

Diurnal changes in light intensity inside the pregnant uterus in sheep

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Abstract

Penetration of light into the pregnant sheep uterus was studied in 9 ewes, gestational ages 40 to 142 days (term 147 days). Light sensors were placed inside the pregnant horn and over the flank skin overlying the position of the uterine horn. To perform the experiments, the ewes were placed in a study cage outdoors and light sensors were connected to a luxometer. Simultaneous measurements were obtained from the intrauterine and the external sensors in the shade at noon. The amount of light detected inside the uterus increased with gestational age from two lux at 40 days to 51.1 ± 16.5 ($n=5$) lux at 142 days (0.2 and 5.4% of the amount of light detected at the maternal flank). Measurements through the 24 h were done in four pregnant ewes at 142 days gestation under natural photoperiod (13.5 light:10.5 dark). In these experiments, the intensity of intrauterine light changed through the 24 h, reflecting the changes in the intensity of the sunlight. Maximal intrauterine light values were observed at noon, corresponding to 4.7% of incident light. Small but detectable values were observed at 0900 and 1800 h. Our data show that, at mid gestation, light reaches the pregnant uterus and that, at late gestation, changes in intrauterine lighting throughout the 24 h are present reflecting the changes in external daylight. Therefore the sheep fetus is exposed to light–dark transitions at dawn and dusk, and to a peak of light at midday.