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Calf Scours

A practitioner's view of the problem

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Digestive disturbance is the most common of all the ailments of dairy calves, and is the forerunner of pneumonia and navel infection in a large proportion of the calves which develop these troubles. Digestive disturbance should lead to a suspicion of improper diet, and it is rather surprising that the factors of infection, management, and housing have so long overshadowed this factor of diet. Many calves develop scours while nursing, but improper diet is probably the chief cause of digestive disturbance even in these calves.

Under range conditions the cow produces only enough milk for the calf; the calf gets this milk in small amounts, at frequent intervals, and absolutely fresh. Under these conditions the calf gets all of the vitamins, all of the minerals, and all of the globulins (anti-bodies or immune bodies) which appear in the milk.

Incomplete Diet

Does the same hold true in the dairy barn? By no means! The dairy cow has been selected and developed for heavy production, so the calf consumes only a small portion of her milk. Therefore, the calf gets only a small portion of the vitamins, the minerals, and the globulins which this cow puts into her colostrum. Moreover, the dairy calf may be allowed to nurse at will for 24 hours or even less. After that it is fed at the convenience of the dairyman.

Under range conditions the nutritional factors did not become important until the calf was weaned at the age of 3 months or more. Under dairy farm conditions these factors are highly important from the very first day of life as a new individual. They get progressively more important, rather than less so, during the first month because the value of milk makes it economically advisable to raise the calf on milk substitutes, and we don't know, or fail to appreciate, just what we need to supply under present-day dairying conditions.

Vitamin Deficiency

The Wisconsin College of Agriculture has studied the problem in recent years and has made some discoveries that were rather shocking to many of us who have raised calves and have recommended rations for others to use in raising calves.

First of all, the calf is deficient in vitamin A when born. It has a fair amount of niacin (nicotinic acid), but this is used up rather promptly unless the calf consumes and retains adequate amounts of milk. The calf has a very good supply of ascorbic acid (vitamin C) at birth but uses this up during the first 2 or 3 days because milk is a relatively poor source of this vitamin. Colostrum contains 10 times as much vitamin A as does market milk and twice as much ascorbic acid, but the high producing cows return to the secretion of normal milk so quickly that the calf derives but little help from the dam in this respect.

When we have thought about it at all, we have been prone to think of the calf

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as a ruminant well supplied with, or capable of manufacturing from the roughage, all of the vitamins and minerals necessary. However, the rumen does not function until the calf is 3 or 4 weeks old, and then only if the calf is encouraged (or permitted) to eat bright legume hay and some oats or a grain mixture. In the meantime, where can the dairy calf get the vitamin A that the range calf gets from grass, where can it get the vitamin B which the rumen bacteria manufacture, and where can it get the vitamin C that the ruminant later can synthesize in abundance? There is no source available to it.

Because of these findings it was suggested that the supplemental feeding of vitamins A, B, and C be tried. In our experience more calves respond to additional vitamin A than to the other vitamins, or at least the response is more apparent to the feeder. In some herds vitamin B seems to be highly important, and in still others the combination of all three and the addition of vitamin D appears to be more satisfactory. The Guernsey calf particularly needs more vitamin A because it is apparently unable to utilize the carotene in the dam's milk to produce the needed quantities of the vitamin.

Nutritional Deficiency

During the past two winters we have tried to approach the problem of calf scours largely on the basis of a nutritional deficiency. Knowing the herds that have been troubled with scours in previous years, we have instituted a program of supplemental feeding of vitamin concentrates. We have used shark liver oil as a source of vitamin A (10,000 units per cc.), and we have dispensed it in bottles of varying size with 40 capsules (00) to each 30 cc. of oil. We have also included an eye dropper, so that the dairyman can fill a supply of these 00 capsules at his leisure and then give each calf one capsule at birth and one every other day for 3 weeks.

Niacin was also used by filling these 00 capsules one-third full and giving one capsule each time the oil was given. Ascorbic acid was not tried alone, but a mixture of equal parts of niacin, ascorbic acid, and irradiated yeast was tried. With this mixture a 00 capsule was filled and one was given with each capsule of oil.

The oil is less expensive than the powder in any combination, and much cheaper than any combination containing ascorbic acid. Because ascorbic acid can be absorbed from the digestive tract of the calf only during the first 10 days of life, and because it is the expensive ingredient, we have not used the powder capsules as extensively as we have the oil.

