

DETERMINATION OF EARLY PREGNANCY IN EWES UTILIZING TRANSABDOMINAL ULTRASONOGRAPHY.

By

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SUMMARY

Transabdominal ultrasonography was used in ewes to determine the earliest day at which pregnancy could be detected as well as the number and viability of fetuses present. The present investigation was carried out on 7 Barki ewes during non breeding season. Induction of oestrus was performed using a progesterone releasing intravaginal sponge plus 750 i.u. PMSG at the time of sponge removal. Ewes were monitored for oestrus and naturally mated. Transabdominal ultrasonography was utilized on day 10, 35 and 100 of gestation. 3.5 - 5.0 MHZ transducer was utilized. The results indicated that 71.43% of ewes showed oestrus symptoms 62 hrs after the end of treatment. Moreover, transabdominal ultrasonography on day 10 post oestrus clearly demonstrated and facilitated counting the number of corpora lutea and unovulated follicles present on the ovaries of responded ewes. In addition, on day 35 after mating, pregnancy was diagnosed in 3 out of 5 ewes (60%) one of them was twin pregnancy. Also, the viability and fetal heart beat can be detected by day 35 of pregnancy. On day 100 of

pregnancy placentomes and viability of fetuses can be easily detected, however, it is difficult to predict twin pregnancy as a result of increasing fetal size. In conclusion, transabdominal ultrasonography scanning can be easily utilized for prediction of the early pregnancy diagnosis (day 35) in ewes and for detection the viability of fetuses during late stage of gestation.

INTRODUCTION

The profitability of sheep farming could be improved if a simple and reliable technique was available for the detection of pregnancy, this would enable prompt - re - mating or culling or breeding of non-pregnant ewes, more economically use of supplementary feeding in late gestation and more accurate planing of nutrition (Meredilts and Madani, 1980). In addition, pregnancy diagnosis is particularly valuable in flocks where service recording is not possible.

Real-time ultrasound techniques have been used to diagnose pregnancy in a wide variety of animal

species. The diagnosis of pregnancy can be made by imaging uterine fluid and the amniotic vesicle or embryo in early pregnancy, later in gestation, the fetus or characteristic structures such as placentomes are imaged readily (Reichle and Haibel., 1991). The accuracies of diagnosing of pregnancy and determining fetal membranes between days 50 and 100 of gestation were more than 99% (White et al., 1984). An additional advantage of ultrasound scanning is the detection of fetal death or abnormalities (Aiumlamai et al., 1992), age of fetuses and follow up of the growth and development of internal organs.

The present experiment was undertaken to apply the real - time transabdominal ultrasonography for prediction of the pregnancy diagnosis and counting fetuses number in ewes.

MATERIAL AND METHODS

Animals under investigation

The present experiment was carried out on 7 Barki ewes raised in the experimental farm of the Animal Reproduction Research Institute. Ewes were kept in an open housing system with feed and water available and libitum.

Experimental design:

The present experiment was performed during non breeding season, (Aug., 1994), all ewes were non pregnant. Ewes received progesterone releasing intravaginal sponge (Veramix, Upjohn, USA) containing 60 mg medroxy progesterone acetate (MAP), sponge was left in place for 12

days. Immediately after sponge removal, 75 PMSG (Folligon, Intervet, the Netherlands) injected i. m. Ewes were monitored for oestrus and naturally inseminated during oestrus. Time to oestrus and number of responded ewes recorded.

Ultrasonographic scanning

Real-time transabdominal ultrasound scanning using 3.5 - 5.0 MHZ (Scanner 480 Vet., Medical, Meastricht the Netherlands) Transabdominal ultrasound scanning was performed 10 days after mating, on days 35 to 100 of gestation. The ewes were restrained during scanning while they were sitting down with the hind limbs extended horizontally. Wool was removed from the lower belly area and skin was coated bilaterally with echogel. The results of each ultrasound scan were recorded in terms of ovarian findings, number of fetuses, the fetal viability. After the ovaries or fetal structures were located, symmetrical images of the fetal structures were frozen and measured with internal electronic calipers.

