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CALFHOOD DISEASES

1.—Gastro-intestinal Diseases

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CALFHOOD disease may be divided for convenience into three main categories:

- Those affecting the gastro-intestinal tract, including diseases of an infectious nature and those arising as a result of infestation by worms (parasitism).
- Those affecting the respiratory system, including lungworms.
- Those resulting from nutritional deficiencies, especially vitamins and minerals.

GASTRO-INTESTINAL DISEASES

Undoubtedly, the most important condition affecting the young calf is the so-called “calf scours.”

All forms of calf scours are infectious in origin and must be dealt with as infectious diseases, although there are many predisposing factors which must be considered in prevention and treatment.

The nature of the feed given to the young calf is vitally important. Poor quality, coarse feed such as old hay, or straw used as bedding, is often to blame for initiating calf scours. Other predisposing factors are infrequent feeding, too frequent feeding, feeding milk products or calf starters at the wrong temperatures, and dirty, contaminated feeding buckets.

The young calf starts life as a simple-stomached animal and in the beginning is not equipped to handle any food except milk, for which nature has provided a suitable digestive apparatus. Even milk must be given with care. Nature gave us the cue when she evolved the original article in a sterile form at a constant temperature and requiring some effort to obtain.

Over-feeding is almost certainly the most important of the many feeding irregularities which are responsible for precipitating scouring diseases.

Sources of Infection

Most calf scours are caused by coliform organisms which are common inhabitants of the digestive tracts of cattle. In the more natural environment obtaining during the evolution of cattle, protection against infectious agents present in the environment of the newborn calf was almost always assured by the consumption of colostral milk soon after birth. Colostrum contains high concentrations of protective substances (antibodies). These guard against the infectious agents present in the environment of the cow during her period of pregnancy and therefore likely to invade the newborn calf. The intake of colostrum by the calf will protect the calf against these particular organisms for two or three weeks until it
is able to develop its own defence mechanisms.

The most severe type of calf scours, attended by a high death rate, occurs during the first two days of life. Usually the calf is found soon after birth, obviously dying, thoroughly chilled and profoundly weak. These infections are fulminating, that is they progress with overwhelming speed and virulence and invade not only the gastro-intestinal tract but the entire body (calf septicaemia). The navel is the most common portal of entry for these serious infections arising during the first 12 hours of life. These young, acutely-infected calves may not scour at all, so rapid is the course of the disease.

After the neonatal period and up to four or five weeks of age, diarrhoea may become the most prominent sign of ill-health. It is during this period that the nutritional abnormalities considered here are of paramount importance. The newborn calf can escape the initial overwhelming assault of infectious disease only to fall prey to a less severe but more insidious form of infection. Such calves are unthrifty, pot-bellied, grow poorly and succumb to secondary conditions, especially pneumonia.

Isolation

When a number of cows are maintained together, infectious calf scours are likely to be much more of a problem than where only one or two cows are kept. Much more virulent outbreaks of scours occur, of course, in herds where frequent replacements are made. This is because micro-organisms are being constantly introduced to which the home-bred stock have not the immunity resulting from prolonged contact. Where cow additions to a herd must occasionally be made, it is a good plan to provide isolation quarters, effectively separated physically from the main cattle areas. If proper precautions are taken, cross-infection can be largely prevented by applying this segregation principle to new arrivals for several weeks. This concept is, of course, more important when calves are bought-in for rearing, and new arrivals must not be mingled with home-bred calves.

Closed herds are almost always healthier herds than open ones as the cattle build up resistances against the common infectious agents in the environment. However, it must be borne in mind that closed herds are also more vulnerable to new infections than herds in which additions are made frequently. The closed herd, although certainly in the main the more profitable and more trouble-free herd, can undergo outbreaks of calf diseases of a most devastating nature as a result of this lack of resistance to organisms with which they have no experience.

