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DOPPLER TECHNIQUE IN THE ULTRASOUND EXAMINATION OF PREGNANT SHEEP

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Doppler ultrasonography is more and more often used in monitoring the course of pregnancy in sheep. Our own studies assessed the haemodynamics of blood vessels in the umbilical cord, placentomes as well as in the kidneys of fetuses and lambs in the first two weeks after delivery. The biometric parameters of the examined structures were also determined. Ultrasound examinations were carried out on pregnant Suffolk sheep using a linear probe with a frequency of up to 4 MHz and a sector probe with a frequency of up to 5 MHz. The following Doppler parameters were determined in the blood vessels of the umbilical cord, placentomes, fetal kidneys and lambs: peak systolic velocity (PSV), end diastolic velocity (EDV), PSV/EDV ratio, resistance index [RI = (PSV-EDV)/PSV] and pulsatility index [PI = (PSV-EDV)/mean velocity]. Ultrasound biometric measurements of the examined structures were carried out using the B mode. The obtained results were further submitted for statistical analysis. Statistical analyses were conducted using the STATISTICA version 13.3, Stat Soft, Poland. The conducted studies have shown that morphometric changes in the umbilical cord are related to changes in the hemodynamics of the umbilical artery. The obtained results indicate also that both the location of the arterial vessel in the placental-umbilical circulation and the gestational age have a significant impact on hemodynamic parameters. The results also provide new insight into blood flow in caruncular and cotyledonary arteries, which will contribute to a more holistic understanding of hemodynamic changes in sheep’s placenta. The results concerning the kidneys presented in this work may be useful in establishing reference values of biometric and haemodynamic ultrasound parameters of these organs in sheep in the prenatal and neonatal period.

Keywords: doppler, ultrasonography, sheep