RESULTS

In the present experiment 71.43% (5 out of 7 ewes) of the treated ewes showed oestrus symptoms after 62.40 ± 5.26 hr (range 48 to 72 hr) after the end of treatment.

Real-time transabdominal ultrasound scanning on day 10 post mating clearly illustrated the ovarian structures in 3 out of the responded ewes. The right ovary of one ewe showed 3 CL and

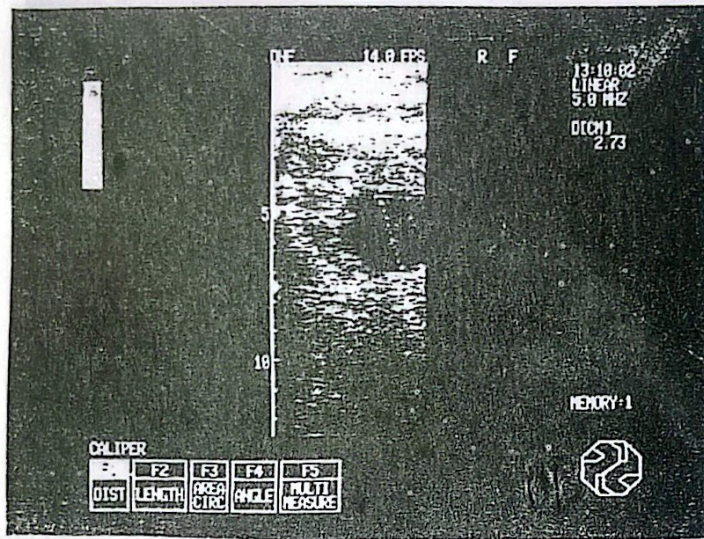


Fig. 1: Transabdominal ultrasound scanning showing right ovary of a treated ewe with 3 CL (arrows) and 3 follicles with 2.73 cm diameter (1) on day 10 post oestrus.

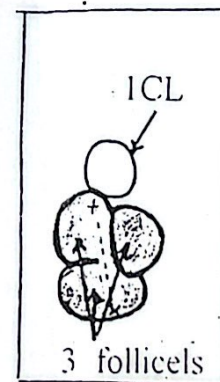
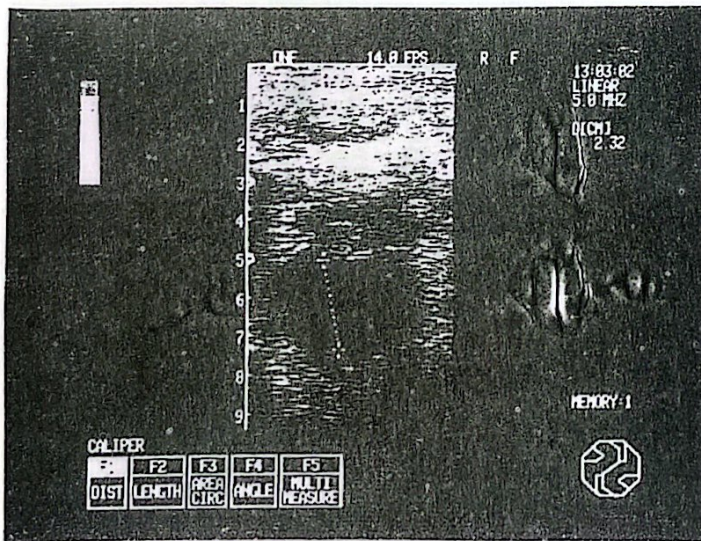


Fig. 2: Transabdominal ultrasound for a responded ewe demonstrating ICL (arrows) and 3 follicles with 2.32 cm diameter (1) on day 10 post oestrus.

