes causes ironmould. Soda should never be added to water in which woolen things are being washed, as it causes them to shrink.

Flax may be preserved for a couple of days in a very simple yet safe way. Boil together three quarts of water and pint of vinegar. When just on the boil put in the fish and scald it, but not for more than two minutes.

When several saucers are on the fire at once place a large clean white cloth over the top of the stove, and ridge, custard, stew, or anything requiring constant stirring. The marble will roll about with the boiling, and so automatically keep the liquid constantly stirring. There will then be no chance of burning, and the fatigue of constant bending over a stove will be avoided.

WHAT O'CLOCK ARE YOU?

(By Francis Kirkland)

It was John's turn to think of a new game to play, for the old games were worn out. So John stopped his sister Emily on the stairs, and asked, "What o'clock am I?"

Emily looked at her brother. His lips were drawn together for whistling, but no sound came. His left arm was bent, as if he were carrying a burden.

Emily clapped her hands. "You are nine o'clock, schooltime," she said. "Right!" cried John. "Now you try it."

Emily thought for a moment; then she went to the door and looked up and down the street. She came back and shook her head. After a moment she ran to the door again. When she closed the door she pretended to hold something in her hand.

"Oh," said John, "you were looking for the postman. You are eleven o'clock."

"That is right," Emily answered. "Let's go and tell Marion." Marion laughed. "Now you both guess what time I am."

She lay down on the floor and put one arm under her head; then she started up and rubbed her eyes. Afterwards she lay down again.

"Seven o'clock!" cried Emily. "Marion never likes to get up." "And so it went, until every hour of the day had been acted in many ways. —Youth's Companion.

PRESERVE FRUIT.

If the supply of fruit is greater than the family needs, it may be made a source of income by sending the fresh fruit to the market. If there is one near enough, or by preserving, canning, and making jelly for sale.

To make such a market a success the fruit must be made first class. There is magic in the word "Home-made," when the product appeals to the eye and the palate; but many careless and incompetent people have found to their sorrow that this word has not magic enough to float inferior goods on the market.

As a rule large canning and preserving establishments are clean and have the best appliances, and they employ chemists and skilled labor. The home products must be very good to compete with the attractive goods that are sent out from such establishments.

TO SECURE A MARKET.

Get the names of several first-class grocers in some of the large towns. Write to them asking if they would be willing to try a sample of your goods. If the answer is favorable, send samples of the articles you wish to sell. In the box with the samples include a list of the articles sent and the price. Write your name and address clearly. Mail a note and a duplicate list at the time you send the box.

THE PRICE IMPORTANT.

Fixing the price of the goods is important. Make it high enough to cover all expenses and give you a fair return for your labor. The expenses will be the fruit, sugar, fuel, cans, glasses, boxes, packing, wear and tear of utensils, etc. A commission will probably be 20 per cent. of the selling price. It may be that a merchant will find that your prices are too high or too low for his trade, or he may wish to purchase the goods outright. In any case it is essential that you estimate the value that you place on your labor. You will then be in a position to decide if the prices offered will compensate you for the labor and expense. Do not be tempted, for the sake of a little money, to deprive your family of the fruit necessary to health and pleasure.

POULTRY

HATCHING, BROODING AND REARING CHICKENS

(By T. A. Benson, Dominion Poultry Representative.)

We should prepare at once for the all important work of replenishing the farm flock and lay the foundation for a satisfactory supply of eggs next winter.

It should be recognized that this preparation must be taken in hand in earnest. If we expect to reap any reward as a result of our efforts, poultry raising is now one of the most important branches of farming and must be recognized as such.

When we undertake the hatching and rearing of chickens on the farm, what we should really be endeavoring to acquire, is the most efficient egg machine possible, a machine that is capable of turning out the largest possible number of eggs of the best quality during the season of highest prices; and this under such conditions as our best efforts, opportunities, and surroundings will permit.

