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THE BACTERIAL FLORA OF THE PREGNANT UTERUS

1. From 20 to 80 percent of pregnant bovine uteri have some bacteria between portions of the maternal and foetal placentas, in the uterine cavity or in the organs of foetus.
2. Many pregnant uteri are bacteriologically negative. Although this may be ideal, it apparently is not essential for a healthy gestation and parturition.
3. A careful examination of almost all placentas will show a few areas where some pathology or disease process, either acute and active or chronic and inactive, is present.
4. The organisms most commonly found are streptococci, staphylococci, and coliform bacilli.
5. Many other bacteria, molds, and viruses have been reported.
6. These organisms gain access to the uterine cavity and placenta by way of the cervix and the caudal portions of the genital tract at the time of estrum and service, are still present from the time of a previous parturition, or they may come from the blood stream of the dam and localize in the uterus.
7. During most of the gestation period in domestic animals, the uterus and uterine endometrium is under the influence of progesterone from the corpus luteum or placenta.
8. During the estrual cycle the uterus of the cow is resistant to infection at the time of estrum when under the influence of estrogens, and more susceptible to infection during the rest of the cycle when the uterus and endometrium is under the influence of progesterone.
9. It is possible that the favourable environment produced by progesterone may favour the establishment of infection in the gravid uterus.
10. The above findings may indicate to some that the presence of bacteria is of itself dangerous or harmful to the pregnancy but this is not necessarily true.
11. Slight to definite infection and evidence of disease of the placenta may be present in an apparently physiological birth.
12. In the more severe infections greater damage to the placenta and endometrium may produce maceration of the foetus, abortions, premature births, dystocia, retained placentas, septic metritis and subsequent sterility.
 - i. These latter diseases may be associated with the lowering or lack of resistance of the dam or the foetus, previously undiagnosed damage to the endometrium, and the type, pathogenicity, virulence and numbers of organisms present during the various stages of gestation.
13. Although healthy, gravid uteri frequently have some bacteria present, the healthy, non gravid uterus does not have a bacterial flora.
 - i. Infertile cows or cows that have an obvious genital disease and have failed to conceive often may have infection and endometritis of a sufficient degree to prevent conception.

MANY FACTORS INFLUENCE DURATION OF GESTATION:

1. The length of the gestation period differs between the breeds and certain hybrids.
2. In cattle and horses male foetuses are carried one to two days longer than female foetuses.
3. Male foetuses in cattle also weigh 2 to 10 lbs more than female foetuses.

4. Young cows in their first and second gestation carry foetuses one to two days less than older cows.
5. It appears that calves born during the winter or spring have slightly longer gestation periods.
6. Foals born from January through April have gestation periods about 10 days longer than foals born from May through September.
7. It has been reported that mares will occasionally have gestation periods up to 375 days in length, and rarely even up to 400 days with a live foal being produced.
8. Most studies indicated that the sire has an influence on gestation length in cattle, horse, hybrids and pigs.
 - i. They observed that the length of gestation is primarily a characteristic of the foetus and that by selection of male and female calves having a short gestation period the mean length of gestation could be probably the mean length of gestation could probably be decreased 10 days within three generations.

SHORT GESTATION PERIODS:

1. Short gestation periods are often associated with abortions and pre mature births.
2. The gestation period of twin foetuses in cattle is an average of 3 to 6 days shorter than gestation periods of single foetuses, in sheep and goats this is only 0.6 days shorter.
3. In beef cows with multiple pregnancies following the administration of PMSG the duration of pregnancy for single foetuses, twins, triplets, quadruplets and quintuplets was 280.8, 277.4, 269.2, 262.5 and 258 days, respectively.
4. Adverse disease factors influencing the health of the endometrium and placenta or infecting foetus may cause abortion or short gestation periods.
5. Besides infections these adverse influences may also include malnutrition, chronic debilitating diseases, deficiency diseases, starvation, severe stress or other conditions favouring or causing abortion.
6. A genetic involution of the corpus luteum of pregnancy associated with hyperplastic adrenal cortices resulting in abortion in inbred Angora Goats.

