



Beef Cattle Sciences

Calving School Handbook

CHAPTER 3 - The Calving Process

The fetus triggers the calving process by initiating a cascade of hormones that result in several biologic events summarized in Figure 3.1. Briefly, when the fetus grows to a stage when uterine space becomes limited, the fetus becomes stressed and produces a hormone called cortisol (“stress hormone”) that leads to several hormonal changes in the cow’s placenta, stimulating stretching of pelvic ligaments, uterine contraction, cervix dilatation, and consequent delivery. Therefore, the fetus actually determines when it will be born.

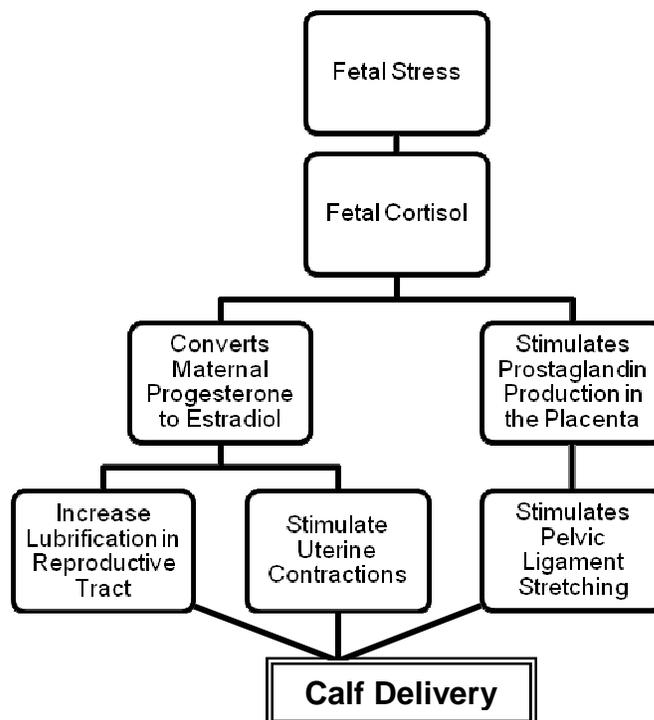


Figure 3.1. Cascade of events stimulated by fetal cortisol secretion

During the last few weeks of pregnancy (up to 6 weeks), the cow's udder starts to develop and fill with colostrum, and the vulva swells. These are the first signs that calving is near. During the last 4 to 6 days of pregnancy, the vulva swells even more and the pelvic ligaments relax causing the area between the tailhead and pin bones to become loose and sunken.

The actual calving process can be divided into 3 stages that last up to 20 hours.

Stage 1 – Preparatory stage (2 to 6 hours of duration). Fetal cortisol stimulates synthesis of maternal estradiol and, consequently, uterine contractions. As pressure inside the uterus increases, the fetus rotates so the front feet and head are positioned to the posterior of the cow (Figure 3.2). If the fetus positions itself incorrectly, dystocia (difficult birth) may occur. Uterine contractions become more frequent and begin to push the fetus toward the cervix, which starts to dilate and allows the fetus to enter the birth canal (Figure 3.2).