There is also a considerable profit in raising poultry. It is always wise to provide for this department also. This brings us down to the question of breed, and it is perhaps easier to successfully manage only one breed, under ordinary farm conditions.

The general purpose American breeds are the good surrounding breeds, the very best of which are the Rhode Island Red, the White Wyandottes and Rhode Island Reds. It is generally easier to obtain a good supply of winter eggs from these breeds under ordinary farm conditions, than from some other breeds, good as they may be, under somewhat different conditions, than can be provided by most of us on the farm.

Our breeding pen or pens should be mated up at once, the very best hens (true) to type, (one year or two year olds) being mated with the very best male birds or birds we can obtain, and these breeding birds should be given the very best available conditions, including as much range as possible. In the selection made, health and vigor should be a first consideration, and these should be maintained by good surroundings referred to and good healthful rations.

In the case of breeding birds, it must be kept in mind that the quality of the eggs produced is of very great importance and having selected the birds and having seen to it that their environment is what it should be, these favorable conditions must be supported by good methods of feeding.

The whole grain should be fed in deep litter to induce plenty of exercise. Grit, shell, charcoal, an abundance of green food, pure water and sour milk or buttermilk, should be kept before the birds at all times. Some animal protein is necessary in the ration and if it is not possible to keep a plentiful supply of sour milk or buttermilk before the birds, a good quality of lean meat or commercial beef scraps should be supplied, say about 5 per cent. of commercial beef scraps mixed with the dry mash or about an equal percentage of lean meat fed to the birds.

The free use of green cut food at breeding time is not only advisable and perhaps it is safer to avoid its use at this season for the breeding stock. The right birds managed as described above and housed in a light, airy, well ventilated house, kept clean and free from vermin should produce high fertility and likely to produce strong, constitutionally healthy chicks which should be easily reared to maturity if properly cared for. It is advisable to have the birds mated up for about two weeks before saving the eggs for hatching, also special care in the selection and keeping of the eggs previous to incubation is necessary.

In the selection of eggs for hatching, uniformity should be taken into consideration as regards size, shape and color. The eggs should be type and color for the breed of bird, of medium size and good shell texture, should be selected. Small eggs, very large eggs, eggs having rough thin shells, all abnormally shaped eggs, dirty eggs, and cracked eggs should be discarded for hatching purposes.

Frequent gatherings of the eggs should be made from the poultry house in order to prevent incubation being started by any hens that might become broody, or to prevent chilling in cold weather. The eggs should be carefully selected as gathered, placed in a temperature not exceeding 50 deg. Fahrenheit, if possible. The eggs should be incubated as soon as possible after being laid, but if keeping them for some little time is unavoidable, it is perhaps advisable to turn them regularly once a day. These directions being carefully followed, it will be possible to obtain satisfactory hatches from eggs that have been kept even as long as three weeks.

The careful following out of some such system as is here advocated will result in a great saving of expense in connection with the season's hatching operations, by reason of the fact that a larger number of good strong chicks will be hatched from a much smaller number of eggs than if haphazard methods are followed.

It is advisable to hatch as early as possible after the end of March, because the early pullets are the valuable birds and it is to them we must look principally for our supply of early winter eggs; and, furthermore, the April and early May eggs given correct treatment are the best and firmest eggs and are likely to give the best results.

Some hints on the management of the sitting hens and brooding and rearing of chicks will be published in good time.

SCALY LEG.

Scaly leg is a disgrace to a poultry farmer, because it is curable with very little trouble when first observed. It depreciates the value of a table fowl and annoys a sitting hen. The parasite causing scaly leg is of the same family as the mange mites of horses, cattle and other domestic animals, but the variety is gallinae. Sarcopites mutans is the correct name. Its size might be represented by a pin's head. The mite causes the mite's life is similar to that of their cousins which cause broken feather and stamping of horses in the stable at night; they cause itching and irritation, and by inflicting many minute wounds provoke an escape of serum, which is their own drink. Fowls, rub and sometimes peck, and the rubbing of the scales causes the mites to be distributed, as they can live in the dirt of the hen house and await their opportunity to fasten on to new hosts or previously clean birds.

