

THE FEEDING OF CALVES.

The proper feeding of a calf affords a valuable lesson in the science of feeding animals, which is well worth the study. Much is written and said on this subject which is not based on accurate knowledge, and is therefore misleading, and moreover as all mistakes in this respect are costly, so this is. It is commonly thought that a calf must have the full milk of the cow, or it cannot be healthy or vigorous; that it cannot be well reared on skimmed milk alone; and that some starchy food must be given to make up for the loss of the fat, which is taken from the milk by skimming. This is not only opposed to the practice of the best dairymen, but it is contrary to the scientific principles on which the feeding and nutrition of animals are based. An animal requires three kinds of food. One is made up of substances containing nitrogen, and these are called generally protein; the second consists of substances containing carbon and hydrogen and are called carbo-hydrates; the third is fat. But the two first are only really necessary to the healthful growth of an animal, while the third is accessory only, and may be substituted by the second. Animals are made up of fleshy, bones, and some fat which is distributed among the tissues and in the bones. But only a small quantity of the fat is indispensable to the healthful condition. And this, it is believed may be derived in as full a proportion as is necessary, from the carbo-hydrates of the food. If, however, this should be a mistake, it is known that the tissues need but such a small quantity of fat, that it may be obtained from food having but a very small supply of it, and it is never necessary to actually feed fat, unless to a fattening animal, or one from which a large product of fat is desired. And even then the larger part of the fat may be procured from the starch, and sugar of which the carbo-hydrates chiefly consist.

Now in feeding a calf we do not want fat, if the animal is to be reared for a cow. We want a healthy frame, and rather a disposition not to lay fat up in the tissues, but to get rid of it in the milk as quickly and as completely as possible, and for this purpose the skimmed milk is as perfect a food as could be desired. Skimmed milk contains on an average, and very nearly always, a standard quantity of protein, and carbo-hydrates, viz., 4 per cent of casein, and the same of sugar. A calf then getting 20 pounds of skimmed milk a day, receives 6-10 of a pound of both these foods, and a little fat which cannot be wholly taken from the milk.

With these substances the milk has abundance of the mineral matter required, to form the bones and the cartilage, which are made up of some of the nitrogen of the food and the earthy matters. It is often advised to give meal of some kind to the calf, so that the starch required may be supplied. And just here we strike the mistake above referred to, for a calf cannot be fed any better during its unweaned period, than by its mother's milk, and this has no starch in it. The calf is not adapted for feed-

ing on starch at this age. The ability to change starch into sugar is a function not as yet acquired by the young animal and consequently foods containing starch are injurious, because they cannot be digested. It is this fact which explains the extreme difficulty of rearing a calf without milk, and on any preparation of any kind of meal or grain food. But it may be done, and is done, by the use of those special calf foods prepared for this purpose and made up of albuminous matter, as linseed meal, and some kinds of meal rich in sugar, as that of the locust beans, the fruit of the honey locust which is quite rich in sugar. Such a mixed food contains the albumin which may serve in the place of the casein, being chemically of the same composition, and the sugar of which milk has a large quantity and the mineral matter which are indispensable.

It is found in practice that a food compound on this principle is sufficient to rear a calf that may be deprived of milk, until it is able to digest the common food of the older animal. But skimmed milk has all the elements of animal growth and substance in it and on this food alone as good a calf may be raised as may be wished by the most exacting dairyman. And we see why this food cannot be improved by any mixture of meal of any kind, and why on the other hand it is improper and injurious to add any thing to it during the first four weeks of the calf's life, and thereafter only in the most gradual and cautious manner.

And this explains why a calf fed on meal at this early age is so apt to suffer from diarrhea. One might as well give the young thing so much sand or sawdust, the stomach not yet being prepared to digest and assimilate starch, and to make the necessary change of this into the digestible sugar. It has been said that a calf cannot be reared on skimmed milk. But thousands of calves have been so reared, and thousands are every year. And every calf that is not intended for the butcher at the age of five or six weeks may be thus reared very cheaply and satisfactorily. There are, however, some precautions to be observed to secure the best results.

The milk must be given of the same degree of temperature as that of the cow's milk. This is necessary because cold milk will chill the stomach, as yet too weak and without a surplus of energy to warm five or six pounds of milk 30 or 40 degrees. This exaction necessarily decreases the ability of the stomach to digest the food, and this produces diarrhea, with spasmodic action of the stomach and bowels to reject the unavailable matter. The suffering of a young calf under these circumstances is extreme, and the common methods to remedy the trouble tend to make things worse. The unthinking person gives some alum to dry up the bowels, not knowing that the sole difficulty is in getting rid of their contents as quickly as possible, and that the best thing to do is to help nature by giving a gentle laxative as some olive oil, followed by some soothing gum water or well boiled linseed or oatmeal tea. Then the stomach needs rest, and after a few hours the calf may have one quart of fresh milk direct from the cow, and no more until the digestion is restored. Then the feeding may start again as at first. The same result will happen if the milk is given sour.

