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STUDIES ON FETAL HEART RATE CHANGES DURING
PARTURITION IN DAIRY CATTLE

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In this study, fetal electrocardiograms (F-ECG) of six Holstein cows at full term were recorded by the non-invasive method, and fetal heart rate (F-HR) changes during parturition were analyzed.

The results were summarized as follows :

- 1) The types of F-HR changes were different largely between two stages of labor. In the first stage, when the fetus was still in the uterus, decelerations of F-HR, which occurred sporadically and lasted less than 10 seconds, and accelerations of F-HR were observed. The frequency of the occurrence of accelerations was significantly lower than that of decelerations ($P < 0.01$). When no decelerations or accelerations of F-HR were observed, the level of F-HR was almost regular, and F-HR of this case was considered a baseline heart rate. In the second stage, when the fetus entered the birth canal, F-HR fluctuated markedly, and periodic fluctuations and long-lasting decelerations were observed frequently.
- 2) It was confirmed that in the first stage, one of the primary factors to induce decelerations of F-HR was labor. But it was suggested that decelerations of F-HR might occur with other factors such as fetal movements.
- 3) It was suggested that in the second stage, periodic fluctuations and long-lasting decelerations of F-HR occurred with labor, but that other factors such as relationship between the size of the birth canal and the fetus, condition of umbilical cord, rupture of amniotic sac and posture of mother cow, etc., were related to these phenomena.
- 4) In the group of cows with normal parturition, the ranges of basal fetal and maternal heart rate (M-HR) changes were about 20 beats/min. And basal M-HR were lower than those of F-HR by 10-20 beats/min. But in two cows with distocia (one was stillbirth ; the other was apparent death), basal M-HR were higher than those of the group of cows with normal parturition, and almost the same as basal F-HR. And in the same cows with distocia, decelerations of F-HR, which lasted 70 and 720 seconds, were observed, respectively. But the relationship between these phenomena and the distocia was not clear.