At the attack generally commences low down on the leg or between the toes. It is easy to see how the perch becomes the most frequent means of infection when a single member of the flock is affected.

Treatment.—This is divided into three, if the work is to be done well. First, the mite should be destroyed to get at the parasites, next to destroy them, and lastly to restore the skin. Any strong alkaline solution will swell up the scales as well as the normal cuticle. A strong solution of extract of soap answers very well, or the simple process, in the case of leg mites, is to rub the scales with plastering on thickly a layer of soft soap.

When this has opened the scabs and skin generally, the patient can be held in warm water up to the hocks, or higher, while the soap is washed out. There are many remedies which will kill the mites, but the most reliable is a half an ounce of soap and half a pint of hot water can be made into an indifferent emulsion by dissolving the soap in the water, and shaking it up with the paraffin. This stock remedy is to be mixed with nine times the amount of water, and the mixture recommended for use. Another remedy, sometimes resorted to as "stink baths" is made by boiling together one ounce of slaked lime, four or five ounces of sulphur, and one gallon of water. This is very effective at the time, but it is useless for a second application. It is a cheap remedy, but, under some circumstances, a second bath must be prepared. Any of the coal tar derivatives, sold under proprietary names, can be used at five per cent. strength in water. A second treatment at the end of four or five days is advisable.

In making one male to eight or ten females in the Leghorn class is sufficient. In heavier breeds one to twelve or fifteen is better. Do not mate up the birds until about two weeks before the eggs are wanted for hatching and then break up the matings as soon as the eggs are no longer wanted for this purpose. By mating up only a short time before the eggs are wanted for hatching a stronger germ will be secured. When breeding from yearling hens, stronger stock will also be assured if they are given a rest after the moult in the fall and only pullets are available, selection until January. This, of course, relates to the yearling hens from the eggs of which we wish to hatch the next season's layers—birds we desire to make superior in form and vitality to their progenitors. If the poultry breeding has been begun with pullets and only pullets are available, select for the breeders only those that are well developed, and birds of uniform size and shape. By doing so a more uniform lot of youngsters can be secured and progress will be made from the start.

KEEP AN EYE ON THE SETTING HEN

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

Dusting.—At the time of setting it is very necessary to dust the hen thoroughly with good commercial insect powder. Some hens may be so badly infested with lice that they will leave their nests. To disinfect the hen take her by the feet, holding her head downwards, and sprinkle the powder well into her feathers, then rub the powder around the points. Dust the hen again about ten days after setting, and for a third time just before the hatch comes off.

Feeding.—The sitting hen should be fed regularly every day. Where a number of hens are sitting together they may be left together, but they should be watched carefully to see that each hen returns to her proper nest.

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

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

THE LOCATION OF THE INCUBATOR

The best place in which to operate an incubator is in a basement or cellar, where the air is somewhat moist, yet circulates freely, and where the temperature is really uniform. Some of the best machines which are on the market, however, may be operated successfully almost anywhere. The machine should be set level, otherwise the incubating chamber will not be heated uniformly. Next the lamp should be lighted, the incubator chamber brought to the proper temperature, and the regulator adjusted so as to maintain the temperature. It is always a good plan for a beginner to run the incubator two or three days before putting in the eggs so as to be sure that the regulator is working properly. After the eggs are put in the regulator should be made with great care. The degree of heat which the thermometer should register in the incubator depends somewhat upon the location of the thermometer, and the manufacturer's directions in this matter should be followed. If the thermometer is suspended near the centre of the incubating chamber so that the bulb is two inches above the level of the trays upon which the eggs rest then a temperature of 102 1/2 to 103 degrees will give a good hatch if all the conditions are favorable.

INCUBATION NOTES.

