



Freemartins

Freemartinism occurs when a heifer born with a male twin is exposed to masculinising hormones during gestation.

Pathogenesis

In utero there is (with infrequent exceptions) fusion of the chorions of twins leading to shared circulation which allows passage of DNA and hormones between the two. When the fetuses are the same sex this causes no problems, but, when male hormones such as testosterone and AMH (anti-mullerian hormone) pass to a heifer calf they inhibit normal development of the female reproductive system leading to infertility. There is also passage of a small amount of genetic material producing chimeric heifers which have both XX and XY chromosomes. It is estimated that only around 8% of male-female twin pregnancies do not result in freemartinism.

After birth, the male hormones are rapidly metabolised. Testosterone concentrations are the same as that found in normal heifers at birth, while AMH remains high for 7 days then decreases to be the same as normal heifers by 10-14 days.

Diagnosis

The diagnosis of freemartinism is based on physical examination, hormone assay and/or DNA analysis.

Physical examination: There are often (but not always) abnormalities in external genitalia, vaginal length and internal reproductive tract.

Anti-mullerian hormone: Serum concentrations of AMH are high for the first 7 days after birth. A serum sample is required. Same day turn-around

PCR: Identification of Y-chromosome fragments will be persistent for life. An EDTA sample is preferred. 1-2 days turn-around