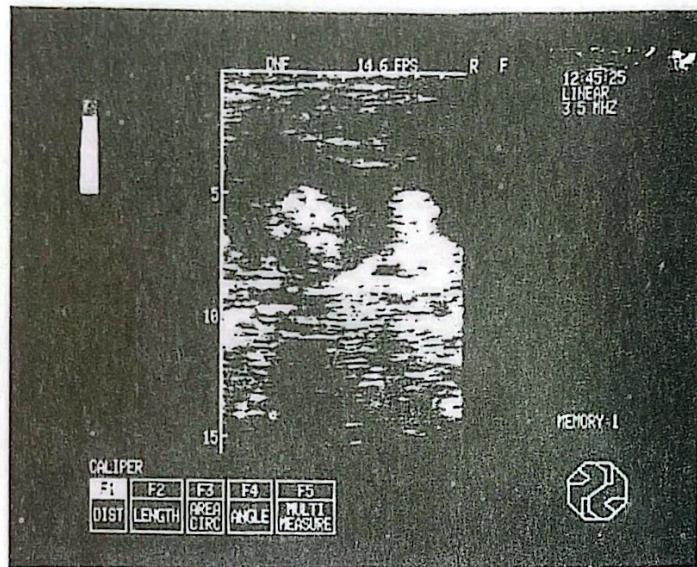


Fig. 3: Ultrasonography for a pregnant ewe on day 35 of pregnancy showing twins (arrows).

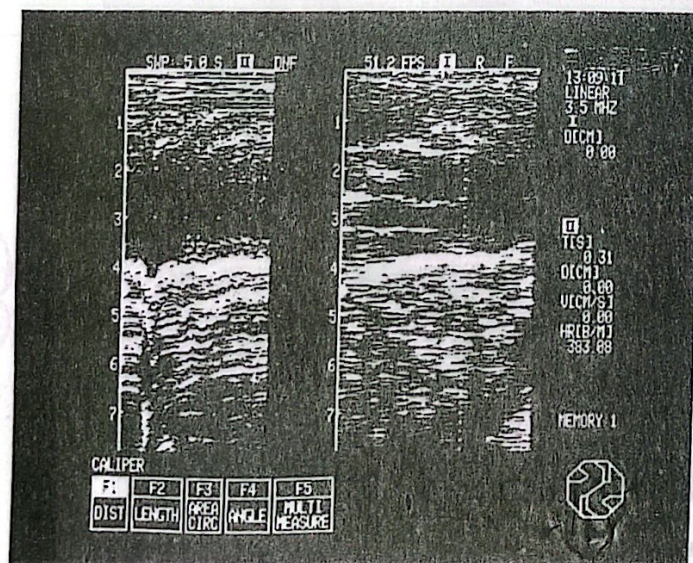


Fig. 4: Ultrasound scanning showing (A) a longitudinal section in the fetal heart (I) and (B) ECG for fetus (II).

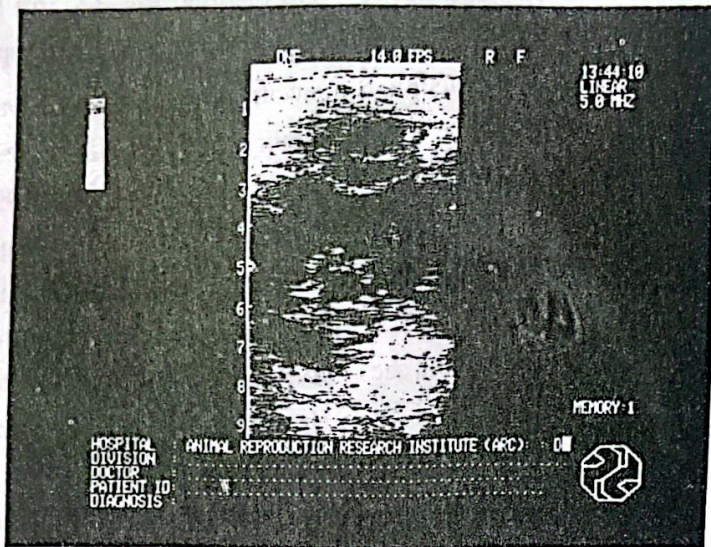


Fig. 5: Ultrasound scanning for a pregnant showing fetal membrane (arrows) and placentomes (1) on day 100 of pregnancy.