The following practical precepts may be observed advantageously:

1. When but a small number of chickens are desired, use hens for incubation; when many are desired, use incubators.

2. Use only fresh, strongly fertilized eggs, of uniform size.

3. Disinfect the nests, the incubators, and the eggs.

4. Keep the thermometer at 102 to 103 degrees.

5. Do not turn the eggs daily, except after the eighteenth day, allowing for this work about five minutes per day.

6. Use moisture in the machines during the first eighteen days only when the eggs show a too rapid evaporation of liquid contents after the eighteenth day. In the shells seem too hard and dry, moisture may be used to soften them.

7. After the eighteenth day keep a careful watch upon the thermometer, and as the heat generated by the embryos increases, reduce the flame of the lamp and entirely extinguish it, if necessary.

8. Observe, at least during the first hatch or two, the printed regulations accompanying each machine. If after this experience has taught you a better way, don't hesitate to follow the manufacturer's experience.

9. Remember that no machine, and no hen, can hatch an infertile egg, so don't find fault if the infertile eggs do not hatch.

SELL OFF THE OLD HENS

The profitable flock of poultry seldom has many old hens in it. This is due to the fact that hens as a rule give better service while in the pullet or yearling stage. A pullet which begins to lay early and regularly is worth several hens that are over two years' old. This is not always true, of course, but it is usually so. Only proves the rule. There is individuality in hens as with all other farm stock, and a poor pullet will not equal a good hen. Where necessary, selection will have to be practiced. Only those who are breeding fancy or high priced birds can afford to retain all the birds, regardless of age. The farmer who wants utility birds with lots of winter eggs will have to keep his birds moving to market as soon as their usefulness declines. Eggs are scarce and highest in price during the winter months and it is better to retain only the best. Eggs are scarce and highest in price during the winter months and it is better to retain only the best. Eggs are scarce and highest in price during the winter months and it is better to retain only the best.

THE DAIRY

HARD BUTTER

Butter is naturally hard in Winter and soft in Summer, but when made under careful supervision butter need not be hard in either season. If it is exposed to extremes of heat or cold. Butter which is exceedingly hard is essentially a Winter trouble, and this may be remedied to a great extent by giving attention to various details in the production of the milk and manufacture of the butter. It is, of course, necessary that the butter when made should be stored in a suitable place until consumed. The nature of the foods given to the cows will have some effect.

When cows are stale in milk the cream is difficult to churn and the butter is rather hard. This is due to the fact that towards the end of the lactation period the fat globules are very small, which makes it difficult to collect them together in the churn. The fat is also of a different nature, as it contains a much higher percentage of the fats which are solid at a high temperature. At the beginning of the lactation period the fats which are liquid at fairly low temperatures, are in predominance in the milk fat. Butter fat consists of a number of fats with different melting points. On the other hand, the butterfat which is produced at regular intervals apart, the cream will be more churnable, and the butter is not so likely to be too hard at one time or too soft at other times.

The rations of the cows consist of roots grown on the farm and purchased concentrated foods. The nature of the foods affects the hardness of the butter made from the milk. The foods grown on the farm should be best suited for the purpose. With regard to purchased foods, the kinds used will have a very largely on the market prices. The following points should be taken into consideration: Straw, beans, peas, mangels and cotton cakes tend to make the butter hard, so that if these feeds constitute the chief portion of the cow's rations, the trouble of hard butter will be experienced. When linseed cake, cabbage, hay and oats, etc., are the chief foods, the butter will be soft. The best butter is obtainable when the cow's rations are carefully blended to suit the requirements for which the milk is produced.

