Bovine Genital Trichomoniasis

BY G. DIKMANS

ONLY WITHIN recent years were the wriggling micro-organisms known as trichomonads discovered to be a cause of abortion, sterility, and breeding difficulties in cattle. Prevention depends on a careful system of management, described in this article.

Bovine genital trichomoniasis is a disease of cattle characterized by difficulties in breeding, early abortions, temporary sterility, and pyometra (accumulation of pus in the uterus), without an accompanying fever.

The causative organism, technically named Trichomonas foetus, was first observed in association with genital disease of cattle by Mazzanti (5) in Italy in 1900. He found it in the genital tracts of two cows and one heifer that were slaughtered because of permanent sterility. He considered it to be the cause of the sterility and named it Trichomonas uterovaginalis vitulae. The literature contains no further reference to trichomonads in connection with genital disease of cattle until 1925, when Drescher (3) reported finding them in pure culture in a bovine fetus aborted at 7 months. This rather striking 25-year lapse was probably due to the fact that since Bang’s discovery in 1897 (2) of the organism causing infectious abortion in cattle, the idea that genital disease of cattle manifested by abortion, uterine infection, and sterility was Bang’s disease, or brucellosis, dominated the thinking of veterinarians in this field. Only when breeding troubles occurred in the demonstrated absence of Brucella abortus were they attributed to other causes, such as coital exanthema (9).

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2 Italic numbers in parentheses refer to Literature Cited, p. 610.
Drescher's report was followed by other reports of similar findings, but they did not settle the problem of the relationship of the trichomonads to genital disease of cattle. Trichomonads had previously been reported from man and various animals. Some investigators considered them harmless, others as organisms responsible for the disease processes in which they were found, while a third group appeared to be of the opinion that trichomonads were secondary invaders unable to initiate pathological conditions but able to aggravate such conditions after they had become established.

Riedmüller in 1928 (10) reported finding trichomonads in nine aborted bovine fetuses. In two of these he found the organism in pure culture, in one he found both trichomonads and Brucella abortus, and in the remaining six he found trichomonads in association with other bacterial organisms. He described and drew the trichomonad and named it Trichomonas foetus.

Experiments conducted by Riedmüller, Abelein, Witte, and Kuest, reported in papers published between 1928 and 1934, showed that (1) trichomonads were found in aborted bovine fetuses, fetal membranes, and fetal fluids, and in the uterine and vaginal secretions of animals suffering from a condition known as infectious uterine catarrh; (2) these trichomonads both when mixed with bacterial organisms and in pure cultures were able to produce abortion in experimentally infected guinea pigs and cattle; (3) trichomonads occurred in the sheaths of bulls which on clinical and other grounds could be considered as responsible for genital disease of cattle manifested by abortion, pyometra, and sterility; (4) the trichomonads could be transmitted from male to female and vice versa during coition; and (5) these manifestations of genital disease occurred in the absence of Bang's disease and coital exanthema.

In carefully controlled experiments Rees and his coworkers (6, 7, 8) in the United States were able to infect heifers and further demonstrate the ability of trichomonads to produce delayed conception, pyometra, and sterility. A bull was also infected through service with an infected heifer, and this bull was subsequently used to infect cows and heifers.
Since 1925 the disease has been reported from several different countries—Germany, France, Italy, the Netherlands, Denmark, Norway, Japan, South Africa, Argentina, Mexico, and the United States. The first report of the occurrence of the disease in the United States was made by Emmerson in 1932 (4). Since then it has been reported by various authors from different parts of the country.

The protozoan that causes the disease (fig. 1) is a one-celled microscopic organism with three threadlike whips (flagella) at the front and one at the hind end. An undulating membrane at the back extends almost the entire length of the body. When examined alive, the organism moves across the field of vision of the microscope with an undulating motion; at times it turns and twists and assumes shapes varying from pear-shaped to oval or rounded. The rapidity of its movements depends to some extent on the medium in which it is examined.

SYMPTOMS AND DIAGNOSIS

Although *Trichomonas foetus* has been reported as occurring in the vagina of virgin heifers and in the prepuce of a young bull which, so far as known, had never been used for breeding purposes, the usual mode of transmission is by coitus.