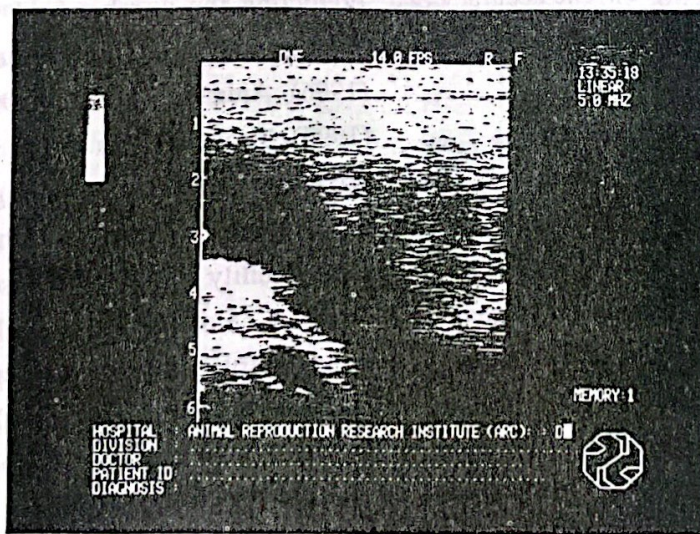


Fig. 6: Ultrasound scanning for a pregnant ewe illustrating gravid uterus with fetal structures on day 100 of pregnancy.

unruptured follicles with 2.37 cm diameter (Fig. 1). In another case, the ovary demonstrated one CL and 3 un-ruptured follicles of 2.32 cm diameter (Fig. 2). Measurements of very early embryonic development were less accurate due to the deep location of the uterus within the abdomen which made resolution poor using 5 MHZ frequency. Moreover, real - time ultrasonographic images of the uterus in pregnant ewes on day 35 of gestation displayed prominent circular folds and hypoechoic chambers. Within this chamber, two embryos were visualized as echogenic structures within the chorioallantoic sac (Fig. 3). Also, the embryonic heartbeat can be easily detected from day 35 (Fig. 4). In the meantime, in the present study real - time ultrasound scanning on day 35 of gestation indicated that 3 out of 5 ewes (60%) were pregnant, one of the pregnant ewes was diagnosed as carrying twin fetuses. Furthermore, on day 100 of gestation, placentomes (Fig. 5) and movement of fetuses were detected (Fig. 6). The accuracy of pregnancy diagnosis and number of fetuses was 100 % as recorded by the lambing date.

DISCUSSION

The ability to accurately determine pregnancy status and the number of embryos and corpora lutea during early gestation provides an excellent opportunity to investigate fecundity of ewes. In the present study the number of ewes which exhibited oestrus and became pregnant (60%) after induction of oestrus was somewhat lower than that previously reported by Speedy and Fizzsimons (1977) as a conception rate of 73-88%

in finn x Dorset breed. This difference attributed to breed difference (Gordon, 19) may be under the influence of season.

Transabdominal ultrasonography can pregnancy by day 28 of gestation in (Taverne et al., 1985). The accuracy predicting pregnancy and the number of embryos present increased as the gestation increased (Levy et al., (1990). In the present transabdominal ultrasonographic scanning on 10 postmating clearly demonstrated the presence of multiple corpora lutea and non ovulated follicles on the ovaries of the responded ewes. However, it is difficult to demonstrate the uterine findings using transabdominal ultrasonography as the uterus is deeply situated in the abdominal cavity. This finding is in complete agreement with that previously reported by Gearhart et al., (1984). On other hand, on day 35 of gestation transabdominal ultrasonography clearly demonstrated the percentage of pregnant ewes predicting the number and viability of fetuses. Similar results were reported by Buckrell et al. (1986), Aiumlamai et al., (1992) and Garcia et al. (1993). Those authors found that transabdominal ultrasonographic scanning indicated the presence of pregnancy as well as the number of fetuses and their viability can be diagnosed with confidence from day 35 on the basis of the imaging of fluid filled uterus, placental materials and fetal heartbeat. Moreover, on day 100 of gestation it is difficult to determine the number of fetuses rapidly with confidence. This is due to the rapid increase in fetal size. This finding is in complete agreement with White et al (1984) who found that the size of the fetuses in relation to the area of imaging becomes increasingly difficult to

determine the number of fetuses.

In conclusion, application of transabdominal ultrasonographic scanning could be used successfully as a tool for prediction of early pregnancy diagnosis and in management of twin pregnant ewes.

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