In the process of manufacture suitable temperatures must be employed for churning the cream and washing

the butter grains. Both the washing water and the brine must be as warm as possible without causing any injury to the butter during the cool weather. In Summer it is, of course, necessary to have the washing water and brine as low as can be got under ordinary circumstances. In cold weather the butter on leaving the churn should be fairly soft, but not too soft and sticky so that it cannot be worked. If the fat is naturally hard, and the butter has got too cold in the washing, and bringing it will be crumbly, which prevents proper working. When the butter grains are of the right degree of softness they should be worked and quickly made up, so as to be exposed to the cold air of the dairy for longer, than is necessary. As water helps to keep butter soft, there should be a little more water left in the butter in the Winter than is usual in warm weather.

COW'S INDIVIDUALITY.

It is still possible to find dairymen who never dig deeper than the surface knowledge of the whole herd giving so much milk, counting simply the total weight sent to the factory one day, or per month, or again simply the average yield per cow for the factory season.

A plain fact that cannot be impressed too strongly is that cows have individuality; people have personality. What makes two cows yield quite different weights of milk and fat when all conditions are practically equal? Even supposing a cow's interior economy were made visible and luminous, has any man the requisite knowledge to fathom all the mysteries of milk manufacture?

We do know this, the yield of milk and its percentage of fat are apt to vary from day to day most strangely. The first half of the milk drawn may not contain more than half as much fat as the latter half; the cow may have some slight sickness; some of her delicate nervous functions may be deranged temporarily; extreme weather, undue exposure, excitement, may all influence the yield of milk and the test. Hence it is clear that the sensible way to judge a cow's performance is not by any one test or weight, but rather on her total yield for the season. A cold meter of fact "average" does not give necessary information, cows have individuality which is worth studying so that they may repay their owners for intelligent handling. If you are not already testing each cow you own, write the dairy division, Ottawa, for forms for recording milk yields and feed.

Do Not Feed More Grain Than is Cleaned up Readily.

At the time the calf is changed from whole to skimmed milk, it should be taught to eat grain. These two should begin together. The best way to get the calf to begin eating grain is to place a little grain in its mouth after it has drunk its milk. It will like the taste of grain and will soon begin to eat without assistance. If the grain is placed in a box where it can get at it. Do not mix grain with the milk as the grains should be chewed and acted on by the saliva. If the grain is mixed with the milk, the calf swallows it and does not chew it, which causes indigestion.

When the calf eats grain readily it should be fed no more than it will clean up readily. The appetite the calf shows is the best guide as to how much should be fed. The first two or three weeks the calf will eat up about one pound of grain daily. A pound a day will be all the grain a calf will need from the time it is two months old until four or five months old.

As the skim milk is deficient in fatty material grain must be supplied to make up the deficiency. Corn or alfalfa may be used. A pound of alfalfa is the most suitable and handy food. Oil meal should not be used as it is very expensive and it is not as good as corn or kafir and where these are fed there is no need for oil meal. Corn chop is better than alfalfa. When the calf gets to eat grain, when the calf gets to eat grain, kafir or shelled corn can be fed.

Hay should be kept before the calf by the time it is two weeks old. I have seen them eat a very little at an earlier age. Even when the calf is fed to eat grain by keeping plenty of nice, clean, bright hay where they can always get it. Prairie or timothy hay is better for young calves than clover or alfalfa. Bright oats straw is good. After ten weeks of age the calves will do better on alfalfa and timothy. If alfalfa is used as too sudden change will cause scours and throw them off their feed. If alfalfa hay is not to be had use clover or cowpea hay. If the calf runs on good pasture no hay will be needed.

Clean, fresh, pure water should be always on hand. The calf will drink a great deal of water if it can get it, even if it does drink fifteen or twenty pounds of milk each day. Water is the cheapest necessity of calf production and should not be the scarcest.

After the calf is weaned from the milk, the grass that is left in the field so as to still supply the system of the calf with all the ingredients required to build its system. The ration must furnish muscle and bone forming foods so that there will be no lack, now that the milk is stopped. If alfalfa, clover or cowpea hay is fed the calf will do very well with corn alone as the grain ration. If mixed, prairie, or timothy hay, oat straw, or corn fodder, are fed, bran, linseed oil meal, cotton seed meal and corn should be added to the ration. If the heifers are stunted when they are weaned they will not grow into undersized animals.