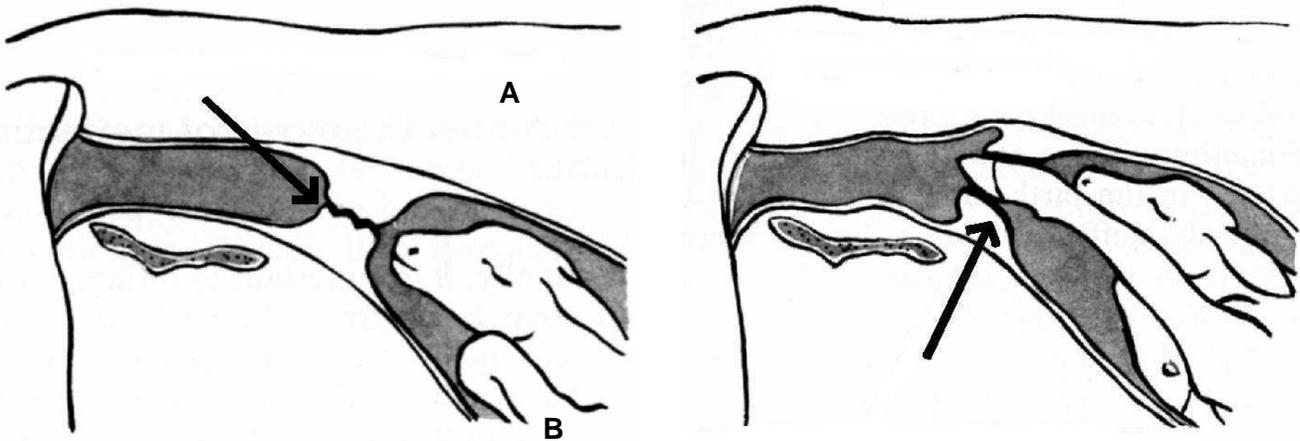


Figure 3.2. The cervix is closed at the beginning of stage 1 (A), but begins to dilate throughout this stage, allowing the fetus to enter the birth canal (B).

During stage 1, cows typically show signs of discomfort due to the contractions. You may notice restlessness, arching the back, straining slightly and kicking at the belly. Cows may separate themselves from the rest of the herd, and also urinate frequently. However, cows are still alert and fully aware of their surroundings, and may eat, drink, and behave normally. The end of stage 1 is typically marked by expulsion of the water bag (Figure 3.3), which is the most external of the fetal membranes.

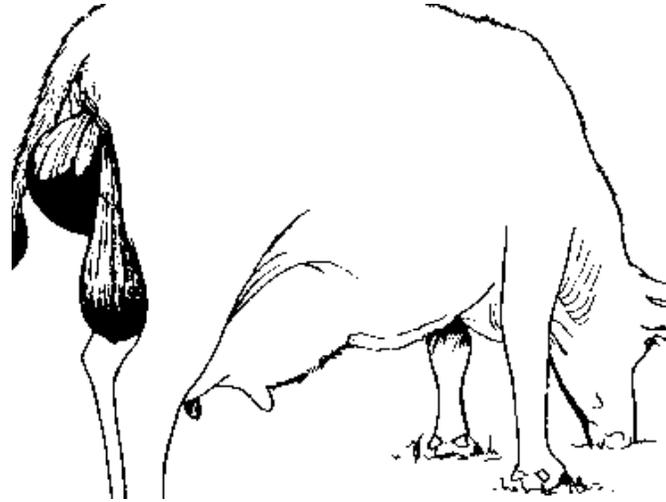


Figure 3.3. Water bag expelled, indicating the end of the stage 1.

Stage 2 – Fetal expulsion (60 to 120 minutes of duration). Maternal estradiol stimulates mucus production by the cervix and vagina, which, together with placental fluids, thoroughly lubricates the birth canal to facilitate the delivery process. As the fetus comes into the birth canal, it puts pressure on the cervix and induces a natural reflex in the cow to push, resulting in visible abdominal contractions that further aid in fetus expulsion. The combined contractions of the uterus and the abdomen stimulate the feet and head of the fetus to progress through the birth canal and put pressure on the placenta, reaching a certain level where it ruptures. Placental fluids are then released and further help in lubricating the birth canal. Contractions continue to strengthen, and cows may lie down to cope with the pain. Cow behavior may also change during this stage, as she may become oblivious of her surroundings, and focused on her contractions. After rupture of the placenta the birth is imminent, with the cow continuing to push and, hopefully, progressing normally through delivery (Figure 3.4).

The first part of the calf (it is not a fetus anymore!) that appears should be the front feet. After that, the abdominal contractions become even more frequent and intense. Sometimes the calving progress may slow down for a minute or two to allow the vulva to stretch. The next visible part of the calf is the nose, followed by the rest of the head, the shoulders, the chest and the rest of the calf. The order in which parts appear is important because it will indicate if there could be a malpositioned calf (see Chapter 4).

When the calf's chest is coming out, mucus may drain from the calf's mouth and nostrils because of labor contractions. This is an important process because it clears the respiratory passages for normal breathing. Within 10 minutes after the calf is born, the cow usually stands up and starts licking the calf.

The calf usually staggers onto its legs within 20 to 30 minutes, and should start nursing within 60 minutes after birth.