Coliform organisms exert their main irritating effects, after an unchecked
proliferation of their numbers in the bowel, by causing a heavy loss of fluids through the bowel wall and by upsetting the salt balance of the body. The calves die as a result of dehydration, loss of mineral salts and toxaemia.

Prevention and Treatment of Common Scours

If calf scours have been persisting on a property despite careful attention to the various hygienic measures mentioned, outbreaks may stop quickly if the pregnant cows are allowed to calve in isolated clean yards or paddocks or on to fresh grass. There is no doubt that infectious agents tend to increase in areas which are used continuously for calving or even for normal stocking, particularly when occasional spelling is not practiced.

Calving under reasonably natural conditions such as in clean grassy paddocks, usually removes the newborn calf from sources of contamination and protects against infectious scours. When calves must be born indoors in inclement weather, sheds, pens, or yards must be made as clean as possible and should be as isolated as possible. It is good practice to disinfect the navel soon after birth with a suitable compound such as tincture of iodine.

The newborn calf must be allowed to have his drink of colostrum in order to get a prompt transfer of protective antibodies from the cow.

After weaning, the calf must receive regular milk or calf-starter feeding in sterile containers and at proper temperatures. Too-frequent or too-heavy feedings should be avoided. Straw, hay and coarse contaminated materials should be kept out of reach of calves. Overseas, muzzling is a common practice especially with calves that have unusual appetites. Nipple pails are also favoured as they prevent gulping of milk and force the calf to drink in a natural posture.

Calves that are scouring despite these preventive measures are best treated by stopping all feed for a day and starting again by giving only boiled water to which glucose is added. When the scouring ceases, the animal should return to full milk or calf-starter feed only gradually, fed only from sterilised utensils.

Many cases will respond quickly to this simple treatment but others may require the addition of antibiotic or other medical treatment for one or two days. There are antibacterial agents in some calf-starters but it is probably sounder practice to avoid these substances as resistance to infectious organisms is easily induced with a worsening of the situation from a herd point-of-view.

Good quality milk substitutes are of great importance in dealing with all forms of calf enteritis. Many milk substitutes have been subjected to preparative conditions which make them less than satisfactory as food, but it is possible to buy low-temperature pre-heated products which simulate natural milk in all important respects.

Another constituent of colostrum which is essential to the newborn calf is vitamin A. Vitamin A confers a considerable natural resistance to calf scours and other infectious conditions.

Many calves develop depraved appetites and consume contaminated straw or bedding, a practice almost sure to lead to digestive upsets and scouring syndromes. Calf starters must be put into hardy, clean containers sited so that the calves will be encouraged to eat them rather than contaminated rubbish. Avoid any sudden change in diet in young calves as this "stress" will always cause an unfavourable train of digestive trouble.

Paratyphoid

The persistence of infectious organisms, as significant as it is in the case of coliform organisms which cause common scours, is even greater in the case of the Salmonella group of organisms (the so-called paratyphoid bacteria). There are many species of paratyphoid organisms, some of considerable virulence, and they are often introduced by carrier cows. Whilst the coliforms may persist for 4-5 weeks in spelled calf sheds and yards Salmonellas live for much longer periods, at times for more than a year, under dry, dusty conditions.

Once premises are contaminated, it may be impossible to prevent occasional, and even more frequent, losses unless the sheds and yards and all other areas frequented by cattle are disinfected and depopulated for long periods.
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Broad spectrum antibiotics or nitrofurans are useful in the treatment of Salmonella infection and it may be advisable to administer a suitable antibacterial agent to all bought-in calves on arrival at rearing premises.

The calves should be kept in isolation quarters during this course of treatment.

Calf-herd paratyphoid infections which persist in spite of the use of routine hygienic and therapeutic measures may be overcome by the employment of an autogenous vaccine, that is a vaccine made from the strains of bacteria isolated from affected calves on the property. This complicated technique obviously cannot be carried out except by, or with, professional assistance and advice.

