1-1-1967

Non-Infectious Cattle Reproductive Problems

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This publication is designed as a teaching aid for the intensified cattle reproduction schools conducted by the Indiana Cooperative Extension Service. It is also included in the Beef and Dairy Production Handbooks for County Extension Workers. The purpose of this publication is to help the producer more clearly understand the structure, functions, and abnormalities of cattle reproductive organs.

Introduction

Calving interval and percent calf crop have a very important influence on net income. The feed and fixed costs of maintaining a non-pregnant beef cow are an economical loss. Also, a cow which does not calve, or a bull which is not capable of normal service, cannot contribute to the genetic improvement of the herd or breed.

Infertility and sterility are widely used terms. Infertility is a condition in which the reproductive ability of the bull or cow is well below average but not completely lost. Sterility means that the reproductive ability of the cow or bull is completely lost either temporarily or permanently.

Nutritional factors

Inadequate intake of any of the necessary nutrients (energy, protein, minerals, vitamins, or water) may result in lowered fertility in either the cow or bull. These problems show up as reduced calving percentages, a high rate of services per conception, weak calves at birth, lowered resistance to disease, reduced milk production, and retarded growth.

If a cow is receiving an inadequate ration during the first one-third of gestation, the cow will usually show signs of the nutritional deficiency before the fetus is affected. This is because the fetus has priority over the dam for the nutrients during this period. However, during the last one-third of pregnancy, the fetus and dam compete more equally for nutrients, and reproduction can be impaired without the cow showing extreme signs of a deficiency.

Excessive condition frequently results in low fertility or sterility in both cows and bulls and complications at calving. A common mistake of purebred beef breeders in the Midwest is maintaining breeding stock on an excessively high energy level. This is a waste of feed and lowers reproductive efficiency.

Calcium and phosphorus supplements and iodized salt should be provided at all times. Rations should be supplemented with Vitamin A and additional protein only when it does not contain sufficient amounts. The small amount of time and money needed to correct nutritional deficiencies in brood cow rations can pay big dividends. However, the value of certain feed additives, such as wheat germ oil is doubtful.
Hereditary abnormalities

Hereditary abnormalities are conditions passed genetically from parent to offspring. Some of these defects are detectable at birth, while others may not appear until later in development.

Cryptorchidism is a condition in which one or both testes remain in the abdominal cavity. The testis or testes remaining inside the body cavity do not produce normal sperm because of the high body heat. Cryptorchidism, if bilateral, results in sterility, and if unilateral (monorchidism), is usually characterized by reduced sperm cell count with some degree of fertility. Those animals with this defect, or from a line of breeding in which cryptorchidism is common, should not be used for breeding purposes.

Scrotal hernia is a condition first noticed as an enlargement of the upper part of the scrotum. This enlargement is caused by the intestines and related structures passing into the inguinal canal and scrotum. When a bull mounts a cow the weight of the intestines is thrown down against the inguinal region and an excessive amount of abdominal contents may pass into the scrotum. The testis on the side of the hernia usually is less functional due to increased pressure from the intestines and the elevated temperature resulting from the large opening into the abdominal cavity.

Defective development of the penis may result in an inability to protrude the penis from the sheath. Abnormal sheaths, and curvature or deviation of the penis may be genetically conditioned.

A thorough physical and semen examination by a veterinarian before the purchase of a bull, and annually thereafter, may help eliminate reproductive problems before they occur.

Freemartins or sterile heifers born twin with a bull, occur in about 90 percent of bovine twins of opposite sexes. In the prenatal period, the male fetus begins secreting male hormones first. If the same placental membranes are shared by the male and female fetuses, the male hormone suppresses normal development of the female calf's reproductive tract. In the freemartin the external opening of the female tract is sometimes normal, but frequently resembles the male. Generally, the vagina, uterus, and fallopian tubes are shorter than normal, and the ovaries tend to resemble immature testes.

White heifer disease occurs principally in white beef heifers in which the tubular reproductive tract has not developed completely. This term has been used as a catch-all for developmental defects. The condition can also occur in red and roan beef heifers and in other breeds. Any white beef heifer kept for breeding stock should be examined for this condition by a veterinarian, especially if she shows persistent straining accompanied by hemorrhage from the vagina after natural service.

Ovarian hypoplasia involves ovaries that fail to develop completely. Occasionally, the ovaries are nearly impossible to locate. If both ovaries are involved the entire genital tract will remain small and the heifer will not come into heat. Ovarian hypoplasia should be differentiated from ovaries which are non-functional due to hormonal imbalances or other conditions.

Almost any part or parts of the female or males reproductive tract may not fully develop or may be completely missing. Some congenital abnormalities are visually detectable, and others may be detected by detailed examination by experienced personnel. However, most abnormalities cannot be detected by any means other than slaughter, and even then, in several cases, no cause for sterility can be found.

