

With regard to infection entering the system by the mouth, some investigators consider that it is probably one of the most common means by which cattle contract the disease. The explanation of this is that an infective discharge containing great numbers of the bacilli, or disease germs, is frequently expelled from the womb of affected cattle. The infective discharges, on being expelled, are very liable to contaminate the bedding and fodder, such as hay and straw, pasture and water, which, in turn, are taken into the mouth and consumed by other pregnant cattle. The germs of the disease, being thus taken into the mouth with the feed and water, are swallowed, and pass into the bowels, from which they are absorbed and are carried by the blood throughout the system until they reach and finally locate themselves in the wall of the pregnant womb, which is their favourable place of abode. It is also claimed that the germs, in some cases, locate themselves in the udder and lymph glands, where they remain stationary for a variable period, and are given off in the milk from time to time. It is also claimed that infection of the surface of the udder and teats occurs by contamination with discharges passing down from the vulva. The surface of the udder and teats, thus contaminated, permits infection of the milk, either while the calf is sucking, or by the hands while milking. By this means it is thought that calves sometimes contract the disease from the milk and grow up infected.

With regard to infection taking place by means of the genital passage, this was formerly thought to be the only method of entrance. It was believed that the discharges from aborting cows, dropping in the stable gutters and against the stalls, infected others by direct contamination of the genitals, or by being switched by the tails of infected cows against the genitals of other pregnant cows occupying adjacent stalls. It was also contended that the infection was chiefly conveyed from female to female through the medium of the bull during service.

Due regard and consideration must always be given to each of these factors as likely means of conveying infection; also that infection frequently takes place by the mouth, through ingesting food, water, and milk, contaminated with infected discharges from aborting cattle.

Irrespective of the manner by means of which the germ may have entered the body, upon their reaching the womb of pregnant cattle they begin to operate harmfully by giving rise to a catarrhal condition, or inflammation, of its surface, and also of the contacting fetal membrane, causing a gradual separation of the placenta, which forms the nutritive medium of connection between the mother and the fetus. The disturbance of this nutritive connection usually results in causing the death of the fetus and its premature expulsion, which is termed Abortion.

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## SYMPTOMS AND COURSE OF THE DISEASE.

Abortion may take place without any special indications of its approach, and the animal may appear quite well up to the time when the fetus is being expelled.

The actual abortion may entirely escape notice if it occurs during the early stages of pregnancy, as the small fetus or embryo and the membranes are easily expelled, and the owner's suspicions are only aroused when he finds certain of the cows or heifers, considered safely in calf, to be again in season. Even when the fetus is fairly well developed during the advanced stages of pregnancy, it may be expelled without notice, and the accident is first discovered by the presence of the aborted calf and the membranes behind the cow.