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**RECTAL ULTRASONOGRAPHIC INVESTIGATIONS
OF PREGNANCY IN FARMED RED DEER (*Cervus elaphus*).**

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ABSTRACT

This study describes the ultrasonographic appearance of the non-pregnant reproductive tract, and the pregnant uterus and conceptus from 6 to 211 days after mating, with an emphasis on early pregnancy from 6 to 42 days. In addition, 13 foetal age estimation equations were computed from measurements of foetal, placental and maternal dimensions.

Mating dates were recorded for thirty seven red deer hinds two years of age or older. From immediately prior to the breeding season and at approximately weekly intervals from the commencement of mating to the end of gestation, rectal ultrasonographic scans were taken using a 5 MHz linear transducer while deer were held in a restraining device. Scans were recorded on video for later measurements and analyses.

The vagina and cervix were visible, with the lumen appearing as a continuous or intermittent white line, respectively. The non-pregnant uterus was observed in most cases and was immediately anterior to the bladder. Structures resembling the ovaries were observed only occasionally.

By seven days gestation, a 5 mm vesicle might be observed, and by day 14, oedema of uterine horns was apparent. A comma-shaped foetal mass 6 mm long, foetal membranes and formation of placentomes could be observed at day 24. The heart beat was observed at day 28 when the foetus was 10 mm long. Limb buds were observed at day 31, and by day 37 the head with nose and eyes was clearly distinguishable. Foetal movements were first observed on day 42. Elongation of the neck and the echogenicity of the ribs were observable by day 51 and 52, respectively. By day 58, the long bones were echogenic, and the individual vertebrae were clearly seen by day 59. The bladder and stomach were distinguished by day 62. From day 102, movements of foetal eyes could be observed. From day 114, the placentomes developed a mushroom shape, and some were attached to the endometrium only by a stem. After 150 days gestation, pregnancy could only be detected by viewing the presence of placentomes or foetal extremities in a fluid filled sac.

Measurements of crown-rump, head length, head diameter, nose length, eye diameter, neck diameter, chest diameter, chest depth, umbilical cord diameter, amnion

sac length and width, placentome diameter and uterine diameter, were recorded from appropriate scans and growth regression equations were computed. Age estimation equations were computed by transposing the regressions of foetal, placental or uterine dimension on age with age as the independent variable, to equations with age as the dependent variable. All equations were significant ($P < 0.001$). Each dimension was measurable over a defined period of pregnancy. The earliest dimension measurable was uterine diameter but these measurements were variable and no longer feasible after 45 days of pregnancy. Placentomes could be measured from 24 days gestation, but this dimension was also variable. The most accurate estimation of foetal age would be by measurement of the length of the amniotic sac between 37 and 56 days. Measurement of crown-rump length from 24 to 59 days, and head length from 42 to 84 days would also allow accurate estimates of foetal age. Accurate foetal ageing was not possible beyond approximately 150 days gestation.

The sensitivity of rectal ultrasonography pregnancy for testing in red deer hinds was 35% prior to 20 days, 71% between 21 and 30 days, 98% between 31 and 40 days, 100% between 41 and 130 days, and for pregnancies of 131 days or more, the sensitivity was 95%. The reliability of a positive test was 100% between 41 and 130 days.

Papers accepted or published:

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