Any visual abnormality of the reproductive organs, repeated breeding difficulty, or structural unsoundness of feet and legs should
be reason for not keeping or buying a bull or heifer for breeding purposes.

Mechanical injury

The bull may suffer bruises or lacerations on the penis or testes resulting in temporary or permanent sterility. These injuries may occur during normal service, but usually result from improper care and handling of the bull. Restriction of the breeding season, reducing the size of the breeding pasture, and removing causes of injury (such as downed fences, brush piles, and worn-out machinery) from the breeding pasture or bull pen should help prevent these injuries. However, it is important to provide ample exercise space in the bull pen. Excessive service can also lower the fertility of the bulls.

In the bull, a fractured or broken penis may occur. This injury usually occurs at breeding. The cow may go down under the weight of the bull, or the penis may be misdirected against the cow as the bull thrusts. Injured bulls will arch their back, walk stiffly, and develop a swelling just ahead of the scrotum. The sheath may become misshaped because of the swelling. If surgical treatment is undertaken early, the condition may be corrected. Injuries and diseases of the penis and sheath are common causes of the inability for normal service.

In the cow, injuries are most prone to happen at breeding and calving. Service by a large or vigorous bull, artificial insemination without proper restraint, or examination of the female reproductive tract, or artificial insemination by inexperienced personnel may cause permanent damage to the cow's tract.

Injuries or infections acquired during calving may lead to infertility problems. If parturition is normal there is no need to assist the cow. In fact, assistance too early in normal parturition may lead to serious injury to the cow. If the cow has been in labor several hours, or if the labor has been unusually severe, professional assistance should be given. Occasionally, a minor malposition will prevent delivery. However, the fetus may be severely malpositioned or may be too large for delivery through the pelvis. When this occurs a veterinarian should be contacted.

Forced extraction, using proper techniques and equipment, may result in delivery of some large calves. Nothing is gained by pulling a calf if the cow is paralyzed and the calf dies. At times a cesarean section may be needed. In all obstetrical procedures it is imperative that strict sanitation be maintained. Thorough scrubbing of the vulva and surrounding area, and the arms of the operator, with a non-irritating disinfectant, should precede any entry into the vagina. Any instruments should be thoroughly cleaned and disinfected.

If the placenta is not expelled within 48 hours after parturition, the veterinarian should be notified. Inflammation and infection of the uterus usually accompanies retention of the placenta. Early forced removal of the placenta may allow the infection to enter the bloodstream. Proper removal of the placenta and effective treatment usually allows normal conception to occur. Occasionally, a cow may become sterile due to infection or permanent damage to the reproductive tract.

Hormonal disturbances

Since each of the many steps in the reproductive process is controlled either directly or indirectly by sex hormones, the possibilities of hormonal disturbances are almost endless. Only the more common hormonal disturbances and their consequences are discussed in this publication.

Development of cystic follicles is probably due to hormonal imbalances. In this condition large cysts form on the ovary due to degeneration of the follicle. Apparently the
lack of luteinizing activity accompanies the cystic formation and, thus, the cow does not ovulate. Animals suffering from cystic ovaries may show either nymphomania or anestrus. Nymphomania is a condition in which cows are constantly in heat or have very short intervals between periods of heat. Anestrus is an absence of heat. Diagnosis in the live cow of these conditions can be made only by rectal palpation or surgery. Treatment should be under the supervision of a veterinarian.

Cows vary in the intensity of their estrous period. Although estrous is recognized in most cows, there are some which show very little or no signs of estrous. This is called quiet ovulation, or silent heat. The physiological basis of why the typical signs of estrous do not accompany ovulation is not exactly known, but it is thought to be due to a hormonal imbalance. Many so-called cases of silent heat can be detected by closer observation. When a bull runs with the herd, heat detection is not a problem unless the bull is not a sound, aggressive breeder, or if he is used under adverse breeding conditions. In artificial insemination, heat detection can pose a problem, and occasionally a surgically sterile bull or nymphomania cow are retained in the herd to show which animal is ovulating. Silent heat may still be a problem in herds using artificial insemination.

In the bull, the secretion of hormones by the pituitary gland and glands in the reproductive tract are necessary for maintaining sperm production and sexual drive. Although hormonal imbalances are not usually a problem in the bull, close observation should be made of his breeding activity so that a cessation or reduction of fertility or sexual drive can be noted.

Role of inheritance

The effects of nutrition and management on fertility are usually much more noticeable than the effects of inheritance. However, this does not mean that inheritance is not important. Aside from the genetically conditioned congenital abnormalities (such as cryptorchidism, scrotal hernias, and white heifer disease), inheritance plays another part in fertility. For instance, the tendency for cystic follicles and other hormonal imbalances may also be inherited to some extent. Breeds and lines within breeds differ in their degree of fertility. The importance of inheritance in overall reproductive efficiency is also substantiated by decreased fertility when intense inbreeding is practiced.