If possible to keep the calves in a separate pen the attendant will find that they will do better. A pen three by five feet is plenty large enough until the calf is four months old. Calves should be arranged so that they can see each other and cause them to freeze in cold weather. When one calf gets the scours the trouble can be located immediately. Each calf can be given individual attention and each calf can be fed as the barn can be arranged so that the calves should be kept on the south side as it is warmer and more sunshine is to be had. The calf stable should always be kept clean and have plenty of sunshine. Sunshine is the best disinfectant in the world and is much the cheapest.—J. W.

RAISING CALVES BY HAND

The writer's experience is that the sooner the calf is taken from its mother the easier it is to wean. We all know what difficulties the farmer is likely to experience when he tries to wean a calf that has been allowed to get all its nourishment from its mother for five or six weeks. When but three days old the calf is removed from its mother and fed by hand, when removed at this tender age little difficulty will be experienced in teaching the calf to drink from a bucket. The mother also will worry much less if the calf is removed when but a few days old.

Whole milk is fed in clean pails three times a day, the calf being given all it will consume at a feeding. When about two weeks old a little skim milk is added, and the quantity of this is gradually increased until the calf is on a diet of skim milk, altogether.

My meadows need some fertilizer.

(Continued on page eleven)

When I spread manure upon the grass land with a fork the grass under the bunches was killed. I found it worse than useless to attempt to fertilize my meadows in this manner. Everything summed up, I was in a quandary.

"After my brother persuaded me to buy a spreader and to handle my supply of fertilizer intelligently, things began to improve. My expense for hired help was cut down. Two men could accomplish as much with the aid of the spreader, as four or five could accomplish with the wagon and fork. The manure was distributed evenly. Every square foot of ground received its share of fertilizer.

"I was able to fertilize my grass and alfalfa meadows successfully. Consequently hay crops were fully 20 per cent. better than preceding ones had been. I get excellent results by applying the manure during the Winter months upon ground which was plowed during the late Summer or Fall. The richness from the manure follows the moisture down into the soil, where it will be immediately available for growing crops the following spring.

"The yield of all kinds of grain upon my land per acre has increased since I began to apply manure evenly as a top dressing. All the available richness of the manure goes into the soil where the roots of growing plants can reach it. In my opinion, a manure spreader and plow are the best tools to produce manure, will bring success to the land owner.—C. W. K.

GRAIN AND HAY FOR CALVES.

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Hay should be kept before the calf by the time it is two weeks old. I have seen them eat a very little at an earlier age. Even when the calf is fed to eat grain by keeping plenty of nice, clean, bright hay where they can always get it. Prairie or timothy hay is better for young calves than clover or alfalfa. Bright oats straw is good. After ten weeks of age the calves will do better on alfalfa and timothy. If alfalfa is used as too sudden change will cause scours and throw them off their feed. If alfalfa hay is not to be had use clover or cowpea hay. If the calf runs on good pasture no hay will be needed.

Clean, fresh, pure water should be always on hand. The calf will drink a great deal of water if it can get it, even if it does drink fifteen or twenty pounds of milk each day. Water is the cheapest necessity of calf production and should not be the scarcest.

After the calf is weaned from the milk, the grass that is left in the field so as to still supply the system of the calf with all the ingredients required to build its system. The ration must furnish muscle and bone forming foods so that there will be no lack, now that the milk is stopped. If alfalfa, clover or cowpea hay is fed the calf will do very well with corn alone as the grain ration. If mixed, prairie, or timothy hay, oat straw, or corn fodder, are fed, bran, linseed oil meal, cotton seed meal and corn should be added to the ration. If the heifers are stunted when they are weaned they will not grow into undersized animals.

If possible to keep the calves in a separate pen the attendant will find that they will do better. A pen