As a result of infection one of several things may happen: (1) The animal may fail to conceive; (2) conception may take place and be followed by abortion; (3) the fetus may die and instead of being expelled may become macerated, while the uterus becomes filled with a characteristic thin, grayish-white, almost odorless fluid; or (4) a normal gestation and birth may occur in spite of infection.

Animals that fail to conceive may develop a uterine infection manifested by a vaginal discharge. This discharge may be continuous, or it may be intermittent, occurring chiefly during estrual periods, which may become irregular.

Abortion due to trichomoniasis may occur at any time during the period of gestation, but it usually takes place 8 to 16 weeks after coition. There are no signs of estrum during this period. A few days before abortion there is often a vaginal discharge. At times instead of a fetus only a small quantity of whitish mucoid fluid is expelled. The abortion may pass unobserved, especially if it occurs at night, in a dark stable, or on pasture. A few days after such an abortion the animal usually comes in heat, and this is often the first indication of infection.

When the fetus becomes macerated and is not expelled, the animal generally behaves like one normally pregnant. It shows no signs of illness, but the usual outward signs normally indicating approaching parturition fail to appear. At the end of the period of gestation there is no calf, and on examination the uterus is found to be filled with the fluid described.

Inflammation of the prepuce accompanied by pus formation and discharge has been reported in recently infected bulls. On examination the preputial mucosa and penis were found to be inflamed and to contain many small nodules similar to those occurring in bulls.
affected with nodular venereal disease. In bulls the infection usually becomes chronic.

The breeding troubles mentioned very often follow the introduction into the herd of a new bull or new cow; hence the breeding histories of both the individual animals affected and of the herd are of material assistance in arriving at a correct diagnosis. Demonstration of the presence of the organism in vaginal or uterine discharges is necessary, however, to make the diagnosis complete. The immediate microscopic examination of material taken from the vagina or the sheath is the most direct method of making a diagnosis. When direct microscopic examination fails to reveal the organisms, as it frequently does, cultivating the material may prove to be of great assistance.

One method of diagnosing trichomoniasis in the bull consists in the examination, 14 to 21 days after service, of heifers which have been bred for the first time. If trichomoniasis is being transmitted by the bulls under examination, the infection in the heifers will be vaginal at that time and the organisms can usually be readily demonstrated in samples of vaginal secretions. This method has been used with good results in herds having a breeding history indicative of trichomoniasis but in which the presence of trichomonads could not be demonstrated in the older animals. The two principal advantages of the method are that infection can be detected with relative ease and that it can be ascertained with certainty which bull or bulls are infected and transmitting the infection in the herd.

A tentative diagnosis of trichomoniasis can be made on the basis of the breeding history of the herd and of the individual animals. A demonstration of the presence of *Trichomonas foetus* in the suspected animals makes the diagnosis certain. Failure to demonstrate the presence of the organism when the herd history is strongly suggestive of trichomoniasis does not mean that the disease is not present; it may simply mean that the examination was not made at the right time and should be repeated.

**TREATMENT, PREVENTION, AND CONTROL**

There is no specific medicinal treatment for infected animals, and the disease should be handled like any other form of genital infection of cattle.

Cows that abort early in the period of gestation usually recover spontaneously. Such animals should be given a period of sexual rest for about 3 months. Cows showing persistent uterine discharge should be treated for the relief of this symptom. In some cases in which the fetus dies as a result of infection but is not expelled and the uterus becomes filled with fluid, the cervix relaxes when the end of the normal period of gestation approaches and the uterine contents are discharged. In other cases the cervix remains tightly closed, and the only practical way of determining the status of the animal is by manual examination through the rectum. In these cases the uterus should be emptied and douché in the usual manner.

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3 Trichomonads have been reported as occurring in the epididymis and in the ampullae of the vasa deferentia where these enter the urethra; they have also been found in the anterior portion of the urethra.
Cows that, as a result of trichomonad infection, fail to conceive after repeated services should be given sexual rest until after two or three normal estrual cycles. They should receive such treatment as a veterinarian recommends.