BOYS' and GIRLS' COLUMN

KINDNESS TO ANIMALS.

Why should we be kind to animals?

If any boy or girl ever asks this question in earnest, there are a number of answers that may be given. Let us think of a few.

The first reason should be:

Because they were made by God himself as a part of His living world, and he has given to them in lesser degree many of our own qualities. These qualities are so developed by association with people, that animals often become very sensitive. A pet dog which has been much with good people may be more capable of suffering from ill-treatment, than a boy who has been accustomed all his life to evil companions and rough ways. A special good quality of a well-cared-for pet is sympathy. Sometimes, indeed, an animal is more sympathetic than our own human relatives are. It does not ask whether we have done right or wrong, or whether we are to blame for our own troubles. It is very sorry for us, with a trace of the same pity that the best man or woman shows to one who is unhappy.

A second reason is:

Most animals and birds and insects are beautiful in color and in form. We should not mar or destroy that beauty any more than we should cut down or deface a handsome tree or a lovely plant. Beauty in the animal world is not always recognized, because people do not look with "seeing eyes."

Put your favorite dog before you and note how one tint of the furry coat shades into another; see how fine and soft and silky the hair is when it is carefully combed and brushed. When you go to the menagerie look at the colors of the different animals and count how many shades of color you can find on each one; you will then know that there are about as many as there are in the trees of an autumn forest. When you look at the birds and insects you will find most of them colored as beautifully as the sky and the flowers. On the butterfly's wing are hues as softly shaded as those of sunset clouds; and the blue of the darting dragon-fly is as brilliant as the dark blue of a violet. Then, when you think how perfectly each animal, bird and insect is colored to suit the conditions under which it lives, you have a glimpse of another beauty—the beauty of fitness.

All that is true of color is equally true of form. Those who have learned to draw and whose eyes are trained to see beauty in lines and movements, need not be told how graceful is every movement of insect, bird and animal; from the fluttering of a butterfly above a flower, to the gallop of a horse along a line of battle, from the wheeling of a sea-gull over the ocean, to the slow majestic march of an elephant across the desert.

Another reason is this:

If we are not kind to every living thing, we disobey God. When we read "Little children, love one another," "Love thy neighbor as thyself," "Love worketh no ill to his neighbor; therefore love is the fulfilling of the law," we may be sure these texts do not mean that we

are to be kind to human beings and cruel to animals. No man, woman or child who is cruel to animals can be called a Christian. Nor can such a one be trusted.

One of the quickest ways to learn the habit of being kind is to be patient and gentle to animals. Study the effects of kindness upon them and you will get some idea of its value when shown to human beings; and perhaps after a while you will realize the great beauty of Christ Himself, in whom God revealed His love.

HARD TO SUIT.

"Oh, mamma," said Mary at the breakfast table, "I don't like to eat fish with so many bones in it. I wish I could have fish with no bones in it."

"Very well," said her mother, who had become quite used to Mary's complaints and had resolved at last to teach her a lesson. "I will bring you one, then." So she came in presently, bringing Mary a large clam.

Mary could not bear the taste of clam, and so began to pout.

"I'll not eat any fish," she said, in a whining tone, "if I can't have what I want."

"This is the only fish without bones," said mamma, "and I brought you just what you called for. I will try to give you every thing you ask for to-day, and see if that will make you happy."

Mary clapped her hands at this, and was sure she should be the happiest girl in the world.

And so she was until she came to hunt her school-bag. "Oh dear!" she cried, "why could not some one know enough to make a book-bag that couldn't get lost at all and would always be in place."

She heard a sewing-machine rattling for a few minutes, and then mamma came out with Mary's cloak and it had a pocket sewed on the outside large enough to hold all her books and her slate.

"There," said mamma, "is just what you wished for. How delightful it is to have things as you want them."

But Mary didn't look so highly delighted. Her gloves went on hard, and she fretted as she tugged at them, and she began to wish that gloves didn't have provoking fingers to bother one so. Almost before she got it out mamma was ready with a pair of yarn mittens, which looked so clumsy beside the kids.

"The very thing," said mamma, as pleasantly as though she didn't guess Mary was provoked at the thought of wearing the mittens.

"Anyway," said Mary, now almost ready to cry, "it looks just as if it were going to rain. I don't see why people need to have been so much worse off than ducks or animals in the rain. Why couldn't they have been made with a waterproof covering?"

Her mamma went gravely into the hall, and, raising her school umbrella, said, "Here it is, you have only to carry it, and the ducks have to do that with theirs."

But I am sorry to say Mary was not pleased yet. But she was hard to suit, don't you think?

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