Plan for Calf Treatment

More recently we have purchased a supply of commercially packed capsules which are even more expensive, but which can be dispensed more readily. These capsules contain 5000 units of vitamin A, 500 units of vitamin D, 50 mg. of niacin, and 250 mg. of ascorbic acid. They are given at the rate of one capsule daily. We use these capsules for 10 days and then switch to another capsule which has the same formula except that ascorbic acid has been omitted.

Another plan that has been used with considerable success in a few herds of purebred cattle where calf scours has been prevalent for many years is as follows: the owner puts his new-born calf into the trunk of his car, or into a crate in his trailer or truck and brings it to our hospital where we inject 10 cc. of anti-calf scour serum and 10 cc. of some pulmonary serum. We have used both pasteurella and "pseudo-diphthericum" serum. In some herds we have accompanied this with enough sulfanilamide or sulfathiazole tablets to last 3 days.

Scours Not Eliminated

Let it not be assumed that we have done enough of this work to eliminate the treatment of calf scours from our practice. We still encounter it frequently. The type of trouble now encountered is characterized most often by diarrhea with light-colored feces. The careful dairyman will often report that before the scours appeared, the calf had watery eyes and a
sort of head cold with a runny nose and possibly a cough for a day or two. With the appearance of diarrhea, prostration is rapid, and most of the calves develop a terminal and fatal pneumonia if they are not checked within 5 or 6 days after the appearance of scours.

**Treatments**

A wide variety of treatments has been used, and some work under one set of conditions while others give better results under a different set of symptoms. In most early cases a dose of castor oil is the best way to begin the treatment. Sixty cc. will remove the offending intestinal contents and prepare a clean surface for the medicinal treatment which is to follow.

Intestinal protectants are now in order. Salol and bismuth subnitrate are the old reliable remedies. Antiseptics and anti-ferments may be in order depending upon the degree of toxemia and of gas formation present. Astringents help to reduce loss of fluids from the digestive tract, and stimulants are used when the prostration is already evident. In all of these directions the treatment is symptomatic and therefore anti-scour mixtures prescribed contain those items which the individual calf seems to need. For an antiseptic and anti-ferment we like a mixture of 8 cc. of formalin in 120 cc. of carminatone (Strasenburgh), and of this mixture we give teaspoonful doses at intervals of from 3 to 12 hours depending upon the rapidity with which response is noted. Astringent action can be secured by giving powdered alum in teaspoonful doses at 6 to 8 hour intervals, and this alone appears to be effective in some herds. The stimulant of choice is 400 cc. or more of the dam's blood, but we have used anti-calf scours serum, 100 cc. of a 50 percent dextrose solution intravenously, or 100 cc. of calcium gluconate solution. Most of the cases so treated have responded with at least a moderate degree of success.

For direct action against the bacteria which commonly show up in cases of calf scours we have also used sulfaamide medication rather freely. Sulfanilamide was handy in most instances when attention was called to a sick calf while we were doing some other work, and it has been the drug of choice in several outbreaks involving a streptococcic infection. An average calf of 80 lbs. will take 1.3 Gm. every 4 hours for 2 days, and the tapering off process will mean reducing this dosage about one-third every second day.

Sulfathiazole has worked out exceptionally well in those herds where pneumonia appears early in the course of the infection. An 80 lb. calf should receive 1 Gm. every 4 hours during the first day of treatment, then stretch the interval to 6 hours on the second day, 8 hours on the third day, and 12 hours on the fourth day.

**Neoprontosil**

Neoprontosil has also been used in calves of this type, but we have not used it extensively during the past 2 years.

Sulfaguanidine is probably a better drug than either of the preceding ones for early cases because it reduces the rate of multiplication of the bacteria in the digestive tract while it is not at all readily absorbed from the intestine. An 80 lb. calf receives 4 Gm. morning, noon, and night the first day, then 2.5 Gm. at the same intervals the second day, and 1 Gm. on the third day.

**Sulfa Drugs**

Sulfapyridine has particular value when there is pneumonia and diphtheria present. In a case of uncomplicated calf scours, sulfapyridine is probably less effective than the preceding drugs, but it does control laryngitis and calf diphtheria. An 80 lb. calf is given 2.5 Gm. as an initial dose, and then 1 Gm. morning, noon, and night for 2 days. When breathing is labored it may be advisable to give the first dose intravenously. We have not used sulfapyridine to an extent where we feel that we are in a position to judge it, but are simply adding these recommendations from other sources.

Sulfadiazine and sulfasuxadine have been favorably reported by experimental workers, but we have not tried them in our practice.