PROLONGED GESTATION PERIODS:

1. Prolonged gestation periods are observed in a variety of conditions in animals including:
 - i. Iodine deficiency in sows, or the administration of thiouracil to produce hypothyroidism, caused gestation periods 4 to 10 days longer than normal with poorly viable, goiterous, hairless pigs.
 - ii. Delayed parturition in sows, dogs, sheep and cows has been produced with large continued injections of progesterone or progestins. Most foetuses died in the month following a normal length of gestation and became macerated or mummified.
 - iii. Ewes consuming Veratrum californicum about the 14th day of gestation, causing severe deformities of the face and head with hypoplasia or aplasia of the hypophysis, had greatly prolonged gestation periods of up to 230 days with foetal giantism and even rupture of the pre pubic tendon.

- iv. Prolonged gestation in Karakul sheep in South Africa associated with giant foetuses has been described but the cause, possibly genetic in nature, is unknown.
- v. Vitamin A deficiency resulted in prolonging the gestation period 1 to 4 weeks.
- vi. An inbred line of sow that carried their foetuses 3 to 4 weeks overtime.
- vii. Decapitation of ovine foetuses resulted in overtime small, weak edematous lambs with adrenals one-fourth to one fifth normal size.
- viii. Liggins destroyed the pituitary glands of ovine foetuses by electrocautery at 90 to 142 days of gestation and produced prolonged gestations.
- ix. In a number of cattle breeds three types of prolonged gestations have been observed:
 - a. Prolonged gestation was associated with postmature, long-haired foetal giants in Holsteins and Ayrshires, and in other breeds in which a homozygous recessive autosomal gene was involved. The post mature foetuses had long hooves, their incisor teeth were erupted and dehydration was evident. These calves had hypoplastic adrenals. In this condition the gestation was prolonged for 20 to 90 or more days and the foetuses weighed from 130 to 200 lbs. Vaginal delivery was impossible and severe dystocia resulted unless a caesarean operation was performed early. Affected calves had hypoglycaemia and died shortly after delivery with an Addisonian-like syndrome characterized by marked adrenal insufficiency and possible anterior pituitary gland abnormalities. Following birth by caesarean section a continuous regimen of cortico-steroids was necessary to maintain the life of the calf.
 - b. Prolonged gestation is also seen associated with cretin-like, immature foetuses with cranial and central nervous system anomalies, including hydrocephalus, anencephaly, or cyclopia and short, deformed loose-jointed legs with an aplasia of the anterior pituitary gland and a degree of hairlessness. The adrenal glands may be very hypoplastic or absent. These defective foetuses may be carried 20 to over 230 days overtime, average 120 days and they are relatively small in size. Hydramnios is frequently present. If parturition commences dystocia may occur but is not a serious problem. It is seen most frequently in Guernseys, Swedish Red and White cattle and possibly Ayrshires. This anomaly is due to an autosomal recessive mode of inheritance.
 - c. Four Holstein calves with cerebral hernia, catlin mark, a slopping fore-head, a greatly reduced cranial cavity and abnormal brain, long hooves and hair, dystocia due to its excessive size after a prolonged gestation, 20 to 60 days overtime, and death before or soon after birth. In one of these calves that was autopsied the adrenals were markedly hypoplastic.

In another similar case in which the cerebellum was absent, the cerebrum was small and the pituitary gland was absent on gross examination. The calf weighed 130 pounds and was delivered by caesarean section on the 329th day of gestation.

In these last three conditions:

1. No prepartum or partum changes are observed at the time of expected parturition and the
2. Udder is undeveloped until after the foetus has been removed.
3. Parturition does not occur until the foetus dies in utero.
4. As pointed out by Holm no bonafide prolonged gestation in a cow has ever produced a morphological or metabolically normal calf.
5. Aplastic, hypoplastic or damaged pituitary glands of the foetuses result in prolonged gestation.