**OTHER GASTRO-INTESTINAL INFECTIONS**

**Clostridial Infections**

A severe form of enteritis, which has been reported from various countries and which is characterised by bloody scours and very rapid prostration and death, is caused by an organism closely related to the one causing enterotoxaemia in sheep, that is, *Clostridium welchii*.

We have seen a clinical condition identical to enterotoxaemia in calves of all ages, in Western Australia. We have succeeded only once or twice in isolating the causative organism by bacteriological means but have never been able to type out the strain.

This infection is always associated with over-eating, especially of energy-rich starchy foods, and so may appear suddenly in large well-grown calves with good appetites. Effective vaccines are available provided the Clostridial type is known.

**Coccidiosis**

Another condition which might arise when a number of young calves are kept under crowded damp conditions is coccidiosis. This infection is likely to persist where contaminated ground feed such as straw is eaten. The disease is acute and is characterised also by a bloody scour of rapid onset and often by a high mortality rate. Calves in the one to two months age group are mainly affected but coccidiosis may occur up to a year of age.

Coccidiosis may be prevented by good feeding practices, good management, good sanitation and by the avoidance of wet or damp quarters. Low level sulfonamide feeding has been of prophylactic value. Commonly employed drugs are sulphaquinoxaline and furazolidone.

**Parasitism**

Parasitism may be a real problem, especially where calves are heavily concentrated on grass paddocks used more or less continuously for rearing. Calf parasitism is most important during the first six to eight months of life; thereafter considerable resistance or immunity appears to be acquired in most cases.

One notable exception to this is infestation by the small brown stomach worms belonging to the genus *Ostertagia*. We are seeing more and more infestations with this parasite even in animals up to 12 to 18 months of age and we are coming to the conclusion that it is by far the most important worm infestation of young cattle in this State. *Ostertagia* species penetrate the wall of the fourth stomach, where they do a great deal of damage and seriously interfere with digestion and impair nutrition.

Severe scouring leading to a marked ill-thriftiness is characteristic of this infestation. It is much more serious during periods of nutritional stress such as sometimes occur in the summer months. Each condition (malnutrition and parasitism) aggravates the other, and when both are present at the same time, and unrelied by appropriate action, death will follow in several weeks even in cattle up to two or three years of age.

Fortunately, efficient treatments for calfhood parasitism are now available. Thiabendazole is one of the best and the least toxic of modern anthelmintics. Other compounds which are finding considerable favour are Mintic (which is also very active against lungworms) and organic phosphates such as Neguvon. The latter has been used with some success on properties where parasitism is more or less constantly a problem by the administration of a low level once a week in the ration. Unqualified recommendation of this kind of treatment cannot be made until more information is obtained on its effects on immunity mechanisms of the developing calf.
Regardless of the anthelmintic used, treated calves should be put onto clean spelled country, otherwise reinfestation will follow immediately.

External Parasites

Internal parasitism will often be accompanied by external parasites. Lice are the only important external parasites affecting calves in the main calf-rearing districts of south-western Australia. Washes or sprays of some of the organic phosphate compounds are proving useful in the treatment and prevention of cattle lice.

Poisoning

Calves are inquisitive animals and often venture into areas and explore objects which may be dangerous or toxic. Thus, many farmers know that surfaces painted with lead products may lead to lead poisoning, to which the calf (and cow) is especially susceptible.

Less is known, however, of the equal propensity of the calf to contact and absorb numerous other chemical substances which are being increasingly used in agriculture. Some of these which have been suspected in recent years, or have been proving to be responsible for calf mortalities or ill-health, include wood preservatives such as penta-chlor-naphthalenes, insecticides such as the chlorinated hydrocarbons and organic phosphates, heavy metals found in copper fertilisers, battery lead, arsenical dips, and many other substances.

It must also be remembered that calves have had no previous experience with many toxic plants, and may consume some of these with serious consequences. A clear example of this is the cape tulip which older animals have apparently learned to avoid. Other toxic plants such as bracken fern, are more insidious and after a longer period of consumption may cause the death of the unwary animal.
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