Infected bulls have been considered incurable, and their destruction has been advocated as a means of eliminating sources of infection. This advice, while theoretically sound, is not always practical. Abelein (1) in 1938 described a treatment that has been used with apparent success in a few cases. It consists in injecting, under spinal anesthesia, 50 to 100 cubic centimeters of a 0.1-percent solution of trypaflavine into the urethra and rubbing a 0.5-percent trypaflavine salve into the inner surface of the prepuce. The treatment should be repeated in a week. Washing the penis of bulls infected with trichomonads with a warm 5-percent oxyquinoline sulfate solution (17) once every 8 to 10 days for a period of 3 months has also been reported as a successful method of treatment.

While the medicinal treatment of individual infected animals, whenever such treatment is necessary, is the problem of the attending veterinarian, the prevention of the disease and the handling of a herd into which it has been introduced are largely problems of management. Since the disease is spread principally by coitus, it should be quite apparent that the utmost caution should be exercised in the buying of mature animals as permanent additions to the herd. The breeding histories of all such animals, both male and female, and of the herds from which they come should be carefully examined. Bulls with poor breeding records, no matter what their blood lines may be, should not be admitted to the herd except with great caution.

Bringing cows known as hard or difficult breeders onto the premises for breeding purposes may be fraught with danger. It should be determined if possible why the animals are difficult breeders by securing information on the breeding conditions prevailing in the herd from which the animals came.

Permitting cows to be bred away from home may be equally dangerous. An animal may acquire trichomoniasis in the process and later serve as a source of infection in the home herd.

As a rule the disease is well established and a number of animals are infected before the owner or manager becomes aware of it. Since infection is spread by coitus and chronically infected bulls have been considered incurable, a practice followed in certain infected herds is advisable. This consists in restricting the use of infected bulls to cows that either have passed through an attack of the disease or have already been exposed to it. In large herds where a number of bulls are used and there is reason to believe that all of them are infected, the services of each bull can be restricted to certain groups of cows. New, uninfected bulls should be provided for cows that are definitely known not to be infected and to heifers coming of breeding age.

The few cases of trichomoniasis reported in unbred, virgin heifers have occurred in groups of heifers which had been in close contact with infected cows. The presence of trichomonad infection in these
heifers is explained on the theory that infection was acquired by
contact. There is at the present time no experimental evidence that
contact infection can occur, but in order to be on the safe side, it is
suggested that the calves and heifers in infected herds be definitely
separated from the animals known to be infected.

**RECOMMENDATIONS**

The precautions that can and should be taken by herd owners and
managers to prevent the introduction of trichomoniasis into their
herds and to minimize the effects of the disease after it has been
introduced may be summarized as follows:

1. No mature animal should be bought as a permanent addition
to the herd without a thorough investigation of its breeding record
and of the herd from which it comes.

2. No outside animals should be brought onto the premises for
breeding purposes without knowledge of their breeding history and
that of the herds from which they come.

3. Cows should not be bred outside of the herd and away from
the premises without taking similar precautions.

4. If breeding troubles and difficulties occur in the herd, a vet-
erinarian should be consulted. If after examination and consulta-
tion it is determined that the trouble is due to trichomoniasis,
breeding operations should be stopped for a time and available
records should be studied in order to determine which animals are
infected and which may reasonably be suspected of being infected.

5. The use of bulls known to be or suspected of being infected
should be restricted to cows that have undergone an attack of the
disease or have previously been exposed to infection.

6. A new bull should be provided for heifers coming to breeding
age and for the cows that have not been exposed.

**LITERATURE CITED**

1. ABELIN, R.
   1938. **BEHANDLUNG VON BULLEN MIT TRICHOMEONADEN.** Deutsche Tierärztl.
   Wehnschr. 46: [721]–724, illus.

2. BANG, B.

3. DRESCHER, [L.]
   1926. **VERWERFEN UND JUNGTIERSTERBEN BEI SCHAFEN, SCHWEINEN, ZIEGEN.**

4. EMMERSON, M. A.

5. MAZZANTI, E.

6. REES, CHARLES W.