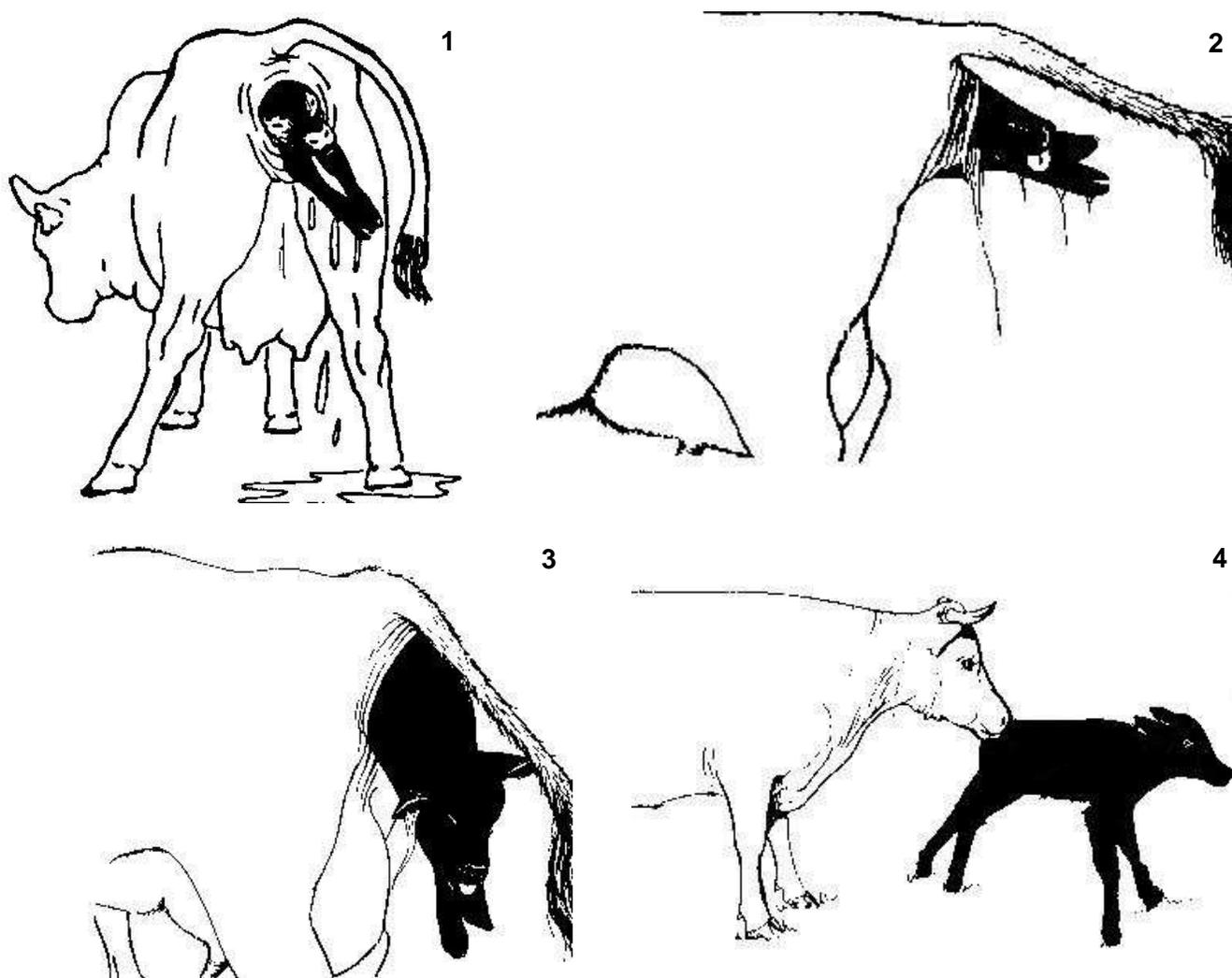


Figure 3.4. Normal calf delivery (in sequence; illustrations 1 to 4), leading to the end of the stage 2.

Stage 3 – Expulsion of the placenta (6 to 12 hours of duration). The placenta should detach from the uterus almost immediately after the calf is delivered. More specifically, the cotyledons on the placenta separate from the caruncles on the uterus (Figure 2.1) and contractions expel the placenta from the cow. Sometimes the placenta expulsion is delayed because the cow is fatigued. However, if the placenta is retained for more than 12 hours, special precautions may have to be taken (see attached articles for more information).